



**REGIONAL
CANCER
CENTRE**

THIRUVANANTHAPURAM

1999-2000



REGIONAL CANCER CENTRE

THIRUVANANTHAPURAM-695 011, KERALA, INDIA

REPORT OF ACTIVITIES 1999-2000

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INTRODUCTION

The Regional Cancer Centre, Trivandrum has proudly entered into the 21st Century to meet the continuing challenge of cancer. The new millennium offers new opportunities and new initiatives and we are committed to excel in all our activities. Our all round efforts in the last decade have been recognised nationally and internationally. The new patient attendance at RCC has trebled from 3000 to 10,000 per annum over the last two decades mainly due to the people's faith in our comprehensive and high quality cancer care.

As in previous years this year also we gave great accent to community cancer services and epidemiologic activities. The Early Cancer Detection Centre at Kollam is fully established. A health care institute for cancer detection and allied activities was opened at Kodungalloor. An Early Cancer Detection Centre has been started at Kozhencherry, Pathanamthitta. This will cater to the needs of the people in the foot hill region and the hilly tracts. This centre has launched a programme "Anti-tobacco revolution through schools". To begin with this programme has covered over 6000 schools during this year. In close collaboration with the Regional Cancer Association several Anti-tobacco activities were conducted. In recognition of these activities World Health Organisation, honoured us with the best anti-tobacco award in South East Asia.

An International school of colposcopy to train doctors, gynaecologists, nurses and field workers of the developing countries started functioning in this centre. We have also evolved low cost cervical cancer detection strategies.

The RCC Institute of Epidemiology, Surveillance and Preventive Oncology (RESPO) the first of its kind in India has started its programmes in earnest and received funding from the UNFPA for an "Operation Research Project on Cancer Control" in the North of Kerala. We intend to develop RESPO for rendering epidemiological and research guidance to all branches of medical services in Medical Colleges and other centres.

An international conference "Radiobiology 2000" was hosted by us in a very elegant manner. This conference was attended by more than 200 delegates including 50 from foreign countries.

Dr. R. Chidambaram, Chairman, Atomic Energy Commission and Secretary, Dept of Atomic Energy visited this centre and inaugurated the Micro Selectron HDR System and also the Simulator on 23/4/1999. Dr. Anil Kakodkar, Director & Scientist from BARC visited the Natural Background Radiation Registry and inspected the activities.

During the year under report rapid strides were made in Research activities and 115 papers were published in peer journals and 85 papers were presented in conferences and 4 candidates were awarded Ph.D.

In tune with the newer trend of Holistic Medicine this centre has started an Ayurvedic Research Unit for treatment and research on cancer under the guidance of Vaidya Balendu Prakash. It was inaugurated by His Excellency Governor Justice Sukh Dev Singh Kang on 10th January 2000.

Hon'ble Chief Minister Sri. E.K. Nayanar inaugurated the Video Endoscopy Unit and Hon'ble Health Minister Sri. A.C. Shanmughadas commissioned the Apheresis Unit in the blood bank and Hon'ble Speaker Sri. M. Vijayakumar inaugurated the Dry Chemistry Analyser Unit in RCC on 20-10-1999.

Computerisation of the centre is nearing completion and already we were able to develop and implement the patient management and information system of the entire hospital.

This report contains the activities of the various divisions and also the audited statement of accounts for the year 1999-2000.

DEPARTMENTAL ACTIVITIES

DIVISION OF RADIOTHERAPY

Dr. M Krishnan Nair	Director & Professor
Dr. F. Joseph	Dy. Director & Professor (upto 26-10-99)
Dr. B Rajan	Medical Superintendent & Professor
Dr. T Gangadevi	Addl. Professor
Dr. P G Jayaprakash	Addl. Professor
Dr. C S Rafeeka Beegum	Addl. Professor
Dr. Suresh Chandra Dutt	Assoc. Professor
Dr. S Parameswaran	Assoc. Professor
Dr. V N Bhattathiri	Assoc. Professor
Dr. Jayaprakash Madhavan	Assoc. Professor
Dr. K Ramadas	Assoc. Professor
Dr. K Ratheesan	Assoc. Professor
Dr. Thomas Koilparambil	Assoc. Professor
Dr. Francis V James	Assoc. Professor
Dr. Beela Sarah Mathew	Asst. Professor
Dr. T V Ajithkumar	Asst. Professor
Dr. Aswin Kumar	Lecturer

The division of radiation oncology lost one of its highly respected staff, Prof F. Joseph on 26.10.1999 who succumbed to cardiac illness. We pay respect to his leadership and excellent character.

This division of radiotherapy continues to be the major unit responsible for the primary care of cancer patients attending Regional Cancer Centre. There are 3 exclusive units with 16 radiotherapists. As the patient management involves multidisciplinary management with radiotherapy, surgery and chemotherapy, regular clinics of different division are being conducted. In association with various departments of Medical College, the following clinics are also conducted. Paediatric tumour board (weekly), Gynaecological tumour board (monthly), Gastroenterology tumour board (monthly), Surgery tumour board (monthly) and Clinico-pathological meeting (monthly). The staff are also actively involved in conducting clinics at peripheral centres at Karunagappally, Kozhanchery, Ernakulam, Palghat and Kannur for regular follow up of patients.

Clinical Activities

The division has taken the responsibility of 9269 new cancer patients registered at Regional Cancer Centre during 1999 - 2000. During this period there were 92685 review cases. Out of 7623 inpatient admissions, 3082 were under the care of the division. Teletherapy was used in 6500 patients and brachytherapy was used in 620 patients. Brachytherapy services included ISI (Interstitial Implants), Surface Mould treatments, Intra Luminal application for Ca. Oesophagus, Manual after loading for gynaec tumours, Selectron for gynaec tumours, Micro selectron for gynaec tumours, Micro selectron for oesophagus and Micro selectron for bronchus.

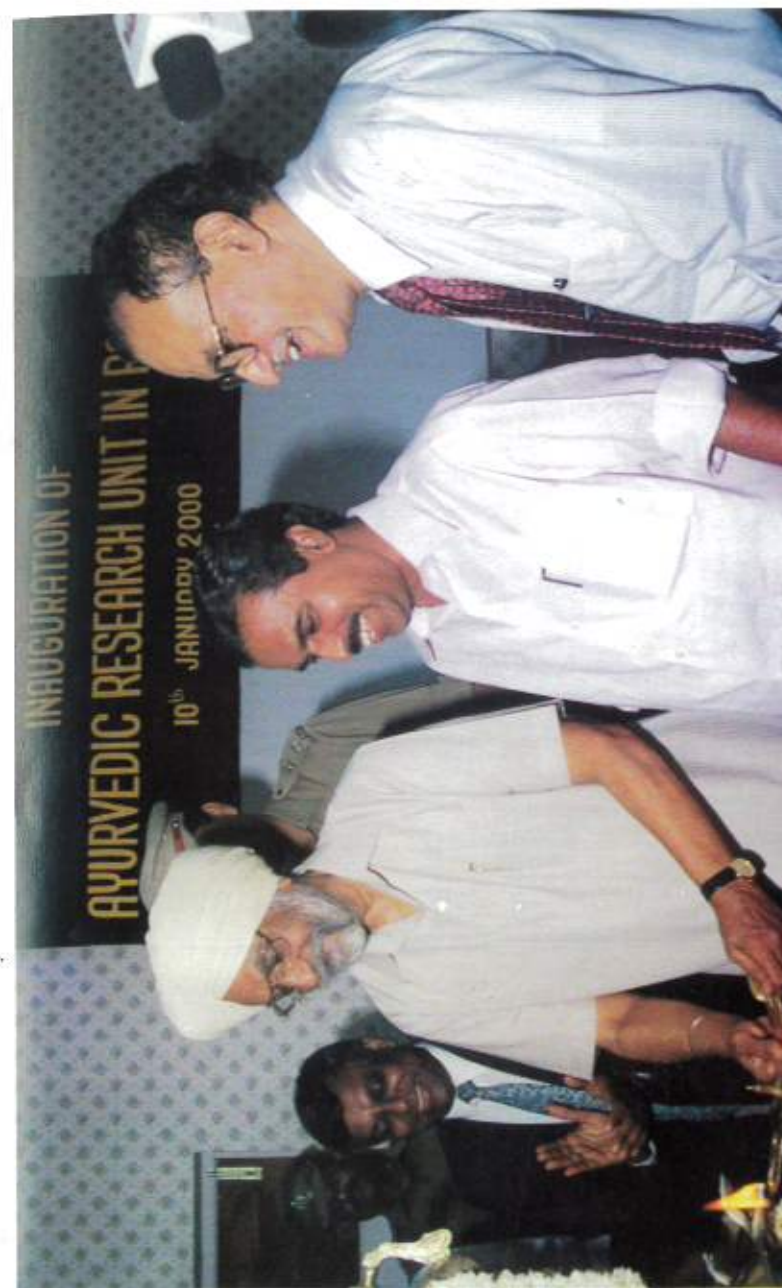
Academic activities included teaching and training in post graduate courses in Radiotherapy (MD & DMRT) to 8 students. Further weekly seminars and journal clubs are conducted. The staff also supervise planning, simulation and computerised planning related to teletherapy and brachytherapy.

Many staff participated in the national conferences such as AROI, Calcutta, APCC, Madras.

The Radiobiology Section attached to this division is making rapid progress under the leadership of Dr. V.N. Bhattathiri.

Radiobiology 2000, an International Conference on Radiation Biology was held from 17-19, February 2000 at Priyadarshini Planetarium. It was under the joint auspices of Regional Cancer Centre and Indian Society of Radiation Biology. Dr. Chidambaram, AEC Chairman was the Chief Patron and Dr. MR. Das (STEC) and Dr. M. Krishnan Nair (RCC) were the patrons and Dr. VN. Bhattathiri was the organizing secretary.

The meeting was attended by more than 200 delegates including more than 50 from abroad representing 13 countries. Dr. Stefan Groth (IAEA), Dr. Streffer (Germany), Prof. Vinay Jain (Delhi), Prof. Natarajan and Prof. Myllenders (Holland), Dr. K.S. Kumar (USA), Dr. NC Verma (BARC), Dr. T. Nakano (Japan) were participants. Dr. K.A. Dinshaw, TMH gave the Dr. AR. Gopal Ayengar Oration. The meeting was held in co-operation with the Atomic Energy Regulation Board, ARG Trust, Board of Research in Nuclear Sciences, Council of Scientific and Industrial Research, Department of Science and Technology, International Atomic Energy (IAEA), Indian Council of Medical Research, Transworld Academy of Medical Sciences (Trieste, Italy) etc.



His Excellency Governor, Justice Sukhdev Singh Kang inaugurated the Ayurvedic Research unit in RCC on 10th January, 2000, in the presence of Vaidya Balendu Prakash, Hon'ble Speaker M. Vijayakumar and Dr. M. Krishnan Nair.



Hon'ble Chief Minister, Sri E.K. Nayanan, Hon'ble Health Minister, Sri. A.C. Shanmughadas and Hon'ble Speaker, Sri. M. Vijayakumar inaugurated respectively Video Endoscopy Unit, Anbariesis Unit and Div Chemistry Analyser Unit in RICC on 26-10-1999

Examinership

Dr. V.N. Bhattathiri

Examiner for MD (Radiotherapy), Govt. Medical College, Aurangabad.

Meeting organized

Dr. V.N. Bhattathiri

1. Organising Secretary of National "SAQ-CME programme" for radiation technologists, October 9-11, 1999.
2. Organising Secretary of International meeting on radiobiology, entitled "Radiobiology 2000", February 17-19, 2000.
3. Organizing Secretary, Indo-German Workshop on Predictor Assays, February 21-22, 2000.

Positions held

Dr. V.N. Bhattathiri: Evaluator for papers in connection with 12th Kerala Science Congress conducted by Science, Technology and Environment Committee, Govt. of Kerala.

Dr. V.N. Bhattathiri has written "Cancer: Sareerathile Kadannalkoodu" in Deshabhimani daily (12th May, 1999) and "Cancer niyanthrikkann aaharakramam" in Kerala Kaumudi (17th August, 1999).

The following post graduate thesis projects are running.

1. Concurrent chemo radiation in carcinoma esophagus (Dr Susan Mathew)
2. Concurrent chemo radiation in carcinoma cervix (Dr Asha Arjun)

Ongoing research projects

1. **ATLAS - Adjuvant Tamoxifen in Breast Cancer - Longer against shorter Randomized clinical trial.**
(Funding agency: ATLAS-Clinical Trial Services Unit, Oxford, UK.)
Principal Investigator Dr. B. Rajan
2. **Estrogen receptor gene polymorphism in breast cancer and response to tamoxifen treatment**
(Funded by State Science & Technology Department)
Principal Investigator Dr. B. Rajan
3. **UKCCCR Randomised Trial of Adjuvant Endocrine Therapy and Chemotherapy in women with early breast cancer**
(Funded by UKCCCR, London)
Principal Investigator Dr. B. Rajan

4. **Primary progesterone therapy for operable breast cancer - a randomised multi-centre control trial (In association with Tata Memorial Hospital, Mumbai)**

Investigator Dr. B. Rajan

5. **Phase 3 Randomized Double-blind Evaluation of a new estrogen receptor modulator compared with Tamoxifen in women with locally advanced or metastatic breast cancer (In collaboration with M/s Eli Lilly Ranbaxy Ltd).**

Investigator Dr. B. Rajan

6. **Phase III study of RFS 2000 (9-Nitro-Camptothecin) Vs most appropriate therapy in refractory pancreatic cancer patients.**

Investigator Dr. S. Parameswaran

7. **Multicenter study of cremophor-free, protein stabilized, nanoparticle formulation of paclitaxel (ABI-007) in patients with stage IV metastatic breast cancer (Funded by Quilites India Ltd)**

Principal Investigator Dr M Krishnan Nair

Co-investigators Dr B Rajan, Dr K Ratheesan,
Dr N Geetha, Dr K Ramachandran &
Dr Jayaprasad

8. **An open randomised comparative multicenter study of the efficacy, safety and toleration of voriconazole vs amphotericin B followed by other licensed antifungal therapy in the treatment of acute Invasive aspergillosis in immuno compromised patients**

(Funded by Pfizer Central Research)

Principal investigator Dr M Krishnan Nair

Co-investigators Dr N Geetha, Dr K Ratheesan,
Dr Iqbal Ahamed, Dr K Ramachandran

Conferences, etc. attended - (Chapter III)

Papers presented - (Chapter IV)

Papers published - (Chapter V)

OBITUARY



Dr. F. JOSEPH

Born on 02-05-1945

Died on 26-10-1999

Dr. F. Joseph (Late Dy. Director and Professor of Radiotherapy, RCC) belonged to the 1963 MBBS batch of the Trivandrum Medical College. He Postgraduated from the same college in M.D. Radiotherapy. Starting his official career as tutor he became Professor and Deputy Director and died in harness.

He was a gentleman of highest character and has a special place in the hearts of all who came into contact with him. His diligence was indefatigable and he dedicated his life for the cause of patients especially the down trodden. He had a meticulously clean official career, and his exertion for honesty and hard work was unremitting. In his death RCC has lost an able administrator and a noble teacher. He leaves behind his wife Vilma Joseph, son Joseph and daughter Lucy Joseph.

MAY HIS SOUL REST IN PEACE

DIVISION OF SURGICAL ONCOLOGY

Dr. M. Iqbal Ahamed	- Assoc. Professor
Dr. Paul Sebastian	- Assoc. Professor
Dr. K. Chitrathara	- Asst. Professor
Dr. Jem Prabhakar	- Asst. Professor
Dr. Cherian Koshy	- Asst. Professor
Dr. Namrata Dhakkad	- Asst. Professor
Dr. Manoj Pandey	- Asst. Professor
Dr. Shaji Thomas	- Asst. Professor
Dr. Firoz Rajan	- Lecturer
Dr. Paul Augustine	- Lecturer
Dr. Bipin T. Varghese	- Lecturer
Dr. Elizabeth Mathew Iype	- Medical Officer
Dr. Chandramohan	- Medical Officer

Anaesthesiology

Dr. Gladys Jeevy	- Consultant
Dr. K. Gopalakrishnan	- Consultant
Dr. Rachel Cherian Koshy	- Asst. Professor
Dr. Mary Thomas	- Lecturer
Dr. Venugopal	- Lecturer

There has been an overall increase in the number of academic staff in the division of Surgical Oncology during the academic year. Three lectures, Dr. Firoz Rajan, Dr. Paul Augustine and Dr. Bipin T. Varghese have joined in surgery and Dr. Venugopal in anaesthesiology. Dr. Vasudevan Mappad has been shifted to anaesthesiology from the palliative care division. Moreover, Dr. Chitrathara has joined back after successfully completing MCh in Urology and Dr. Jem Prabhakar after acquiring vast experience in Photodynamic Therapy. This has resulted in an increase in the quantum of operative work during the period, but not in proportion to the strength and experience of the academic staff due to the lack of operating space and facilities. However, once the new theatre block with four operating rooms get fully equipped, probably by the end of this calendar year, the quantity and quality of the operative work could remarkably be improved and the present waiting list considerably reduced.

During the reporting year a total of 1526 surgical procedures were carried out, of which 924 were major procedures done under general anaesthesia (Table - 1).

TABLE - 1

Major operations	-	924
Minor procedures	-	602
Total	-	1526

Of the major surgical procedures, 162 patients had undergone primary radiotherapy and 163 patients had post chemotherapy residual or recurrent disease. 116 patients had previous surgery/surgeries at the same site, particularly those of thyroid, ovarian, gastrointestinal and retroperitoneal diseases.

Photodynamic Therapy (PDT) started last year as part of multicentric trial has been continued. The results of Foscan PDT as a curative modality in early recurrent oromandibular cancers have been very encouraging, though not in cases of advanced and refractory cancers as a palliative measure. In the light of successful conduct of this trial and the meticulous way it has been carried out, international agencies started approaching the centre with more new clinical trials and oncology related research work. The results of these trials presented in international conferences were very well appreciated; and the quality was of international standard.

The diagnostic endoscopic procedures, as in the last year have been carried out in the endoscopic division. Now the surgical oncology division could acquire the whole set of cystoscopic equipments and are being routinely used.

As in the previous years, head and neck cancers including thyroid and salivary tumours formed the major bulk of the operative work (Table - 2).

TABLE - 2

Region wise distribution of major operations

Region	Number	Percent
Head and neck	489	52.92
Breast	160	17.32
Genitourinary	135	14.61
Gastrointestinal and retroperitoneum	64	6.93

Bone and soft tissues	49	5.30
Skin including malignant melanoma	27	2.92
Total	924	100.00

In the head and neck region, oromandibular cancers formed the major site of cancer (56.5%), particularly tongue, buccal mucosa, lower alveolus and floor of the mouth. As a single anatomical site, tongue was the commonest site, and majority of tongue lesions were locally advanced, where surgery was offered as the primary modality of treatment of often following anterior chemotherapy; and in nearly 70% of such resections, primary reconstruction was performed using various pedicled flaps. During the reporting year there was an increase in the number of laryngopharyngeal resections done for patients with post radiotherapy residual/recurrent laryngeal cancers, and in almost all such cases pharyngeal reconstruction was done, using pectoralis major myocutaneous flap.

Compared to previous years, there was an increase in the number of patients with genitourinary cancers being operated here; similarly the number of oesophageal resections and breast reconstructions have also gone up.

Anaesthesiology

A total of 945 patients were given anaesthesia for various surgical procedures. This include 11 patients in whom photodynamic therapy was done under general anaesthesia because of difficult accessibility and 10 patients where reexploration was done for various reasons. There was no evidence of anaesthetic mishap.

In 20 patients surgical procedures were carried out under epidural anaesthesia, where the epidural catheter was retained for 2-3 days for post operative pain management.

In 77 patients awake nasal blind intubation was done because of the risk involved in intubation of anaesthesia even in cases of extensive resection of oromandibular cancers; however 53 patients required tracheostomy for various other reasons.

Associated co-existing diseases were treated and controlled before taking up for anaesthesia. These include:

Hypertension	-	209
Heart disease	-	120
Diabetes	-	210
Respiratory diseases	-	112

Drug allergy	-	19
Psychiatric problem	-	9

Academic Activities

Post graduate students in general surgery from Medical College, Trivandrum and in oral and maxillofacial surgery from Dental Colleges in Trivandrum and Calicut, and from A.B.Shetty Dental College, Mangalore had regular postings in this division.

Intra divisional journal clubs and symposia were conducted regularly on-Saturdays.

Research Projects

- 1. Population based screening for oral premalignant lesions through inspection and oral examination - Trivandrum Oral Cancer Screening Study (TOCS)**
(Funding agency : IARC, Lyon, France)
Co-investigator Dr. Paul Sebastian, Dr. Manoj Pandey
- 2. Evaluation of chemoprevention of oral cancer with long term administration of vitamin A in subjects at high risk.**
(Funding agency : IARC, Lyon, France)
Co-investigators Dr. M. Iqbal Ahamed, Dr. Manoj Pandey
- 3. Trivandrum rural cohort in tobacco related mortality (TRIM)**
(Funding agency : IARC, Lyon, France)
Co-investigators Dr. M. Iqbal Ahamed, Dr. Manoj Pandey
- 4. Psycho-social and vocational rehabilitation of cancer survivors.**
(Funding agency : Centre for development studies, Trivandrum)
Principal investigator Dr. M. Iqbal Ahamed
- 5. Evaluation of chemoprevention of second primary in patients with head and neck cancer with administration of vitamin A.**
(Funding agency : IARC, Lyon, France)
Co-investigators Dr. Manoj Pandey
- 6. Phase III open labelled single group study into the effect of foscarn mediated PDT on recurrent, squamous cell carcinomas of oral cavity.**
(Funding agency : Nova scotia, UK)
Co-investigators Dr. M. Iqbal Ahamed,
Dr. Jem Prabhakar, Dr. Paul Augustine

- 7. A multicentric open labelled single and multiple dose study of foscarn mediated PDT for the palliative therapy of recurrent, refractory or second primary SCC of head and neck in patients considered to be incurable by surgery or radiotherapy.**
(Funding agency : Nova scotia, UK)
Co-investigators Dr. M. Iqbal Ahamed,
Dr. Jem Prabhakar, Dr. Paul Augustine
- 8. The primary progesterone therapy for operable breast cancer a randomized multi-centre control trial.**
(Funding agency : Indian breast group TATA Memorial Hospital, Dr. E.Borges Marg, Parel, Mumbai)
Chief investigator Dr. M. Iqbal Ahamed
- 9. A prospective study on postoperative complications in patients undergoing head and neck cancer surgery.**
Investigator Dr. M. Iqbal Ahamed
- 10. Should we do a hemithyroidectomy during total laryngectomy - A prospective analysis of 100 cases.**
Investigator Dr. M. Iqbal Ahamed
- 11. A cervicoscopy study - visual inspection using 3% acetic acid as a screening strategy.**
Co-investigator Dr. Namrata Dhakad
- 12. Natural history of genital HPV infection**
Co-investigator Dr. Namrata Dhakad
- 13. Comparative evaluation of early detection of cervical cancer precursors by visual inspection with acetic acid and by Schiller's iodine in Kerala, India.**
Co-investigators Dr. Namrata Dhakad
- 14. Cancer vaccines for ovarian cancer**
Co-investigator Dr. Namrata Dhakad
- 15. Prospective trial for rehabilitation of Lymphoedema in patients cured for breast cancer**
Co-investigator Dr. Namrata Dhakad
- 16. Cervical cancer control project**
Co-investigators Dr. Namrata Dhakad, Dr. Chitrathara,
Dr. Paul Sebastian

17. **HPV Infection in oral malignant and premalignant lesions (1999-2004)**
(Funding agency: NCI, John's Hopkins University, USA)
18. **Geotyping of the CYP1A1 and GSTM1 genes in Tobacco associated oral cancer (2000-2003)**
(Funding agency: Indian Council of Medical Research, New Delhi)
19. **Metalloprotenases in oral cancer (2000-2003)**
(Funding agency: Indian Council of Medical Research, New Delhi)

Awards/Honours/Fellowship/Training

Dr. Manoj Pandey

1. Selected to be featured on the Who's Who in the World: 2000, 17th Edition.
2. Selected for distinguished leadership certificate - award 1999 by American Society of Bibliography.
3. "2000, Millennium Medal of Honour" awarded by American Institute of Bibliography, USA.
4. Citation in "2000 outstanding intellectuals of the 20th century" by International Biographical Centre, Cambridge, UK.
5. Best paper award - IASO NATCON 99, Jolly grant, Dehradun, October 8-10, 1999.

Dr. Elizabeth Mathew Iype

1. Dr. S. Kameswaran gold medal for the best All India Candidate in Otorhinolaryngology, Puna, August, 1999.
2. Secured first place in the quiz competition held in the State Annual Conference of the Association of Otolaryngologists of India, Cochin, May 2000.
3. Award of the membership of National Academy of Medical Sciences, January, 2000.

Conferences, etc. attended - (Chapter III)

Papers presented - (Chapter IV)

Papers published - (Chapter V)

DIVISION OF PAEDIATRIC ONCOLOGY

Dr. P. Kusumakumary	-	Assoc. Professor
Dr. T. Priyakumary	-	Asst. Professor
Dr. Mini S.	-	Lecturer
Dr. Sunu John	-	Resident Medical Officer
Dr. Sivanandan	-	Lecturer

Paediatric Oncology division is directly concerned with the management of patients up to the age of 14 years registered in this centre.

Clinical Activities

Out patient service functions on all six days every week. The distribution pattern of paediatric patients registered during the reporting year is given below.

Distribution	Number
Total new cases	369
Acute lymphatic leukaemia	105
Acute myeloid leukaemia	22
Non Hodgkin's lymphoma	10
Hodgkin's disease	15
Brain tumour	30
Neuroblastomas	18
Wilm's tumour	13
Germ cell tumours	15
Rhabdomyosarcoma	14
Soft tissue sarcoma	5
Hepatoblastoma	5
Osteo sarcoma	13
Ewing sarcoma	4
Retinoblastoma	14
Langerhan cell histiocytosis	8
Naso pharyngeal carcinoma	3
Carcinoma pancreas	1

Adenocystic carcinoma parotid	-	1
Myelodysplastic syndrome	-	2
Carcinoma thyroid	-	3
Papillary mesothelioma testis	-	1
Spindle cell tumour	-	1
Melanocytic tumour	-	1
Nerve tissue myxoma	-	1
Melanotic neuroepithelial tr	-	1
Pilonatricoma	-	1
Aplastic anemia	-	5
Non malignant	-	24
Total OPD cases	-	8532
Total inpatients	-	679

The most common malignancy reported was acute leukaemias (37.57%). Of the acute leukaemias 82.6% were acute lymphoblastic leukaemia.

All new patients were evaluated in detail and appropriate treatment was given. This division has an exclusive ward for management of paediatric oncology patients alone. The division conducts daily counselling sessions for parents of paediatric patients. Paediatric tumour board, with a multidisciplinary team consisting of paediatric oncologist, paediatric surgeon, pathologist and radiation oncologist was held every Monday at 2 PM and major treatment decisions were taken.

Academic & Research Activities

The division actively took part in the teaching, training programmes for under graduates and post graduates (MD RT & MD paed) students from Medical College, Trivandrum. Training programmes were also conducted for MSc and BSc Nursing students and Nursing assistants regarding the various aspects of paediatric oncology.

Sangamam '99

Paediatric Oncology Division organised a unique meeting on November 14, 1999 - A get together of long term survivors of childhood cancer at RCC. About 100 cured persons and their family members

whole heartedly came to participate in the Sangamam '99. It was a full day programme and was very well appreciated by the media and public alike. It was a morale boosting experience for the parents of paediatric patients presently undergoing therapy.

Research projects

1. **Molecular Epidemiology of Paediatric Leukaemias and Lymphomas in Kerala India in collaboration with Dr. Gareth Morgan, University of Leeds, UK.**
2. **Virafeon as a vaccine adjuvant with Hepatitis B vaccine in collaboration with Medical Gastroenterology Department, MCH, Trivandrum.**

Award/Fellowship

Dr. Priyakumari T.

ICRETT-Fellowship at Rollins School of Public Health and Medicine, Emory University Atlanta, Georgia USA, March - April, 2000.

Conferences, etc. attended - (Chapter III)

Papers presented - (Chapter IV)

Papers published - (Chapter V)

DIVISION OF MEDICAL ONCOLOGY

Dr. V.P. Gangadharan	-	Assoc. Professor
Dr. N. Geetha	-	Assoc. Professor
Dr. Sreejith Nair	-	Asst. Professor
Dr. B.M. Hussain	-	Lecturer (on leave)
Dr. NP Prakash	-	Lecturer "

This division is responsible for the diagnosis and management of haematological and lymphoreticular malignancies and solid tumours, where intensive chemotherapy is needed.

About 1,750 new cases and 15,000 cases are reviewed in the out-patient section annually by this division. The in-patient admissions and services are for chemotherapy and management of emergencies and complications and approximate 50-60 patients at any time. Special procedures like bone marrow aspiration and biopsy and central venous catheter insertion are done routinely.

Academic activities

Post-graduate residents in Medicine and Radiotherapy are trained in medical oncology in this division. In addition, training is imparted to the nursing staff and students of RCC with emphasis on the care of immunocompromised host.

Research projects

- Interferon α 2a in chronic phase of CML**
Investigator Dr. V.P. Gangadharan
- Neoadjuvant chemotherapy and limb salvage in osteosarcoma**
Investigator Dr. V.P. Gangadharan
- Cutaneous manifestations of lymphoreticular malignancy**
Investigator Dr. V.P. Gangadharan
- Role of intrinsic nuclear factors in prognosis of osteosarcoma**
Investigator Dr. N. Geetha
- Study on the efficacy of alpha Interferon in combination with cytarabine in chronic myelogenous leukaemia**
Investigator Dr. N. Geetha

- A randomized, open label comparative Multicenter Trial of Voriconazole Vs. Ambisome for empirical antifungal therapy in immunocompromised patients with persistent fever and neutropenia.**

Co-Investigator Dr. N. Geetha

Randomised 8 patients with neutropenia during the intensive phase of treatment of AML and ALL in this trial.

- Multicenter study of Cremophor free protein stabilized nanoparticle formulation of Paclitaxel in patients with stage IV metastatic breast cancer.**

Co-Investigator Dr. N. Geetha

- Multicenter study of Cremophor free protein stabilized nanoparticle formulation of Paclitaxel (low dose) in patients with stage IV metastatic breast cancer.**

Co-Investigator Dr. N. Geetha

- A randomized, open label comparative Multicenter study of Voriconazole Vs. Amphotericin in invasive aspergillosis.**

Co-Investigator Dr. N. Geetha

- A randomized, open label International study of Interferon alpha Vs. pegInterferon in chronic myeloid leukemia.**

Co-Investigator Dr. N. Geetha

Awards/Fellowship/Training

Dr. N. Geetha

- Training in Stem cell Transplantation, Washington Hospital Centre, Washington and National Cancer Institute of Health, Bethesda, USA, August, 1999 to February, 2000.
- Awarded the National Cancer Institute, USA fellowship to undergo training in transplantation for the year 1999-2000.
- Awarded the International Paediatric Oncology Society fellowship for the year 2000.

Conferences, etc. attended - (Chapter III)

Papers presented - (Chapter IV)

Papers published - (Chapter V)

DIVISION OF DENTAL CARE

Dr. Nalina Kumari K.R. - Lecturer

This division is instituted to provide complete dental care for cancer patients. This division functions six days a week and imparts a variety of treatment modalities for the benefit of cancer patients. The various procedures undertaken are included below.

Highlights of activities

1. Basic procedures like
 - a. Oral prophylaxis
 - b. Conservative therapy
 - c. Dental extractions
2. Minor surgeries like oral biopsies
3. Therapeutic management of pre-cancerous and other oral lesions
4. Management of temporomandibular problems like trismus, occlusal adjustments
5. Reconstructive procedures like construction of maxillofacial prosthesis
6. Pre and post radiation care of teeth
7. Management of oral problems of patients undergoing chemotherapy like ulcers, spontaneous bleeding, toothache etc.
8. Preparation of bite blocks & moulds are also under taken

Patients are referred to this unit directly from the out patient unit or from the radiotherapy unit as from the various other units functioning within the RCC.

Table 1. Patient attended during the year 1999-2000

Total number of patients attended	3325
Total number of new cases	756
ECCDC patients	1
CCL patients	15
Pre-cancer patients attended	1

Table 2. Services rendered during the year 1999-2000

Service	Number
Biopsies taken	503
Teeth extraction	2364
Post radiation (new cases)	218
Total No. of PRC of teeth cases	525
Maxillofacial prosthesis prepared	1
Conservative therapy	9
Oral prophylaxis done	65
Bite blocks & moulds prepared	1
Occlusal adjustments done	5

Table 3. Site-wise distribution of biopsies done in 1999-2000

Site of biopsy	No.	Percentage
Right buccal mucosa	75	14.91
Left buccal mucosa	94	18.69
Right commissure	9	1.80
Left commissure	15	2.98
Hard palate	20	3.98
Soft palate	6	1.19
Right oropharynx	1	0.20
Right retromolar region	12	2.39
Left retromolar region	10	1.99
Dorsum of tongue	24	4.77
Left border of tongue	47	9.34
Right border of tongue	37	7.36
Tip of tongue	2	0.40
Under surface of tongue	5	0.99
Floor of the mouth	21	4.17
Left lower alveolus	38	7.55
Right lower alveolus	24	4.77
Left upper alveolus	9	1.80
Right upper alveolus	6	1.19
Left lower sulcus	4	0.80

Right lower sulcus	10	1.99
Left upper sulcus	4	0.80
Right upper sulcus	5	0.99
Maxilla	3	0.60
Lower lip	16	3.18
Upper lip	5	0.99
Total	503	100.00

Pre and Post Radiation Care of Teeth

One of the functions of this division is to provide pre and post radiation care of teeth for cancer patients.

The importance of pre & post radiation care lies in the fact that if not carried out with extreme strictness then the patients will have to suffer the inevitable consequences like sever sensitivity of teeth. Post radiation caries and finally osteoradionecrosis.

In the pre-radiation care we try to eliminate all the conditions within the oral cavity which are liable to post a problem during the next 5-10 years after radiation therapy especially in the head & neck region. This includes procedures like oral prophylaxis, conservative therapy, extractions & oral hygiene instructions for better maintenance during treatment.

Another main complaint of patients during and after radiation and chemotherapy include burning sensation of the oral cavity and mucosites. This is managed by the use of smoothening, protecting and anti-microbial oral rinses and ointments.

Post-radiation care includes mainly fluoride therapy, which is advocated to all the patients undergoing radiation in the head and neck region, is one of the best possible ways to protect the teeth from sensitivity and post radiation cares. Currently about 560 patients are undergoing fluoride therapy of which about 218 are new cases. This therapy is to be continued for about one and half years from the day of radiation. Patients under this therapy have less complaint concurring the oral cavity than those not using this therapy.

Other activities

1. Biteblocks and moulds were prepared for treatment of oral cancer patients in connection with their treatment with radiation and radium implantation.

2. Maxillofacial prosthesis for correcting the deformities of the face after doing surgery in some cases of oral cancer.
3. For pre-malignant cases of leucoplakia, SMF, lichen planus etc. monthly check-up is conducted to assess the condition of patients who are under treatment.

Research Activities

This division rendered support to the Research Division and Radiotherapy department.

Conferences, etc. attended - (Chapter III)

Papers presented - (Chapter IV)

Papers published - (Chapter V)

DIVISION OF CLINICAL SERVICES AND MEDICAL RECORDS

Mr.R. Raveendran Nair	- Administrative Officer (Clinical Service)
Mr.V.Surendran Nair	- Asst. Public Relations Officer
Mr. G. Rajasekharan Nair	- Medical Records Officer

This division is concentrating on three aspects of patient services:

1. Public relation and front office management
2. Medical records maintenance
3. Patients accounting and billing

Since the quantity of work has been increasing day by day we are planning to computerise the entire activities of patient service. The initial work-up and system study has already been taken by our Computer Division. The following are the activities under the reporting year.

- Public relation
- Out-patient service with the support of nurses and other paramedical workers
- New registration and income assessment
- Case sheet assembling after registration
- Patient identity card preparation
- Follow-up
- Issue of all laboratory reports, and X-rays
- Preparation and issue of all certificates
- Interim filing of case sheets
- Summary typing
- Pay ward booking and its allotment
- Conduct of follow-up clinics at ECDC, Ernakulam
- Co-ordination of CCL, ESI, CGHS and health schemes
- Conduct of pay clinic
- Filing and retrieval of case sheets for follow-up, admission, research, cancer registry and other services

- Maintenance of death register and death reporting
- Send follow-up letters and other patient correspondence
- Maintaining of various registers
- Coding and indexing
- Data entry at various level
- Filing of all laboratory reports and X-rays
- Abstract and update the case sheet for outside clinic
- Printing and issue of various forms
- Telephone exchange operation
- Lesion with press and electronic media
- Arrangement of press conference and issue of press release
- Patient welfare activities including proper guidance and assistance to patient for getting financial aid from various bodies.
- Arrangements of interviews and discussion with Doordarsan, Soorya and Asianet
- Received complaints and feedback about the services from patients and brought to the notice of the concerned officials.
- Guidance given to various trainees coming to our centre
- Coordination of public function and workshops

During the reporting year, RCC has provided free of investigation and treatment except chemotherapy to 51% of total patients and 18% of patients have been provided both investigation and treatment at a concession rate. The 6% of the patient has been opted to register under "P" category and 25% under ordinary category. The centre has spent Rs. 35,43,158/- towards the cost of anticancer drugs and Rs. 3,56,291/- towards the cost of other supportive medicines to the poor patients.

During the year under report 132 new cancer patients received investigation/treatment under Cancer Care for Life insurance scheme, 588 patients received benefits from ESI scheme, 268 patients received benefits from CGSS/CHSS scheme, 92 patients received benefits from other schemes.

The public relation wing has released more than 50 press notes during this period. This wing has published more than 50 articles about the centre during this period in various media.

The clinical service is making all efforts to get more financial support to poor patients from Prime Minister's National Relief Fund, Chief Minister's Relief Fund and other organisations. More than 43 lakhs rupees has been sanctioned by the Hon.ble Prime Minister of India to poor cancer patients.

The Susan Daniel Cancer Relief Fund, California, USA helped more than 50 patients at the rate of \$50 per patient. M/s MELAM MASALA contributed more than six lakh rupees to poor patients. Many other organisations helped the poor patients in many ways. We acknowledge all who have contributed to the poor patients welfare fund.

R. Raveendran Nair was invited as external examiner for the final year students M.App. Science (Medical Documentation) Course at M.G. University, Kottayam.

Sri. V. C. Kabeer, Hon.ble Minister for Health and Family Welfare released a book named "Medical Laboratory Technology" written by Mr. V. Surendran Nair, Asst. Public Relations Officer. The book was published by State Institute of Language.

17 students of M.App. Science (Medical Documentation), M.G. University, Kottayam has completed their practical study in the front office and medical records for a period of 15 days and 3 students completed their project work for a period of three months through this division.

This division also assisted 3 students of Hospital Administration for their project work.

Table 1. Patient attendance during current and previous year

	Current year (1999)	Previous year
New cases registered	9269	9002
Review cases	92685	85607
- Radiation Oncology	71678	62976
- Surgical Oncology	2361	2670
- Medical Oncology	11094	12206
- Paediatric Oncology	7552	8055
Total patients (New & Old)	101954	94909
Daily average patients	340	316
Average attendance per patient	11	10.5
No of inpatient admission	7623	6901
- Radiation Oncology	3082	3120

- Surgical Oncology	838	764
- Medical Oncology	2373	2149
- Paediatric Oncology	879	868
- Palliative Care	451	--
Total appointment given	74513	67103
Attendance from appointment	64985 (87%)	57448 (86%)
Average in patients length of stay	10	10
Hospital Deaths	509	437
Total number of 'P' patient	724	--
New 'P' patient	549	--
Old 'P' patient	175	--
Total number of review 'P' patient	2641	--

When we compare the district wise distribution of new case with that of previous year it is almost same in the reporting year. Table 2 shows the same.

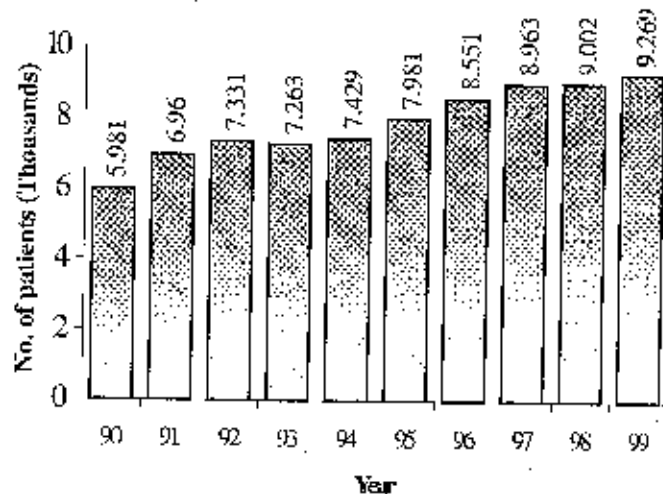
Table 2. District wise distribution of new cases reported at RCC

District	No.	% (Current year)	% (Previous year)
Trivandrum	2650	28.6	27.7
Kollam	1892	20.4	20.2
Pathanamthitta	611	6.6	6.2
Alapuzha	474	5.1	5.5
Kottayam	257	2.8	2.8
Idukki	104	1.1	1.2
Ernakulam	734	7.9	8.0
Trichur	459	5.0	4.2
Palkkad	2.8	2.8	
Malappuram	335	3.6	3.6
Waynad	31	0.3	0.5
Kozhikode	196	2.1	2.7
Kannur	298	3.2	3.5
Kasargod	45	0.5	0.4
Other State	921	9.9	10.7
Total	9269	100	100

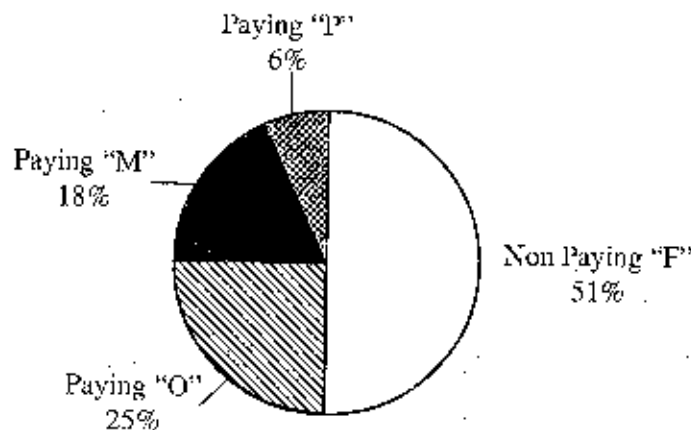
Number of patients registered during the last 10 years (1989-99)
Number of paying and non-paying cases - 1999

Conferences, etc. attended - (Chapter III)

Number of Patients registered during the last 10 years (1989-1999)



Number of paying and non-paying cases - 1999



DIVISION OF NURSING SERVICES

Sr. Vijaya CNO & Assoc. Prof. of Nursing
 Ms. Usha Bal D Nursing Officer
 Ms. Graceamma Joseph Nursing Superintendent

The division is concerned with rendering comprehensive quality care to suffering cancer patients on a holistic view point which includes physical, social, emotional, cognitive and spiritual needs of the individual patient. This division has been actively involved in rendering palliative care services to patients with advanced cancer and conducting training programmes in Oncology Nursing and Palliative Care.

Outpatient Services

The out-patient department consists of cancer clinics, specialty clinics, blood bank, clinical laboratory, endoscopy, imageology and nuclear medicine. Nurses have a vital role in this area by providing the necessary information, direction, guidance and psycho-social support to patients and bystanders and in assisting various investigative procedures and diagnostic tests.

Chemotherapy Day Care Unit

The unit functions as an out-patient Day Care Unit with 25 beds. An average of 100-110 patients avail of the service of this unit daily.

Medical Oncology

Nurses in this unit look after patients with various types of leukaemia, lymphoma, osteosarcoma and all other cancers requiring aggressive chemotherapy.

Radio-iodine Unit

The unit is specially equipped to admit patient for radio active iodine treatment for thyroid cancers. Mostly patients capable for self care are admitted to this unit and the nurses are on call to this unit through a hot line system. Patients are educated on radiation hazards and the need for isolation on intake of radio active iodine.

Surgical Oncology

This unit comprises of operation theater and surgical ward. Common surgical procedures include that of head and neck, breast,

thyroid, genitourinary and gastrointestinal systems and of the bone and soft tissue. Home care teaching programme for bystanders has been very active in this unit.

General Ward

Majority of the patients admitted to unit are elderly, dependent and in the advanced stages of cancer requiring very close attention.

Payward Block

Since patients in different stages of cancer are admitted in this block, the responsibilities of nurses vary and they make earnest effort to provide individualised care. Admission to this unit is meant specially for surgery, radiation, chemotherapy, or for palliation.

Barchytherapy

This unit holds a ten beds capacity and provides facilities for interstitial implantation, intraluminal radiotherapy, intracavitary radiation for ca. cervix and ca. oesophagus by using High Dose Rate Micro Selectron. Selectron (LDR) is also used for treatment of ca. cervix. Nurses are given training on radiation hazards and radiation precautions.

Paediatric Oncology

The unit is equipped with a play room and mother's room. Mothers are encouraged to stay with their children. Children with leukaemia, lymphoma, neuroblastoma, Wilm's tumour and brain tumours are cared for in this unit.

Staff Development Programme

The Nursing Division strives to improve the standards and quality of nursing care by organising periodical training programme for the nursing staff.

Educational sessions are conducted for nursing staff in their monthly unit meetings, in which nurses present relevant topics and case studies and in certain units special classes are given by doctors.

Separate meetings are held for Head Nurses and Staff Nurses every month. Nurses are given opportunities to attend workshops/conferences/training programmes at local/state/national/international level. They are always encouraged and helped to present relevant papers in such programmes.

An intense training programme of three days duration on chemotherapy has been organized by the division for all the nursing staff in three batches during January to February, 2000.

Palliative care unit

Palliative nursing care services in RCC got its inception in 1992 in collaboration with the out-patient pain clinic activities. From 1993 onwards, nurses with more commitment and aptitude were motivated and selected for special training in palliative care nursing. The palliative care unit, designed by the Nursing Division as per the model unit of the Royal Marsden Hospital with a training as well as service section consisting of 8 general beds and 4 single room beds got commissioned in November, 1998. A day care unit was well furnished with the financial help of Ashraya Volunteer donation. During the year under report, the Division also organised and conducted 3 training programmes of one month duration on Palliative care for nurses sponsored by Directorate of Health Services of Kerala State. A total of 40 nurses from all over Kerala have completed the training successfully.

Observation / Orientation Programmes

This division provides for one day observation / orientation programmes in oncology for under graduates and post graduates. Nursing students from various universities of Kerala State and that of outside Kerala and for the self financing colleges of nursing. The BSc(N) and MSc(N) students from College of Nursing, Trivandrum are given clinical posting in oncology for one month every year. Departmental visits and consultations are arranged for non nursing students too.

This division conducts a Nursing Assistant's training programme of one year duration followed by compulsory apprenticeship.

Awards/Fellowships/ Honours/Training

Sr. Vijaya

1. UICC International Oncology Nursing Fellowship (IONF), Memorial Sloan Kettering Cancer Centre, New York, may 1999.
2. Life member, UICC
3. Award for Vocational Excellence by Rotary Club of Trivandrum North, October, 1999.
4. Executive Committee Member - Nursing Research Society of India (NRSI) 1997-2000.

5. Expert Committee Member to finalise the "Nursing standards for nursing practice in selected areas" under WHO project IND/HRH/031/98, Indian Nursing Council, New Delhi, November, 1999.

Ms. Graceamma Joseph

Appointed as Nursing Superintendent Gr. II w.e.f 15.11.1999.

Kumari Thankam

Successfully completed her studies and secured Diploma in Palliative Care (1 year), Oxford Brooks University, UK.

Ms. Lizyamma Jacob

10 day course on "Management techniques and Head Nurse clinical updates", Indian society of hospital administrators, Bangalore, January 12-21, 2000.

Mrs. Geetha P.T

Successfully completed MSc. Nursing of Kerala University.

Conferences, etc. attended - (Chapter III)

Papers presented - (Chapter IV)

Papers published - (Chapter V)

DIVISION OF PHARMACEUTICAL SERVICES

Dr. T. Gangadevi - Professor (MO I/C)

Sri. Sivasankara Pillai - Pharmacist cum Store Keeper

This division is one of the main functional units of this centre. This consists of two sections.

a) Central stores

The objectives of this section are to render quality medicines/equipments, chemicals/reagents and other disposable items which are required for patients care service of in-patients/out-patients, diagnostic departments, research and palliative care units periodically. Drugs and chemicals are dispensed on weekly requirements.

The central stores possess 46 anti-cancer drugs, all first and second line of antibiotics, analgesics, anti-pyretic, anti-emetics, anti-histamic, diuretics, laxative drugs and closely disposables like removac suction, cavafix and pain clinic drugs like morphine sulphate tabs and liquid morphine. The main functions of central stores are as under:-

1. Receipt of all drugs, disposable items, minor equipments, X-ray films/chemicals, laboratory chemicals/reagents, cleaning materials, clothing for patients/staff from different suppliers as per purchase orders.
2. Receipts/issue of local purchase items to meet the emergent requirements in wards/ departments.
3. Stock entry as per Invoice is made into the computer stock from time to time.
4. Issue of anti-cancer drugs, antibiotics, fluids and other disposable to pharmacy for patients care service.
5. Issue of all drugs (except anti-cancer drugs) other disposables and cleaning materials are to be issued for all wards/departments and contractors through their weekly indents after the parusal MO I/C / Superintendent.
6. Proper maintenance of stock and accounts.
7. Conducting of stock verification on a monthly basis, quarterly by audit authorities and yearly.
8. Preparation of all types of indents in time.

Purchase of all drugs and other requirements are mainly through tender system. The requirements will be calculated on the basis of average monthly consumption recorded during the last 12 months. Local purchase are also will have to be made as and when required basis to meet the exigencies of drug/equipment for a particular period/ case only as per sanction accorded by superintendent.

A morphine manufacturing unit is being commissioned shortly to meet the requirement of palliative care unit.

It is to be appreciated that considerable number of patients are getting free drugs.

Detailed study reports are appended below:-

Total patients reported for treatment	- 6839 Nos.
No. of free patients reported	- 1446 Nos.
Total item purchase in central stores	- Rs. 3,16,18,467.38/-
Total free drugs issued during the period	- Rs. 42,42,176.90/-
Total cash collected	- Rs. 3,16,18,467.38/-

b) Pharmacy

The prime function of this section is to assist in the proper management of patients by providing all anti cancer drugs, antibiotic and other disposable items for all cancer patients and free anti-cancer drugs as per the RCC protocol. Medicines and other items are being issued through computerized system by which the daily stock position is ascertained and stocks replenished.

DIVISION OF PAIN AND PALLIATIVE CARE

Dr. Rachel Cherian Koshy	Assoc. Professor Medical Officer-in-Charge
Dr. Mary Thomas	Lecturer
Dr. Vanugopal A	Lecturer
Dr. R. Manjula	Resident Medical Officer
Ms. Kumari Thankom	Nursing Officer-in-Charge
Dr. P.T. Latha	Lecturer

The division continued to offer pain relief, relief of other symptoms, counselling, family support to referred cancer patients, both out patients and inpatients and during home visits. The division undertook an intensive educational effort to give hands on training in palliative care to interested doctors and nurses both from the government and private sector. This training programme was funded by the Directorate of Health Services, Kerala. Faculty included visiting specialists and staff from other divisions of RCC.

The year under report has been a time to consolidate the recent progress in palliative care in RCC. A multidisciplinary approach is often required and necessary consultations are made as and when required. Another highlight of the year has been the successful completion of Diploma in Palliative Nursing from Oxford University by Kumari Thankom. She is the first nurse in India to obtain this qualification. In October 1999, she took over a Nursing Officer-in-Charge of Palliative Care. Thus building up of a fairly cohesive core palliative care team was achieved.

A. Patient Services:

Out Patient

Total no. of New patients	- 1868
Old cases/repeat visits	- 7860
Total patient visits	- 9728

Follow-up study

It was observed that several new patients make only one visit to the pain clinic. Research aimed at finding the reason for poor follow-up and for improving patient follow-up was conducted with the help of Ms. Archana - a volunteer. 549 out of 919 new patients registered in

he pain clinic from April to September 1999 who had not reported for follow-up were sent letters during October to December 1999. The results of the study are, 549 new cases were followed up from October to December, 1999; of these 249 were replied, 276 were not replied and 24 were address not known. Of the replies 157 were expired and surviving 92. Of the survivors 31 case for follow-up to pain clinic, 1 came to other departments in RCC and 50 patients did not come to RCC.

Auditing of our own service helped us to understand the need or strengthening the network of palliative care services in Kerala and adjoining Tamil Nadu areas. Steps are being taken towards this goal. We have started giving appointments to patients for subsequent visits.

Interventional pain management was offered to patients with intractable pain

Interventional pain management	No.
Sphenopalatine ganglion blocks	20
Coeliac plexus blocks	8
Stellate ganglion block	1
Peripheral nerve block	6
Epidural blocks	1
Trigger point injections	5
Total	41

In-patient wing: 451 patients were admitted. Of them 100 were provided terminal care; 59 were treated symptomatically and referred to hospices. 286 patients improved with supportive care and were discharged to their homes.

Volunteer service: has been streamlined. Two volunteers are available during the day in the Palliative Care Centre. They provide emotional support, practical and financial help under the supervision of the staff.

Home care service: Hospital based home care service has been started since December 1999. It runs once in a week and up to March 2000 we have cared for 62 patients at their home. Patients seen at home are provided comprehensive nursing care, pain and symptom relief evaluation, counselling and training the carers on wound care, Ryle's tube feeding etc. This service will be an ongoing programme of Palliative Care Centre.

Day care service: has been a long felt need for a large number of cancer patients. A day care service for palliative care patients as well as patients in other wards of RCC has been started. This will be further expanded in relation to continuing home care service.

Support groups: We run support groups for our in-patient's family/friends aimed to share their worries/concerns, clear their doubts regarding care and to help them to cope with the illness of their loved ones.

Breast cancer rehabilitation service: We run pre and post mastectomies support group. We teach post mastectomy exercises and educate them regarding how to do self care after breast surgery. We provide breast prosthesis which is made in RCC (beaded foam material) and also imported silicon ones for the needy. 265 breast prosthesis has been dispensed in the reporting year.

Lymphoedema care: The clinic sees lymphoedema patients regularly. Up to March 2000 we have seen 60 referred lymphoedema patients. They pay visit to the clinic once or twice in a month. We teach specific lymphoedema exercises, provide hosiery (arm and leg sleeves) and demonstrate massage technique. Pneumatic compression pump is also available. We run support group for lymphoedema patients too.

Counselling service: is also offered for referred patients.

Complementary therapy: including music, magnet therapy, TENS, massage therapy were given to selected patients.

Outreach services: a) *Hospice care:* Karunya Visranti Bhavan Hospice run by charity at Kattela is provided regular visit and support for medication; training programme for the hospice staff is provided by the palliative centre. Total 59 patients sent from RCC.

b) *Visiting peripheral centres:* Once in a month - 1st Tuesday, District Hospital, Pathanamthitta and Twice a month visit to Pain Clinic, ECDC, Ernakulam.

B. Educational Activities

Regular one month training for registered nurses and doctors is offered.

Details of the Hands-on Training in Pain Relief and Palliative Care

Nurses	No	Doctors	No
Government sector	36	Government sector	18
Private	10	Private sector	3
RCC	5		
Total	51	Total	31

As a result of these training programme 4 new peripheral centers pain relief have been started. Doctors trained at RCC are managing the following peripheral centres.

Pain clinic, ECDC, Palakkad - Dr. Kalavathy

Pain clinic, District Hospital, Kollam - Dr. Jinen

Pain clinic, District Hospital, Ernakulam - Dr. Vinod Kumar, Dr. Cleetus

Pain clinic, District Hospital, Pathanamthitta, Kozhenchery-

Dr. Ajayakumar

Pain clinic, District Hospital, Palakkad - Dr. Sujith J.S

Pain clinic, Carithas Hospital, Kottayam - Dr. K.M. Radhakrishnan

Improved Morphine Availability

A seminar on morphine availability was organised on 9th June 1999. Representatives from RCC and its peripheral centres, the Drugs Controller, Health Secretary, DHS, DME, staff of College of Pharmaceutical Sciences and Excise Officials, trainee Doctors and Nurses from various districts of Kerala participated. Kerala has adopted simplified narcotic drug licensing regulation to facilitate easy availability of oral morphine for cancer patients. In the last two years there was no incidence of non-availability of oral morphine in RCC. Liquid morphine has been made available in one more strength (10 mg/ml). Steps have been taken to start manufacture of capsules of morphine sulphate in collaboration with the College of Pharmaceutical Sciences.

Visitors:

Ms. Annmarie Laffaerty, Senior Nurse, St. Christopher's Hospice, London, spent 3 weeks in June 1999 at the Palliative Care Centre.

Ms. Helen Pasant, Nurse consultant-cum-practitioner from UK, taught complementary therapies. (She was sponsored by Cancer Relief India).

Ms. Sheila Gaybow - nurse consultant from UK, visited the Palliative Care Centre and donated 2 syringe pumps, several books and a pneumatic compression pump (for lymphoedema management). [Walker, Water bed, Sleeves, Bandages, Geezer etc. have also been made available by generous donations from other well wishers].

Ms. Gilly Burn, Founder, Cancer Relief India

5. Ms. Trisha Castanheira - Senior Nurse, Birmingham Heartland and Solihull Hospital.
6. Ms. Liss Parsons, matron of John Taylor Hospice, Birmingham.

Award/Honours/Positions held/Training etc.

Dr. P.T. Latha

1. Awarded PhD by Kerala University for her thesis "Psychosocial Adjuvants of Female Cancer patients in Southern Districts of Kerala.
2. Elected as Executive Member of IAPC

Ms. Kumari Thamkom

1. Elected as Executive Member of IAPC
2. Nominated as one of the Executive Member - "Quality Assurance in Palliative Care"
3. Editorial board member - Indian Journal of Palliative Care.
4. Foundation course (as faculty) on Palliative Care, Calicut.

Conferences, etc. attended - (Chapter III)

Papers presented - (Chapter IV)

Papers published - (Chapter V)

DIVISION OF BLOOD BANK

Dr. Jayalekshmi P.	-	R.M.O
Mr. Meera Sahib P.	-	Senior Scientific Officer
Mrs. Ganga Devi C.	-	Senior Technician

During the reporting year there was an increase in the number of blood donors and component preparations of packed red cells, platelet rich plasma. Apheresis unit was commissioned on 20/10/99 by Sri. A.C. Shanmughadas, Hon.ble Minister of Health, Kerala.

Activities

Two weeks training was given to 10 BSc MLT students from School of Medical Sciences, M.G. University.

The following blood grouping camps were conducted:

- 2/4/1999 - College of Engineering, Trivandrum, 149 peoples were grouped
- 3/4/1999 - Regional Cancer Centre, Trivandrum, 25 peoples from Vayakti Vikas Kendra were grouped.
- 30/9/1999 - College of Engineering, Trivandrum, 222 peoples were grouped.
- 22/1/2000 - Kochuveli School, Trivandrum, 86 peoples were grouped.

Mr. P. Moora Sahib was elected as Treasurer ISBTI (Kerala Chapter)

Blood Bank Statistics (01/04/1999 to 31/03/2000)

Blood grouping	-	18000
Cross matching	-	6374
Blood donors	-	5024
Hbs Ag +ve	-	123
HIV +ve	-	4
HCV +ve	-	3
Hbs Ag (patients)	-	5284
Hbg Ag +ve	-	324
HIV (patients)	-	3804
HIV +ve	-	7

Components Prepared

Packed Red Cells (PRC)	-	4039
Platelet Rich Plasma (PRP)	-	2849
Single Donor Plasma (SDP)	-	271
Platelet pheresis	-	134

Conferences attended (Chapter - III)

DIVISION OF CYTOPATHOLOGY

Dr. N.Sreedevi Amma	-	Addl. Director & Professor
Dr. B. Chandralekha	-	Professor
Dr. Elizabeth K.Abraham	-	Professor
Dr. Jayasree K	-	Assoc. Professor
Dr. Rekha A. Nair	-	Asst. Professor
Dr. Raveendran Pillai K	-	Asst. Professor
Dr. Anitha Mathews	-	Asst. Professor
Dr. Thara Somanathan	-	Lecturer
Dr. Nileena Nayak	-	Lecturer
Dr. Laxminarayanan	-	Asst. Professor
Sri K.Sujathan	-	Cytotechnologist

The most important functions of this Division is microscopic confirmation of diagnosis by cytology, histopathology and haematopathology. In addition to the above the staff participated in the daily noon clinic, monthly special clinic, cytopathologic conferences and other academic activities of the centre.

Diagnostic Services

Gynaec Cytology

Cervical smears were examined from 2186 cases of which 1273 were from various projects which included a comparative study of pap smear, cervicoscopy, colposcopy and biopsy. 913 cases were from hospital clinic. High grade squamous intraepithelial lesions were reported from 25 cases (6 from hospital cases and 19 from project cases). 52 cases of invasive carcinomas were reported (40 from hospital cases and 12 from project cases).

Non-Gynaec and Aspiration Cytology

From a total of 6608 FNAs, 1784 malignancies were diagnosed. The major sites of aspiration were lymph nodes (1872) thyroid (1697), and breast (1164). Total number of malignancies at various sites is depicted in Fig. I. Some of the rare and interesting tumours diagnosed by cytology are granulocytic sarcoma of orbit, splenic metastasis from papillary serous carcinoma from ovary, mycosis fungoides and Langerhan's cell histiocytosis metastatic to lymph node. FNA slides of 63 cases from various early cancer detection centres, were reviewed of which nine were malignancies.

Fluid Cytology

1298 samples of aspirated fluids from body cavities and natural secretions were examined. Maximum number of samples were CSF (540) from acute leukaemia cases.

Sputum Cytology

Sputum samples were examined from 1131 patients, by collecting 3-5 samples from each patient, and making 2-3 smears from each sample. A total of 60 malignancies were reported. These included adenocarcinomas (32), squamous cell carcinomas (7), Small cell anaplastic carcinoma (8) and poorly differentiated carcinoma, Non small cell type (3). Twenty cases were reported as suspicious of malignancy.

Histopathology

Histopathological examinations were done in 6769 cases of which 4251 cases were surgical specimens from the centre and 2518 were review slides of patients referred from other hospitals. Immunohistochemical staining were done in 873 cases. Frozen section facilities were provided to 50 cases. A total of 4383 malignancies were reported. The predominant sites of malignancy were oral cavity, breast, cervix GIT and lymph node (Fig 1a, b & c).

Some of the rare and interesting lesions were histiocytosis involving thyroid gland and lymph node, endometriosis of large intestine, malignant paraganglioma, sertoli-leydig cell tumour ovary with heterologous (Rhabdomyoblastic) element and bone marrow metastasis. Malignant Rhabdoid tumour uterus, squamous cell carcinoma arising in cystosarcoma phylloides breast, peripheral ameloblastic carcinoma oral cavity, malignant myoepithelioma tongue and epithelial-myoepithelial carcinoma salivary gland.

Haematopathology

Materials studied include 2195 bone marrow aspirates and imprints and 1000 peripheral smears. There were 563 malignancies of which the most predominant was Acute Leukaemias. Acute Lymphoblastic Leukaemias were higher than Acute Myeloid Leukaemias. Special stains for typing leukemias included POX, PAS, NSE and LAP. Immunophenotyping using antibodies to CD19, CD7 and CD33 were done for 78 paediatric and 25 adult acute leukaemias. In paediatric ALL, 38 were of B phenotype and 7 were of T phenotype. 12 blasts crisis of chronic myeloid leukemias were diagnosed. Rare cases include Sezary syndrome (2), Hairy cell leukemia (2), Plasma cell leukemia (1), Eosinophilic leukemia (1) and prolymphocytic leukemia (1).

Academic activities

The staff of this division have participated in the daily morning clinics and monthly special clinics and other academic activities. Some of the staff were invited to conduct CME's/workshops/ seminars or to give orations in different centre in India. Full time cytotechnician and cytotechnologist training courses of 6 months and 1 year duration respectively were included as part of man power generation in cancer control activities. This division is accredited by Indian Academy of Cytologists (I.A.C.) for diagnostic and examination purposes.

We are also involved in the teaching and training programme of medical and paramedical students of Medical College, Trivandrum and paramedical students of Mahatma Gandhi University, Kottayam. Short term training courses of one month duration were also imparted to pathology post graduates of Dental College, Trivandrum and Medical College, Calicut.

Research projects

- 1. Trivandrum oral cancer screening study project**
(Funded by International Agency for Research on Cancer)
Co-investigator Dr. Elizabeth K Abraham
- 2. ATLAS - Oestrogen and Progesterone receptor estimation of breast cancer**
(Funded by Clinical Trial studies, Oxford, U.K)
Co-investigator Dr. Elizabeth K. Abraham
- 3. Open labelled single group study into the effect of M4 and G4 nordihydroguaiaretic acid (NDGA) derivatives on advanced oral and cervical malignancies**
(Funded by John's Hopkin's University, USA)
Co-investigator Dr. Elizabeth K. Abraham
- 4. Genomic instability in breast cancer**
(Funded by Dept. of Science, Technology & Environment, Govt. of Kerala.)
Co-investigator Dr. Elizabeth K. Abraham
- 5. Identification of markers for biological grading of malignant lesions in the bronchopulmonary mucosa**
(Funded by Dept. of Science, Technology & Environment)
Investigator Dr. Ravindran Pillai

6. **Inter observer variations and performance augmentation in cervical cytology**

(Funded by IARC, Lyon)

Co-investigator Dr. Raveendran Pillai K.

7. **Isolation of plant lectin and its application in cytopathology**

Investigator K. Sujathan

8. **EBV associated gastric cancer and related pathological methods - Collaborative centre**

(Department of Public Health, Faculty Medicine Kagoshima University, Japan)

Investigator Dr. Jayasree K

Award/Honours/Fellowship/Training

Dr. N. Sreedevi Amma, Member of Indian Academy of Cytologists, Editorial board of Journal of Cytology, IAPM Kerala Chapter, Governing body member of Amala Cancer Hospital Trichur, Governing body member of RCA.

Dr. B. Chandralekha, Member of Indian Academy of Cytologists, IAPM Kerala Chapter, Editorial board of Journal of Cytology, Governing Body member of RCA.

Dr. Elizabeth K. Abraham, Governing body member of RCA, Indian Association of Pathologists and Microbiologists, Indian Academy of Cytologists, IAPM- Kerala Chapter.

Dr. Jayasree K, Indian Association of Pathologists and Microbiologists, Indian Academy of Cytologists, International Academy Pathologists Indian Division, ISBTI, IAPM-Kerala Chapter.

Dr. Rekha A. Nair, Indian Association of Pathologists and Microbiologists, Indian Academy of Cytologists, IAPM- Kerala Chapter.

Dr. Anitha Mathews, Indian Association of Pathologists and Microbiologists, IAPM- Kerala Chapter, Indian Academy of Cytologists.

Dr. Thara Somanathan, Indian Association of Pathologists and Microbiologists, IAPM- Kerala Chapter, Indian Academy of Cytologists.

Dr. Nileena Nayak, Indian Academy of Cytologists (IAC), Indian Association of Pathologists and Microbiologists (IAPM), IAPM- Kerala Chapter.

Shri. K. Sujathan, Member of IABMS, Indian Society of Cell Biologists.

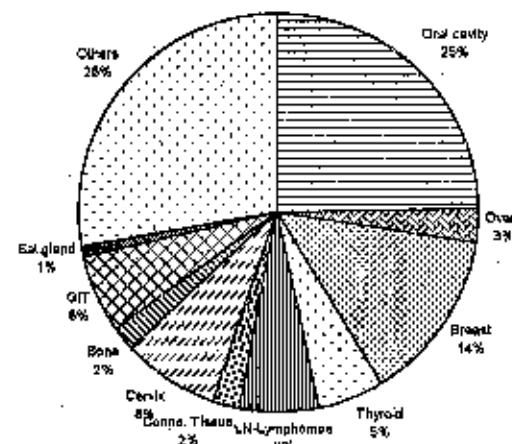
Dr. Ravindran Pillai K, Member of IABMS.

Conferences, etc. attended - (Chapter III)

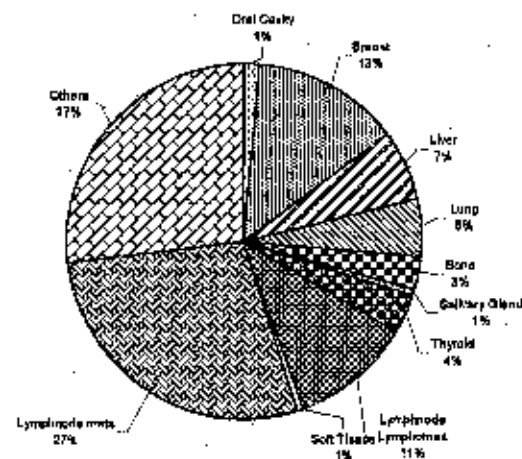
Papers presented - (Chapter IV)

Papers published - (Chapter V)

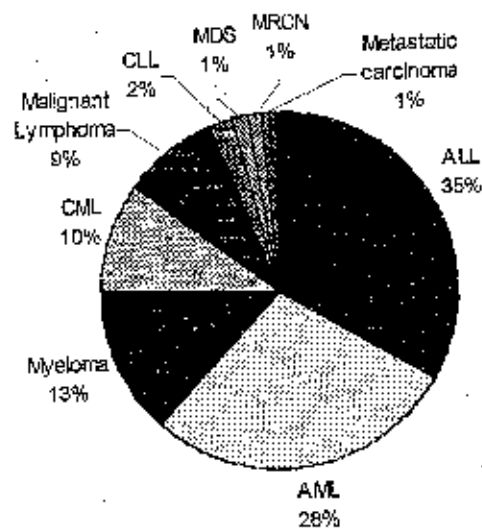
Fig. 1 : Malignant Leisions in Major Sites
a. Histopathology (n = 4389)



b. Aspiriation Cytology (n = 1784)



c. Hematological Malignancies



DIVISION OF IMAGEOLOGY

- Dr. K. Sasidharan - Professor & Head (up to 31.5.99)
- Dr. K. Ramachandran - Professor & Head (took charge on 1.6.99)
- Dr. A.S. Krishnakumar - Assoc. Professor
- Dr. Jacob Varghese - Lecturer (Joined duty on 10/9/99)
- Dr. Manoj KS - Lecturer (Joined duty on 1/1/2000)

Diagnostic and interventional studies done during the period under report are as follows:-

X-ray	-	13,793
IVP	-	4
X-ray tomography	-	12
Barium swallow	-	172
Barium meal	-	10
Myelogram	-	10
Mammogram single	-	238
Mammogram double	-	803
CT Scan	-	5155
C.T. & guided procedures	-	160
Ultrasound	-	5961
Doppler studies	-	220
Ultrasound Guided FNAC	-	65

Academic activities

Six weeks training in ultrasonography for post graduate degree/diploma holders continued this year and 10 candidates completed the training. Teaching of undergraduates and post graduates on basic principles of modern imaging techniques continued. The film reading sessions every day morning and the monthly meeting of Trivandrum Radiology Club provided opportunities for discussion of interesting and problematic cases for diagnosis. We added several more interesting and rare cases to our film library.

Dr. Ramachandran K was examiner for MD Radiodiagnosis & DMR of Dr. MGR Medical University at Madurai and Chennai.

Conferences, etc. attended - (Chapter III)

Papers presented - (Chapter IV)

Papers published - (Chapter V)

DIVISION OF NUCLEAR MEDICINE

Dr. V.M. Pradeep - Assoc. Professor & Head
 Dr. A Sreekumar - Asst. Professor

This division provides diagnostic and therapeutic facilities using open radioactive sources. The centre now attracts a large group of patients who come from various districts of Kerala as well as South Tamil Nadu and Karnataka, Maldives and Sri Lanka. The work in this division includes in-vitro assays, various types of scans, and treatment for Thyrotoxicosis and thyroid cancer as well as treatment of bone pain. This is the only centre in the State that provides high-dose therapy using radioactive sources. The in-vitro assay section was the first of its kind to start functioning in the State. Now the assay section deals with over 50,000 patients annually. This division also participates in several teaching and other academic activities.

Thyroid clinic

Thyroid disorders constitute the majority of patients coming to the Nuclear Medicine Division. Facilities for comprehensive diagnostic and therapeutic options for various thyroid disorders are available. These include thyroid scanning, ultrasonography, in-vitro assays, and radioiodine therapy. 15281 patients attended the thyroid clinic for evaluation. Out of this, 7726 cases attended the thyroid clinic as new cases with direct referrals and follow-up cases. These were primarily cases of Ca Thyroid and Thyrotoxicosis. The other cases were referred for various investigations.

Table 1 Breakup of thyroid investigations

Category	Number
Thyroid scans	2,255
Thyroid uptake	1,624
Thyroid ultrasound	549
Thyrotoxicosis	184
Ca. thyroid	399

Thyroid scans are done with radioiodine (I-131), technetium (Tc 99m). Large dose, whole body radiolodine scans are done for Ca. Thyroid. Both rectilinear scanner and gamma camera are used for thyroid scanning. An ECIL uptake system is used for thyroid uptake studies.

Immunoassay

The immunoassay section performed 50,289 assays of thyroid hormones, tumour markers and miscellaneous assays. The break up is as shown below. These included cases for thyroid evaluation, tumour markers, and other assays. There were 29676 cases for routine thyroid function tests.

Table 2. Breakup of immunoassays

Sl. No.	Assay	Number
1.	T3	9,892
2.	T4	9,892
3.	TSH	9,892
4.	HCG	8,270
5.	AFP	1,304
6.	CEA	1,785
7.	Ca-125	1,513
8.	FT3	631
9.	FT4	631
10.	ATG	492
11.	AMC	492
12.	Cortisol	310
13.	GH	207
14.	PRG	30
15.	Testosterone	357
16.	17 OH progesterone	141
17.	TG	1,617
18.	FSH	557
19.	LH	435
20.	PRL	748
21.	PSA	539
22.	PTH	462
23.	ACTH	92

Imaging (Gamma Camera)

This division has a Siemens Gamma Camera, Basicam Model with a microdelta computer. This equipment is used for static and dynamic scintigraphy. Bone scans for cancer patients form the main

work on this instrument. Dynamic renal studies including pediatric renal evaluation are the second most important. Tetrofosmin Imaging was introduced recently. Technetium for the purpose of these scans is eluted from Molybdenum using Mo-Tc generator from BARC.

Radionuclide scans on the gamma camera were as follows.

Bone	-	1,090
Renal	-	348
Liver	-	18
Meckel's	-	1
Tetrofosmin	-	5

Radionuclide therapy

Radionuclide therapy section of Nuclear Medicine is one of the largest in the country. Radioiodine therapy is routinely given for Thyrotoxicosis and Ca. Thyroid. The division has a full-fledged radionuclide therapy ward with delay tank for the treatment of thyroid cancer. Therapy was given for 184 cases of Thyrotoxicosis and 208 cases of Ca thyroid. The division has facilities for bone pain palliation using 89-Sr.

Academic activities

This division is involved in the teaching activities for Medical and Paramedical students. We also render guidance and assistance to the thesis work of post graduate students of this centre and Medical College. This division participates in the various research projects also.

Dr. A. Sreekumar Deputed for DMR course, Radiation Medicine Centre, Mumbai

Conferences, etc. attended - (Chapter III)

Papers presented - (Chapter IV)

Papers published - (Chapter V)

DIVISION OF RADIATION PHYSICS

Dr. V. Padmanabhan	Professor
Sri. C.A. Davis	Assoc. Professor
Sri. Thayal Singh Elias	Asst. Professor
Dr. Raghuram .K. Nair	Asst. Professor
Dr. L.S. ArunKumar	Asst. Professor (upto 15/06/99)
Sri. P. Raghukumar	Lecturer
Sri. B. Saju	Lecturer (Joined on 3/9/99)

Highlights of activities

Clinical Physics

Calibration of Radiotherapy equipments
 Quality Assurance
 Treatment planning
 Dose Computation
 Radiation Safety in Radiotherapy, Imageology and Nuclear Medicine.
 Intercomparison studies using TLD(WHO/BARC)

Daily maintenance, checking and repair of all teletherapy and brachytherapy equipments.

Patient Services

No. of patients

External Beam Radiotherapy	:	6559
Brachytherapy	:	785
Conventional		
Interstitial implantation	:	83
Intracavitary implantation - Oesophagus	:	36
Mould	:	11
Manual Afterloading - Gynac	:	71
Selectron LDR	:	253
Micro-Selectron HDR		
Gynac	:	295
Oesophagus	:	20
Bronchus	:	3
Anal Canal	:	3
Mould	:	10
Total	:	7344

Mould Room		
Orfit shell	:	489
Acqua plast	:	23
Pop shell & Head Rest	:	25
Custom - made blocks	:	4
Mould	:	11
Wax bolus	:	90
Bite - block	:	200
Total	:	842

Academic Activities

Teaching and training in Medical Physics were imparted to the following categories of students.

1. Diploma in Radiological Technology(DRT)
2. B.Sc. (MLT), DMLT
3. B.Sc. Nursing
4. MSc Nursing
5. MBBS
6. DMRT
7. DMRD
8. MDS(Oral Radiology)
9. MD Radiotherapy
10. MD & Dip NB (Radiodiagnosis)

Training Programme

Conducted DRT refresher programme upto March 2000 a total of 78 students underwent training in Imageology/Nuclear Medicine and 22 students in Radiation Physics/Radiotherapy. Dr. Raghuram K. Nair, & Dr. K. Ramachandran Co ordinated the programme.

Research Projects (completed) .

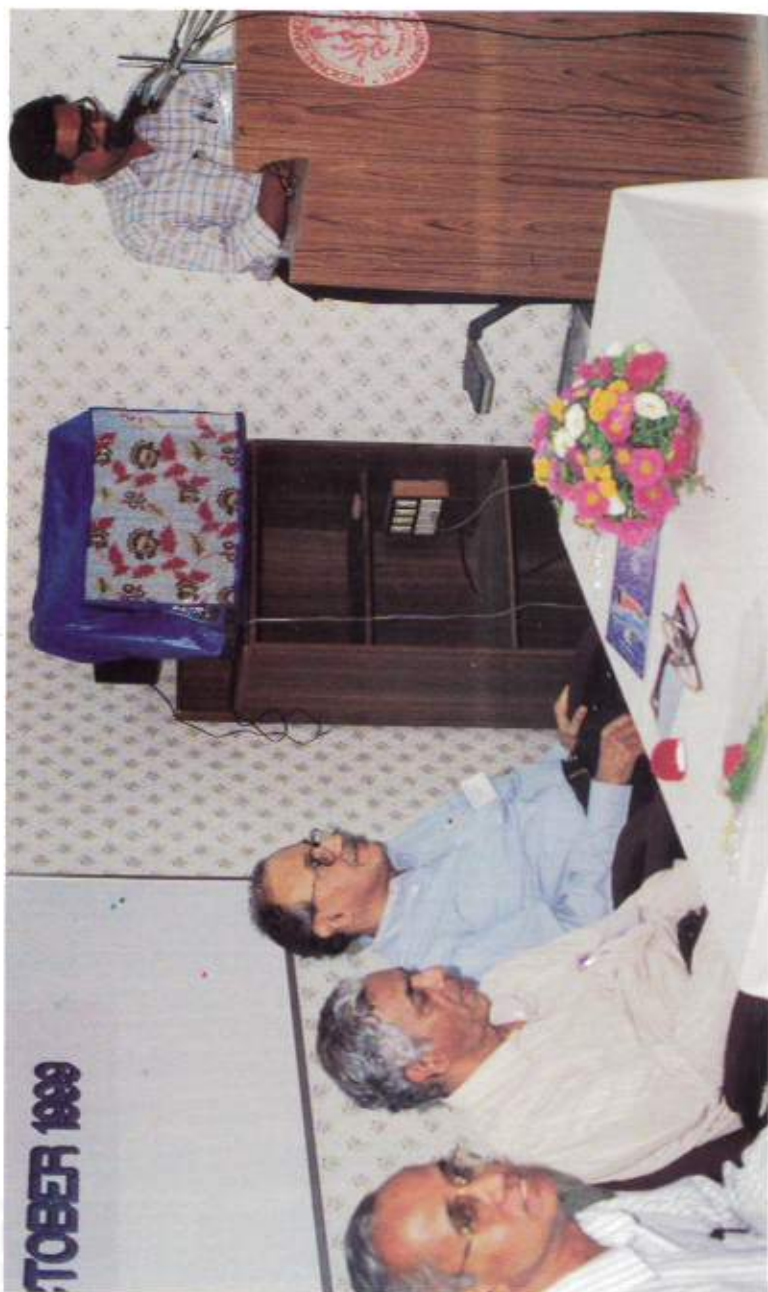
1. **Quality control and acceptance test of radiotherapy Simulator Mr.O.Pradeep and Mr. J.S. Sunil Raj July 1999**
Guide Dr. Raghuram K. Nair.

All quality control and acceptance tests satisfied the prescribed requirements at the time of installation of the New Simulator, Siemens Simview 3000

2. **Natural Background Radiation Registry(NBRR)-Physics studies (Funded by the Dept. of Atomic Energy, Govt. of India)**
TLD measurement and SSNTD Dosimetry work nearing completion.



International Conference "Radiobiology 2000" was held at RCC on 17-19 February 2000. L - R Dr. V.N. Bhattathiri, Dr. V. Padmanabhan, Dr. Lazar Mathew, Prof. P.N. Sreevasthava, Dr. M. Krishnan Nair, Dr. Sreelan Groth.



CME on Safety Accuracy Quality was conducted in RCC from 9 to 11th October, 1999.
Dr. V.N. Bhattathiri welcoming Dr. V. Padmanabhan, Dr. K.S. Parthasarathy and Dr. M. Krishnan Nair.

Research Projects (ongoing)

- Dosimetry of early head and neck cancers, mantle field treatment and cervical cancer with special reference to radiation protection.**
(Funded by A.E.R.B, Mumbai)

Principal Investigator Mr. T.S Elias
Co-Investigator: Dr. V.Padmanabhan, Mr. C.A Davis
Up to March 2000, TLD dosimetry done in 120 cases.
- Development of Indigenous after loader system in the treatment of Ca Cx.**
(Funded by Dept. of Science and Technology, New Delhi and Regional Cancer Centre, Trivandrum)

Principal Investigator Mr. TS Elias
Co Investigators Dr. V.Padmanabhan, Mr. C.A Davis
Dr. M.Krishnan Nair

The system has been developed. It will be evaluated by BARC officials before using for clinical studies.
- Dose measurements in patients undergoing diagnostic X ray examination including special investigation**
(Funded by A.E.R.B, Mumbai)

Principal Investigator Dr. Raghuram .K. Nair
Co Investigator Dr.L.S Arun Kumar, Dr. V.Padmanabhan
Dr. M. Krishnan Nair

Studies were completed for 384 patients for organ doses. 312 patients were covered in Simulation procedures. More patients are to be included in both studies and additional data acquired in special investigations
- A phase III open labelled single group study into the effect of Foscan medicated PDT on recurrent squamous cell cancers of oral cavity.**
(International trial funded by M/s Quarta Nova, USA)

8 treatments (6 patients) given in this trial at this centre.
Co-Investigator Mr. C A Davis
- A multicentric open labelled single and multiple dose study for Foscan mediated PDT for the palliative therapy of**

recurrent, refractory or second primary SCC of head and neck in patients considered to be incurable by surgery or radiotherapy.

(Funding agency : Nova Scotia, UK)

39 treatments (31 patients) given in this trial at this centre.

Co-Investigator Mr. C A Davis

Research Projects (New)

1. Fabrication of beam direction device for external beam therapy

Principal Investigator Mr. T.S.Elias

Co-Investigator Mr.C.A.Davis

Dr. V.Padmanabhan, Dr. B. Rajan

1 year project sanctioned by STEC, Govt of Kerala, December, 1999.

2. Development of indigenous software controlled remote afterloading Micro High Dose Rate system in Brachytherapy (Project under Consideration of DST, New Delhi)

Principal Investigator Mr. T.S.Elias.

Co-Investigator Dr. M.Krishnan Nair,
Dr. V.Padmanabhan, Mr.C.A.Davis
and Dr. P.G. Jayaprakash

Meetings Organised

1. Dr. R. Chidambaram, Chairman AEC & Secretary DAE. Switched on the Siemens Simview 3000 Simulator and the microselectron HDR, Nucletron brachytherapy system.
2. Dr. Murali T.K. Nair, Texas. Gave two invited talks. Stereotactic radiosurgery and Ultrasound guided prostate Implants (TRUS) using I125 seeds on 11.6.99 and 16.6.99.
3. CME / workshop - Safety Accuracy Quality (SAQ) in Radiotherapy for Radiation technologists Regional Cancer Centre, Trivandrum. Inauguration by Dr. K.S. Parthasarathy Secretary AERB, Mumbai 9-10-99 to 11-10-99.
4. International Conference on Radiobiology 2000, at Priyadarsini Planetarium, Trivandrum February, 17 -19, 2000.

Awards / Honours/ Fellowship/ Nominations / Training.

Dr. V.Padmanabhan

1. DMRT (Radiotherapy) Examiner - The T.N Dr. MGR Medical University Chennai 9/4/99.
2. MD/DMRD (Radiodiagnosis) Examiner - University of Kerala, Medical College, Dept. of Radiodiagnosis. 8.6.99 & 10.12.99.
3. Chairman, International Conference on Radiobiology, RCC, TVM & ISRB., February 17-19, 2000.
4. President and Editor SAQ- CME, Regional Cancer Centre, Trivandrum, October 9-11, 2000.
5. Executive Committee Member AMPI Mumbai. 1999-2001.
6. President KAMP. 2000-2002

Mr. C.A. Davis

1. Examiner-The Tamilnadu Dr. M.G.R Medical University, Chennai, for MD Radiotherapy and DMRD, April 1999.
2. Executive Secretary - International Conference on Radiation Biology, "Radiobiology 2000" Organised by Indian Society of Radiation Biology and Regional Cancer Centre at Trivandrum during 17 - 19 February, 2000.
3. Executive Committee Member - Indian Society for Radiation Physicists.
4. Treasurer - CME programme for Radiation Technologists, "Safety Accuracy and Quality in Radiotherapy", held during October 9-11, 99 at Regional Cancer Centre, Trivandrum.

Dr. Raghu Ram. K.Nair

NBRR Radiation Dosimetry Training at Kinki University, Osaka, Japan 6-22 Nov 1999.

Mr. P.Raghu Kumar

1. Examiner - M.G University Kottayam, BSc MRT Course, March 13 - 15, 2000.
2. Ph.D. registration (2000) under Dr. V Padmanabhan (guide) M.G. University Kottayam.

Ph.D. Thesis

Mr. L.S Arunkumar was awarded Ph.D. degree by the University of Kerala for his thesis entitled " Design, fabrication and dosimetric

aspects of beam modifying devices in Radiotherapy (1999) after the Open defence conducted on 24-12-99.

The major observations in this study are:-

In the present work the design, fabrication and dosimetry of wedges, both conventional and non-conventional values were carried out, using two materials lead and lipowitz for 4MV X-rays and Co60 gamma radiation. Dosimetry of each wedge was worked out using small volume ion chamber and water phantom system for Co60 gamma radiation and for 4MV X-rays. A total of 23 wedges were fabricated.

The following dosimetric parameters were analysed for the acceptability of the wedges. They were percentage depth dose (PDD), Isodose curves, AB Profiles, GT Profiles, Field Flatness, Field symmetry, Wedge output factors.

Values of the above dosimetric parameters were found to be acceptable for routine treatment planning for patients undergoing radiotherapy.

Conferences, etc. attended - (Chapter III)

Papers presented - (Chapter IV)

Papers published - (Chapter V)

DIVISION OF CANCER EPIDEMIOLOGY AND CLINICAL RESEARCH

Dr. Cherian Varghese Assoc. Professor of Cancer
Epidemiology & Clinical Research

Dr. Aleyamma Mathew Asst. Professor of Computational
Statistics & Epidemiology

Ms. Padmakumary Amma Lecturer in Biostatistics

The Division of Cancer Epidemiology and Clinical Research runs the Hospital Cancer Registry, Population based cancer registries in Trivandrum and Karunagapally and conducts epidemiological and clinical cancer research. This Division is the nodal point for planning, implementation and evaluation of cancer control programmes and provides consultancy for various agencies.

Training and analytical support is provided for postgraduate students of the campus and to students from Loyola College, Medical Documentation and Master of Public Health students from MG University, Kottayam.

District Cancer Care Centre, Kozhencherry, Pathanamthitta:

A joint proposal put up from this Division and the District Hospital at Kozhencherry has been implemented in full. A District Cancer Care Centre with facilities for early detection of cancer, investigations, chemotherapy and palliative care has been established. This is the first of its kind in integrating cancer care in health services in India and will serve as a model centre.

Malabar Cancer Control Programme:

Funding assistance has been received from the UNFPA for the Malabar Cancer Control Programme. This programme will be the first large scale organised screening programme for cervical cancer in India. The programme will cover selected Taluks in Kannur, Kasargod and Wayanad Districts. The project will be undertaken in collaboration with the existing health care services and Voluntary organizations.

Risk factors for common cancers:

The Kerala Transport Development Finance Corporation has funded a project for identifying risk factors for cancer and hospital information computer network. Information from cancer patients and control subjects are being collected for studying the risk factors:

OncoNET Kerala:

The collaborative project submitted by this Division, Division of Information Systems and the ER&DCI, Trivandrum has been funded by the Ministry of Information Technology. Realization of this Telemedicine project will provide services to patients of this centre, attending the various peripheral centres in Kerala. The Interactive website of RCC is being developed and will provide services for early detection of cancer, advice for investigations and treatment and palliative care.

Ongoing projects:

1. Molecular Epidemiology of Paediatric Leukaemia and Lymphoma in Kerala, India.

(Funding agency Key Kendall Leukaemia Fund, UK)

Investigators Dr. Cherian Varghese
Dr. Kusumakumary,
Dr. Thomas Abraham, Dr. Rekha,
Dr. M. Krishnan Nair.

Collaborators Dr. Gareth Morgan, Prof. R. Cartwright
(Uni. of Leeds)

A unique attempt to study the risk factors and molecular markers of paediatric acute Leukaemia in Kerala, India. This study has recruited 188 cases and 200 controls so far.

2. Pesticide exposure and breast cancer.

(Funding agency National Cancer Institute, USA).

Investigators Dr. Cherian Varghese
Dr. Aleyamma Mathew
Dr. Iqbal Ahammed
Dr. M. Krishnan Nair.

Collaborators Dr. Susan Sturgeon
Dr. Reshmi Sinha (NCI, USA)

Analysis of biological samples collected in the study is in progress.

3. Occupation and cancer.

(Funding agency International Agency for Research on Cancer, Lyon).

Investigators Dr. Cherian Varghese,
Dr. Aleyamma Mathew

Collaborator Dr. P. Boffetta
(Unit of Environmental Epidemiology,
IARC, Lyon)

The data management and analysis of this study are in progress.

4. Case-control studies

(Funding agency: Kerala Transport Development Corporation)

Investigators Dr. Cherian Varghese,
Dr. M. Krishnan Nair

Data collection is in progress for breast cancer, cervix cancer, colon cancer, pancreas and oesophageal cancer. Structured interview schedules are used to collect dietary data, tobacco, alcohol habits, reproductive factors and socio-economic variables.

5. Surveillance System for Monitoring Cancer Incidence and Mortality in Trivandrum

(Funding agency: International Agency for Research on Cancer, Unit of Descriptive Epidemiology)

Investigators Dr. Cherian Varghese
Dr. M. Krishnan Nair

6. Telemedicine Project

(Funding agency: Ministry of Information Technology, Govt. of India)

Investigators Dr. Cherian Varghese, Mr. Manoj G
Dr. M. Krishnan Nair

Collaborator ER & DCI, Trivandrum.

7. Operation Research Programme - Cancer Control

(Funded by UNFPA)

Investigators Dr. Cherian Varghese
Dr. Sreedevi Amma,
Dr. Chandralekha, Dr. M. Krishnan Nair.

Collaborators Various Divisions of RCC

Hospital Cancer Registry

The Hospital Cancer Registry has been covering the Regional Cancer Center and Medical College Hospitals in Trivandrum since 1982. As the number of cases in RCC has increased considerably, it has been decided to limit the HCR to RCC, Trivandrum. The Trivandrum Population based cancer registry is collecting data from the Medical

College Hospitals, Trivandrum. The staff of HCR participated in the academic and research activities of RCC and the database of HCR is a source for various research programs.

Cancer pattern in RCC, Trivandrum, in 1997

Six thousand nine hundred and ninety two (6992) cases were reported during the year 1997. The distribution of cancer cases with respect to site, age and sex are given in Tables 1 & 2. The male:female ratio was 1.1:1. The peak age frequency in males was observed in the 7th decade and in females in the 6th decade. The age distribution of males and females are shown in Fig. 1. Ninety two percentage of cases had microscope verification of diagnosis. In the 4983 previously untreated cases 13 % were in the early stages. Among these who reported for treatment 60% were treated with a curative intent. Analysis by type of showed that 38.6% received radiation as the only form of treatment and 56.5% in combination with other forms of therapy.

Leading Cancers

Lung was the commonest site of cancer among males and among females it was breast cancer. The system wise distribution of cancer is shown in Fig. 2. The ten leading sites of cancer in men and women are shown in Figs. 3 and 4.

Childhood Cancers

Childhood cancers (0-14 yrs) formed 4.45% (311) of the total cancer cases. The leading sites were leukaemia 138(44.3%), central nervous system 36(11.58%) and lymphoma 23 (10.61 %).

Trivandrum Cancer Registry (Population Based)

The population based cancer registry of Trivandrum continues to monitor the cancer incidence in Trivandrum Corporation and adjoining community development blocks. Cancer of the lung is the most common site among men and breast cancer is the leading site of cancer among women.

Awards/ Fellowships/Honours/Training

Dr Cherian Varghese

1. IEA Travel Scholarship to present a paper in the International Scientific Meeting of the International Epidemiology Association in Florence, Italy, August 1999.
2. Received a fellowship to pursue doctoral training in Epidemiology, University of Tampere, Finland (1999-2000).

National Faculty Member: VIII Biennial National Conference of ISO99, March 1999, New Delhi.

Dr Aleyamma Mathew

Young scientist award (Smt. Suraj Kali Jain award) for the best published work related to medical statistics, by the Indian Society for Medical Statistics, 1999.

Post-doctoral fellowship, National Institute of Health, Bethesda, Maryland, USA, 2000.

Smt. D. Chandrika.

Medical Records Technician Training course, JIPMER, Pondicherry, TamilNadu (2000).

Association with professional bodies

Dr Cherian Varghese

1. Fellow of the UICC, Geneva
2. Member, International Epidemiology Association
3. Hon. Medical Advisor, Karunya Vishrahnthi Hospice, Kattela, Trivandrum.

Dr Aleyamma Mathew

1. Life member of Indian society for Medical Statistics
2. Member of Indian Association for cancer Research
3. Advisory board member of the Journal of the Academy of clinical microbiologists.
4. Editorial board member of the Regional Cancer Centre House Magazine
5. Member of International WHO's WHO of professional and business women

TABLE 1

REGIONAL CANCER CENTRE - TRIVANDRUM: CANCER CASES OF 1997; AGE BY SITE - MALES

ICD 9	Site	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75+	Total	%
140	Lip	-	-	-	-	-	-	2	1	5	1	3	2	1	1	2	18	0.48	
141	Tongue	-	-	-	-	-	1	7	10	19	36	40	32	32	27	22	10	236	6.34
142	Salivary, GI	-	-	1	3	-	2	3	1	1	-	1	1	5	1	-	3	22	0.59
143	Gum	-	-	-	-	-	-	-	-	2	5	7	11	10	5	5	11	56	1.50
144	Floor of mouth	-	-	-	-	-	-	-	-	4	7	6	9	8	7	2	1	44	1.18
145	Other mouth	-	-	-	-	-	1	4	5	12	35	35	49	40	46	28	26	281	7.55
146	Oropharynx	-	-	-	-	-	-	1	2	3	12	16	23	15	16	16	4	108	2.90
147	Nasopharynx	-	-	-	3	4	3	3	2	3	2	2	2	-	1	1	-	26	0.70
148	Hypopharynx	-	-	-	-	2	1	2	2	3	14	18	25	23	20	11	9	130	3.49
149	Pharynx, etc	-	-	-	-	-	-	-	-	1	1	2	4	2	-	1	-	11	0.30
150	Oesophagus	-	-	-	-	-	-	1	5	6	5	34	36	41	33	25	21	207	5.56
151	Stomach	-	-	-	-	-	-	3	5	8	15	17	15	18	16	10	10	117	3.14
152	Small Intes.	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	2	0.05
153	Colon	-	-	-	-	1	4	2	3	5	8	9	5	5	7	1	3	53	1.42
154	Rectum	-	-	-	-	-	4	-	9	5	6	12	14	12	7	4	6	79	2.12
155	Liver	2	-	-	1	-	3	9	5	11	14	8	17	10	4	7	4	95	2.55
156	Gall bladder	-	-	-	-	-	-	1	1	-	1	1	1	1	1	1	-	8	0.21
157	Pancreas	-	-	-	-	-	-	3	5	1	2	5	2	6	4	1	3	32	0.86

Table 1 Contd.

ICD 9	Site	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75+	Total	%
158	Retroperit	-	-	-	-	-	-	2	-	-	-	1	1	-	-	-	2	6	0.16
160	Nasal cavity	-	-	-	1	-	2	1	2	2	5	1	-	6	2	6	3	31	0.83
161	Larynx	-	-	-	-	-	-	1	4	8	18	25	37	32	35	23	19	202	5.43
162	Lung	-	-	-	-	-	1	1	10	19	38	71	104	115	106	56	28	549	14.75
163	Pleura	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	2	0.05
164	Thymus	-	-	-	1	2	3	2	4	1	-	1	-	1	1	1	-	17	0.46
170	Bone	2	2	5	10	9	5	-	2	-	-	1	-	2	-	1	-	39	1.05
171	Conn. Tissue	3	1	1	1	3	5	5	2	2	5	2	3	5	4	1	1	44	1.18
172	Skin mela	-	-	-	-	-	-	-	-	1	2	-	5	3	1	-	1	13	0.35
173	Skin other	-	-	1	-	-	1	1	1	4	4	7	8	12	8	7	1	55	1.48
175	Breast male	-	-	-	-	-	-	1	1	-	2	2	1	5	-	-	-	12	0.32
185	Prostate	-	-	-	-	1	-	-	-	-	1	3	4	4	16	9	11	49	1.32
186	Testis	2	-	-	2	3	7	7	3	1	5	-	-	1	-	-	-	31	0.83
187	Penis, etc	-	-	-	-	-	1	-	5	2	3	-	3	4	7	3	3	31	0.83
188	Uri. Bladder	-	-	-	-	-	-	3	1	2	8	3	5	10	10	10	11	63	1.69
189	Kidney	2	2	-	-	-	-	-	-	2	2	3	3	1	-	2	1	18	0.48
190	Eye	12	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	14	0.38
191	Brain	7	4	11	4	8	15	9	12	10	7	10	8	4	1	-	1	111	2.98
192	Nervous sy	1	1	1	-	-	-	-	1	1	-	-	-	-	-	-	-	5	0.13
193	Thyroid GI	-	-	2	3	4	7	8	7	16	10	1	2	3	6	5	1	75	2.02

Table 1 Contd....

ICD 9 Site	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75+	Total	%
194 Other endo. Gl	4	3	-	1	-	-	-	-	-	1	-	-	-	1	1	1	12	0.32
195 Ill def. site	3	-	-	-	-	-	1	1	-	-	-	1	1	-	1	1	9	0.24
196 Sec. Lymph N	-	-	-	-	1	3	1	1	6	10	17	16	25	19	12	10	122	3.28
197 Sec. Res. etc	-	-	-	-	-	-	5	1	5	7	7	15	9	4	9	7	69	1.85
198 Sec. Other	-	-	-	-	1	1	1	3	6	8	12	10	8	18	10	8	86	2.31
200 Lymphosarc	3	1	3	6	5	7	5	4	8	7	3	11	5	6	4	3	81	2.18
201 Hodgkins D	2	4	4	1	4	2	1	2	3	4	2	2	3	-	-	2	36	0.97
202 Oth. Lymph	-	2	1	1	1	2	1	5	12	10	9	13	17	10	4	5	93	2.50
203 Mult. Myel	-	-	-	-	-	-	-	2	3	6	6	7	11	6	7	7	55	1.48
204 Leuk. Lymph	34	21	14	24	7	9	6	5	3	1	5	3	6	2	2	1	143	3.84
205 Leuk. Myelo	3	7	6	13	10	10	10	10	6	7	9	9	5	6	6	2	119	3.20
206 Leuk. Monoc.	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	0.03
208 Leuk. Uns	-	-	-	1	-	-	-	1	-	-	-	-	1	-	-	-	3	0.08
	80	48	51	76	67	100	113	147	209	340	415	520	530	465	317	243	3721	

Hospital Cancer Registry - Trivandrum : CANCER CASES OF 1997 : AGE BY SITE - FEMALES

ICD 9 Site	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75+	Total	%
140 Lip	1	-	-	-	-	-	-	1	-	1	1	-	2	4	3	2	15	0.46
141 Tongue	-	-	-	1	1	3	1	3	8	12	10	16	20	22	16	9	122	3.73
142 Salivary, Gl	-	-	-	-	1	1	-	2	-	3	-	7	2	1	1	3	21	0.64
143 Gum	-	-	-	-	-	-	-	-	1	2	4	4	17	9	7	3	47	1.44
144 Floor of mouth	-	-	-	-	-	-	-	-	-	-	-	1	-	1	1	3	6	0.18
145 Other mouth	-	-	-	-	1	-	1	2	4	11	19	31	29	21	18	19	156	4.77
146 Oropharynx	-	-	-	-	-	-	-	1	-	1	-	2	1	1	1	-	7	0.21
147 Nasopharynx	1	-	-	3	2	2	-	1	1	2	-	-	1	-	1	1	15	0.46
148 Hypopharynx	-	-	-	-	-	1	-	2	4	4	1	3	4	1	1	-	21	0.64
149 Pharynx, etc	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	0.03
150 Oesophagus	-	-	-	-	-	1	1	5	3	5	7	9	11	14	5	7	68	2.08
151 Stomach	-	-	-	-	1	-	2	-	4	3	1	2	2	7	6	-	28	0.86
152 Small Intes.	-	-	-	1	-	-	-	-	1	1	3	-	2	-	1	-	9	0.28
153 Colon	-	-	-	-	-	2	1	6	-	1	6	4	3	3	3	-	29	0.89
154 Rectum	-	-	-	1	1	4	2	6	-	4	2	6	9	5	7	2	49	1.50
155 Liver	-	-	-	-	-	1	-	-	-	3	1	1	3	1	-	2	12	0.37
156 Gall bladder	-	-	-	-	-	-	-	-	1	1	3	-	-	1	-	-	6	0.18
157 Pancreas	-	-	-	-	-	-	-	1	2	1	3	1	1	2	-	-	11	0.34

Table 2 Contd....

ICD 9 Site	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75+	Total	%
158 Retroperit	1	-	-	1	-	-	1	1	-	2	-	1	1	1	-	-	9	0.28
160 Nasal cavity	1	-	-	1	-	-	-	3	-	-	2	2	5	2	1	1	18	0.55
161 Larynx	-	-	-	-	-	-	-	-	1	1	1	1	2	2	1	-	9	0.28
162 Lung	-	-	-	-	-	1	1	3	9	3	9	1	6	5	3	2	43	1.31
163 Pleura	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	2	0.06
164 Thymus	1	-	1	-	-	1	-	-	1	-	2	-	-	-	-	-	6	0.18
170 Bone	1	1	7	10	7	1	-	3	2	-	1	-	-	-	-	2	35	1.07
171 Conn. Tissue	3	1	4	3	6	4	8	6	3	2	3	1	2	3	2	2	53	1.62
172 Skin mela	-	-	-	-	-	-	1	1	1	2	2	2	-	-	-	-	9	0.28
173 Skin other	-	-	-	1	1	-	-	1	-	3	2	1	1	-	3	2	15	0.46
174 Breast	-	-	-	-	4	24	64	117	124	143	119	100	65	45	19	15	839	25.65
179 Uterus Nos	-	-	-	-	-	-	-	1	2	-	1	-	1	-	-	-	5	0.15
180 Cervix	-	-	-	-	-	1	10	32	51	73	72	84	67	71	33	30	524	16.02
181 Placenta	-	-	-	-	-	2	-	-	-	-	1	-	-	-	-	-	3	0.09
182 Body Uterus	-	-	-	-	-	1	2	4	4	8	8	13	5	11	3	1	60	1.83
183 Ovary	-	2	4	6	11	7	10	19	26	22	28	21	23	23	8	4	214	6.54
184 Vagina	-	-	-	-	-	-	-	-	2	2	4	2	4	3	4	3	24	0.73
188 Uri. Bladder	-	-	-	-	-	-	-	-	-	1	-	4	-	-	-	-	5	0.15
189 Kidney	6	-	-	-	1	1	-	-	-	2	2	1	1	2	1	-	17	0.52
190 Eye	4	1	-	-	-	-	-	-	-	-	-	1	-	-	-	1	7	0.21

Table 2 Contd....

ICD 9 Site	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75+	Total	%
191 Brain	3	4	7	4	3	5	5	5	7	5	4	5	4	3	-	-	64	1.96
192 Nervous Sy.	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	0.03
193 Thyroid Gl.	-	-	5	7	19	37	35	33	26	19	19	14	10	7	4	1	236	7.21
194 Oth. endo. Gl.	5	-	1	-	-	-	1	1	-	1	-	-	-	-	-	-	9	0.28
195 Ill Def. Sil.	-	-	-	-	-	-	-	-	-	-	-	2	-	-	1	1	4	0.12
196 Sec. Lymph. N	-	-	-	2	-	3	-	3	4	-	6	4	4	2	1	2	31	0.95
197 Sec. Res. Etc	-	-	-	-	-	-	1	8	2	7	13	3	4	10	9	8	65	1.99
198 Sec. Other	-	-	1	-	1	1	-	4	2	4	1	10	8	10	-	4	46	1.41
200 Lymphosarc.	1	-	2	-	1	1	2	1	1	3	2	3	2	2	4	2	27	0.83
201 Hodgkins. D.	-	1	4	1	1	3	3	3	-	2	-	2	-	-	-	-	20	0.61
202 Oth. Lymph.	1	2	2	1	1	1	4	3	5	1	2	4	7	5	5	5	49	1.50
203 Mult. Myel.	-	-	-	-	1	-	-	1	1	4	4	8	3	7	5	2	36	1.10
204 Leuk. Lympha.	18	8	12	10	3	3	4	1	1	6	4	2	1	5	2	1	81	2.48
205 Leuk. Myelo.	1	2	10	5	8	8	5	9	5	6	3	8	2	3	2	1	78	2.38
208 Leuk. Uns.	1	-	1	1	-	-	-	1	-	-	-	-	-	-	-	-	4	0.12
	49	22	61	59	77	120	165	294	310	378	376	387	335	315	182	141	3271	

Fig. 1. Distribution of cancer cases by age group - 1997
 (Male - 3721, Female - 3271, Median age - Male: 56.2, Female : 50.6)

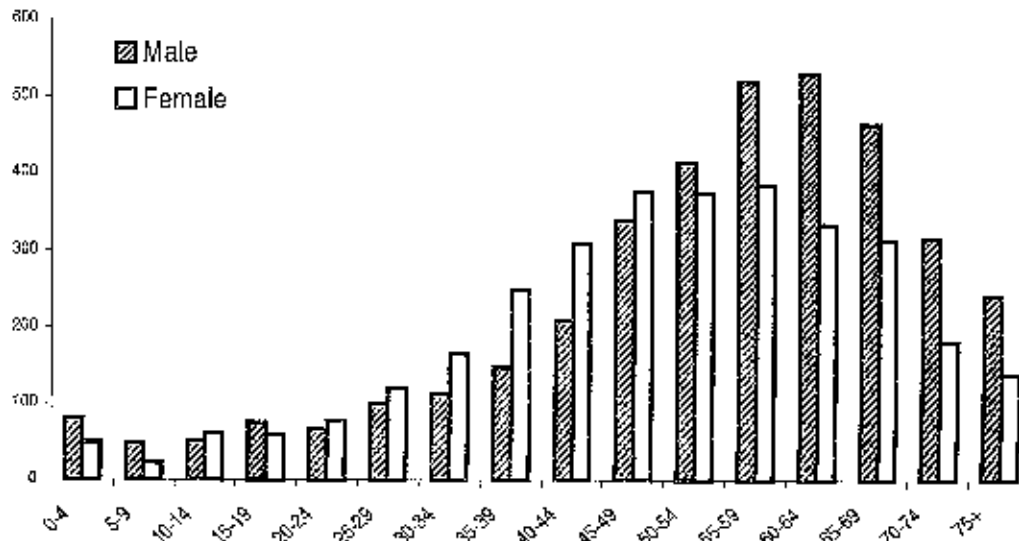


Fig. 2. Hospital Cancer Registry, Trivandrum
 (System-wise distribution of cancer cases - 1997)

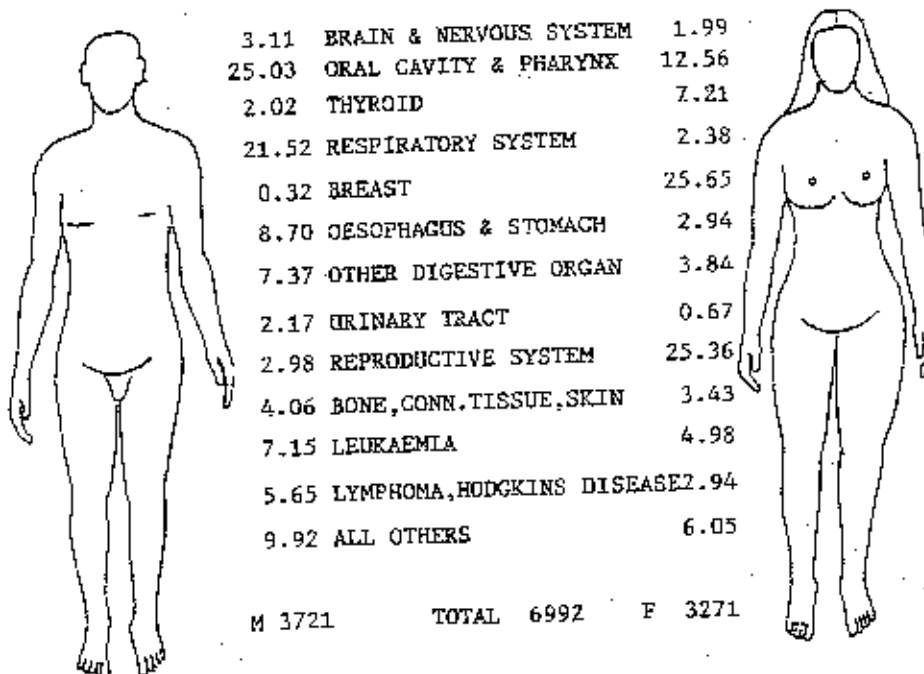
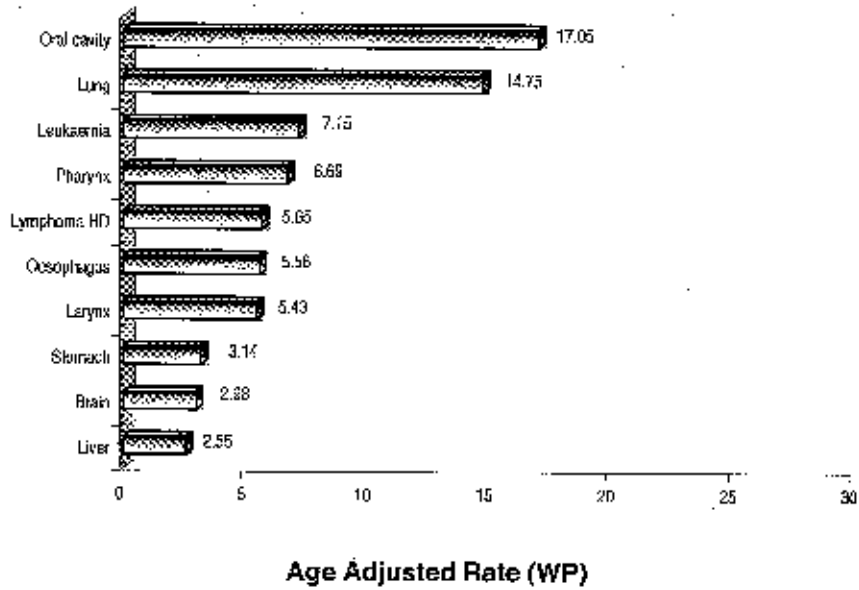
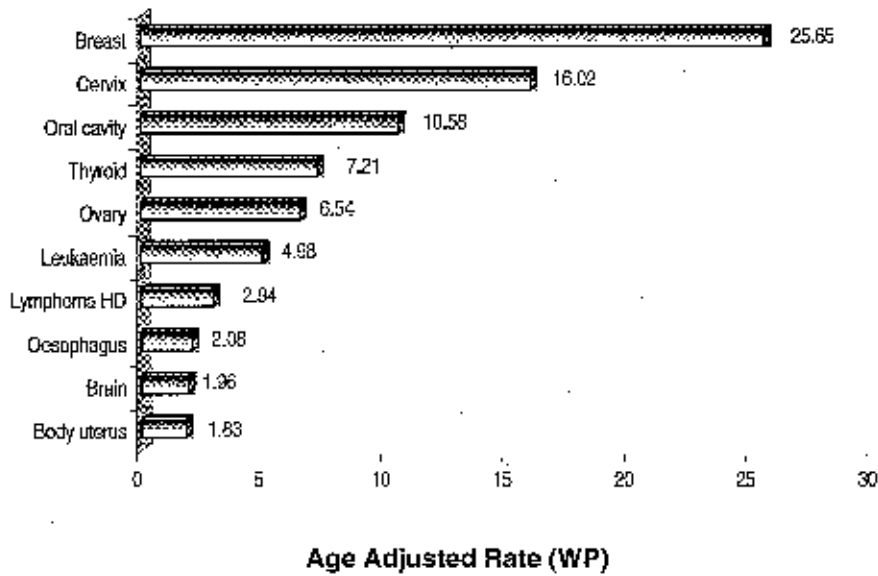


Fig. 3 Leading sites, Trivandrum Cancer Registry (1997) Male



Oral cavity (ICD9 – 140, 141, 143, 144, 145)
 Pharynx (ICD9 – 146, 148, 149)

Fig. 4 Leading sites, Trivandrum Cancer Registry (1997) Female



Oral cavity (ICD9 – 140, 141, 143, 144, 145)

NATURAL BACKGROUND RADIATION CANCER REGISTRY KARUNAGAPPALLY, KOLLAM DISTRICT

(Funded by the Department of Atomic Energy, Govt. of India)

Principal Investigator	Dr. M. Krishnan Nair
Co-Principal Investigator	Dr. N. Sreedevi Amma.
Co-Investigators	Mr. P. Gangadharan Dr. V. Padmanabhan Dr. T. Gangadevi, Dr. Paul Sebastian, Dr. S. Parameswaran, Dr. Jayaprakash Madhavan, Dr. Ravi Ankathil, Dr. V.M. Pradeep, Dr. Cherian Varghese.
Field Office	Vavvakkavu, Karunagappally Taluk
Officer-in-charge	Ms. P. Jayalekshmi (Sociologist),
Cytotechnologist	Mr. K.S. Mani.
Radiation Dosimetry Supervised by	Dr. Raghu Ram K. Nair.

The Natural Background Radiation Cancer Registry is Kerala's first Population Cancer Registry and India's second Rural Cancer Registry. This registry, organised from 01-01-1990 continued to work with the funds from Department of Atomic Energy, Government of India till 1998. The Japanese Health Research Foundation headed by Dr. Sugahara provides partial support for the study from 01-04-1990 onwards. The local panchayat administrative bodies have offered support to the study and the clinic services from next year onwards under People's Plan Programme.

The Karunagappally study is a unique attempt to investigate the cancer occurrence in relation to the Natural Radiation because of availability of a large population and high radiation levels in the same place. The objectives and methodologies of the study were reported in the previous annual reports. The progress and the activities during the current year are given below.

External Gamma Radiation level measurements using portable dosimeters were completed in the whole taluk area. Soil analysis, TLD, CSNTD, Thoron-in-breath measurements were done in selected houses. The detailed analysis of radiation measurements was completed in this year. The cancer registration covers a population of 4 lakhs people. Cancer cases are located by scrutiny of medical records in hospitals in the taluk and Kollam town, Medical college hospital and Regional Cancer Centre at Trivandrum, Pathological laboratories, Vital statistics division of Panchayats and Municipalities by recording cancer deaths and by house visits. Follow up of patients by house visits gave the survival status of the patients. Almost 350 new cancer cases were registered during the current reporting year from all sources. A total of 1637 cancer cases were identified for the 5 year period 1993-1997 in the taluk which gave the crude incidence rate per 100,000 population as 89.5 for males and 75.5 for females. Adjusted to world population these rates were 102.7 for males and 75.5 for females. The cancer pattern among the population showed that lung cancer is the predominant cancer in men and cervix cancer and breast cancer among females. Table 1 gives the system wise distribution of cases among males and females seen during the 5 year period 1993 to 1997.

Table 1. Systemwise distribution of cancer cases during the period of 1993-1997.

Male (%)	System.	Female (%)
16.4	Oral cavity, Pharynx	8.2
11.0	Gastrointestinal	11.3
22.8	Respiratory	4.2
4.3	Bone, Connective Tissue, Skin	1.6
0.1	Breast	20.0
3.6	Genital	25.5
3.4	Urinary System	1.2
2.3	Brain & Nervous system	2.4
1.0	Thyroid & Endocrine	7.7
1.5	Lymphoma, Hodgkins Disease	2.0
1.9	Multiple Myeloma	1.2
3.7	Leukaemia	2.6
16.8	Others	12.1
100.0	Total	100.0

An analysis of cancer incidence data of 1993-'97 vis-à-vis radiation level in Karunagappally taluk has been done. The cancer incidence rates obtained when analysed with regard to radiation levels indicate no marked changes in overall cancer incidence in relation to radiation levels. More person years of observation and evaluation of individual risk levels are needed before cancer incidence data are adequately interpreted with regard to radiation. Therefore Dosimetry studies have been planned and a special sample survey was conducted in 8,000 houses during the year to study the house occupancy factor of the different sections of the population.

Community Cancer Control Activities and Patient Services.

The cancer patient follow-up services, Pap Smear screening programmes, Public awareness programmes were regularly conducted in the community during the year. There were 11 follow-up clinics for cancer patients with attendance of 286 patients, 5 screening programmes with 744 attendance, 178 FNAC and 30 sputum cytology examinations were done, along with the Medical camps conducted by various voluntary bodies. The N.B.R.R. joined the Preventive and Social Medicine Department of the Alappuzha Medical College to conduct population screening of women under the area covered by the community health centre, Ambalappuzha which came under the rural health unit of Medical College Hospital Alappuzha. After the first screening high risk persons were identified and invited for second, third and fourth follow-up testing. These were done in the area at 6 monthly intervals. A total of 533 women were screened of whom, 46 women appeared for subsequent follow-up clinic. Detailed analysis is ongoing.

Cancer Awareness Programmes.

Under special request from the social organisations the following cancer awareness talks were organised followed by screening camps.

- | | | |
|----|---|-------------|
| 1. | Arts and Sports Club, Puthukkad | 14-08-1999. |
| 2. | Y's mens Club, Mynagappally | 15-08-1999. |
| 3. | Medical College health Centre, Ambalappuzha | 08-12-1999 |
| 4. | Town Club (Arts & Sports), Alumpeedika | 24-06-2000. |



Dr. R. Chidambaram, Chairman Atomic Energy Commission, and Secretary, DAE inaugurated the Micro Selector in RCC on 23.4.1999.



Dr. Kishorekumar, Director, and Scientists from BARC visited the Nuclear Biomedical Radiation Register, Kuvempunipally.

Distinguished Visitors.

- > During the year, Dr. Anil Kakkodkar, Director, BARC visited the NBRR along with Dr. (Ms.) A.M. Samuel, Dr. Sheshadri, Dr. Chaube, Dr. Sainis and Dr. Chauhan, Scientists from BARC.
- > Dr. Suminori Akiba, Kagoshima University, Japan, visited NBRR and held discussion on the ongoing studies.
- > In connection with the work of NBRR, Dr. Raghu Ram K. Nair visited the laboratory of Dr. Akiba and Dr. Morishima in Japan.

Ph.D. Thesis. Jayalekshmi. P.

Disability Characteristics in Cancer - Thesis submitted to the University of Kerala under the Co-guidance of Dr. M. Krishnan Nair, Regional Cancer Centre, Trivandrum.

Conferences, etc. attended – (Chapter III)

Papers presented – (Chapter IV)

Papers published – (Chapter V)

DIVISION OF RESEARCH

Dr. Prabha Balam	-	Additional Professor
Dr. Ravindran Ankathil	-	Associate Professor
Dr. S. Kannan	-	Assistant Professor
Dr. P. Remani	-	Assistant Professor
Dr. Molykutty John	-	Assistant Professor
Dr. Thomas Abraham	-	Scientific Officer

Cancer research continues with the overriding mission to place biological and clinical research at the service of improving the control of cancer. Various research programmes are undertaken with following objectives (1) the understanding of the cancer phenotype and how it can be developed and evolves as the immediate basis for the diagnosis and treatment of cancer and (2) the elucidation of the fundamental molecular-biochemical-biological modulations that underlie the development of the cancer phenotype and its continual evolution in increasingly malignant behaviour. The faculty who participate in these research programs complete for major grants which are important to sustaining the overall research effort. Current research work being carried out with grants from various agencies is briefed below:

Research Projects

1. Evaluation of metastatic potential in gestational trophoblastic disease using adhesion proteins and antimetastatic genes as indicators (1998-2001)

(Funded by the Indian Council of Medical Research, New Delhi)

Principal Investigator Dr. Prabha Balam

Co-Investigators Dr. C. Chandrika Devi

The aim of the above proposal is to evaluate the expression of different adhesion molecules CD44, CD44V6, E-Cadherin, P-Cadherin, ICAM, VCAM etc., and the antimetastatic gene nm23 in GTD and to correlate the expression pattern of the different adhesion molecules and nm23 with the different types of GTD (spontaneously regressing and slow regressing) and to analyze the potential of these parameters to identify the high risk patients harbouring tumour with invasive potential. The results obtained so far point towards a statistically significant downregulation of expression of E-cadherin in the molar placenta, more evident in the persisting and invasive

cell types, a downregulation of p-cadherin with no significant association with the invasive nature or the persistence of the tumour, and overexpression of nm23 in molar placenta with a significant downregulation in the invasive tumours and no role for CD44 or CD44V6 protein in the invasive or persistent nature of molar placenta.

The negative or aberrant expression of E-cadherin, and in the persistent trophoblastic disease group and those with histopathological signs of invasion point out that persistence of the disease is probably due to invasion of these trophoblasts into sites other than the uterus and systemic chemotherapy following debulking of uterine mass might be useful in these cases. The study is continuing and analysis with more samples would give a better idea of the role of these proteins and their potential use as markers in assessing the invasive nature of the tumour and its relation to the persistence of disease.

Role of viral genes, oncogenes and tumour suppressor genes in relation to aggressiveness in gestational trophoblastic diseases (1996-1999)

(Funded by the Council of Scientific and Industrial Research, New Delhi)

Principal Investigator Dr. Prabha Balam

Co-Investigators Dr. T.N. Rajalekshmi, Dr. Molykutty John

The results of the above study suggest an involvement of human papilloma virus and respiratory syncytial virus in the etiology of GTD. The results also suggest that the cell cycle regulatory genes are protected from the adverse effects of viral infection through some mechanisms which might be impaired in GTD. The ras oncogene pathway through activation of the c-erbB2 oncogene appears to be active in GTD. The Respiratory syncytial virus appears to induce stimulation of the c-erbB2 and ras pathway. Another interesting result noticed is the involvement of p53 in conferring the invasive capacity to the trophoblasts as shown by its close parallelism with the expression of the anti-metastatic proteins. A deletion of the p53 gene is also suggested, especially in the invasive moles. An observation made in the histology sections was that in spite of the high degree of atypia shown by the trophoblasts in GTD, apoptotic bodies were not noticed. The proliferations rate seems to be high as noticed by the staining by the proliferation markers PCNA and Ki-67. This gives rise to a feeling that the apoptosis could be defective in GTD which could lead to an accumulation of cells in the S phase. Increased proliferation is reported

to bring about an increased rate of apoptosis. This doesn't seem to be happening in GTD. Bcl2 gene expression which is inversely related to apoptosis is not altered in GTD in spite of the proliferation rate being increased in GTD. This aspect needs more intense work up. Overall, the studies show that some of the genes are altered in GTD, a viral association is possible with etiology of GTD which might bring about oncogenic changes in the genes of the ras oncogene pathway, a defect or deletion in the p53 gene and a defect in the apoptotic compartment are suggested. The results are being subjected to further analysis to identify the genes most altered in GTD and the interrelationships with other gene expression.

3. Genomic instability in relation to progression in oral cancers and precancers (1996-1999)

(Funded by the Board of Research in Nuclear Sciences, Dept. of Atomic Energy, GOI)

Principal Investigator Dr. Prabha Balaram

Co-Investigators Dr. Ramdas, Dr. Nalinakumary KR,
Dr. Anita Balan

The molecular alterations in the tumor suppressor genes, oncogenes, cell proliferating genes, cell-cycle control genes and anti-apoptotic genes were studied in oral cancers and pre cancers.

p53 is seen to be altered in the early stages of malignancy. In the severely dysplastic conditions of oral precancerous lesions, the alteration of this gene has been found to be high. This could be the combined effect of overexpression of wild type p53 to combat the DNA damage and also overexpression due to mutations leading to increased stability of the protein. The mild downregulation or the static expression of p53 in the cancerous state could be due to persistence of the mutated unrepairable state of the p53 gene leading to malignant transformation. P21 was also seen to be altered in both pre cancerous and cancerous lesions of the oral cavity and they show no specific correlation with p53 proteins suggesting that p53 independent mechanism.

Rb expression was increased in the precancerous lesions especially in the dysplastic lesions and both the tumor suppressor genes showed interdependence in precancerous conditions. The increase in RB protein probably is to suppress the oncogenic signal and this explains the coexisting expression of p53 and Rb in the precancerous lesions. The significant downregulation of the Rb protein

in the cancerous conditions and negative relation with p53 suggest that Rb gene expression is suppressed by possible viral protein interactions or by the mutant p53 action itself.

Ras, c-myc and cyclin genes were found to be altered in the precancerous and cancerous conditions of the oral cavity. Cell cycle proliferating genes Ki67 and PCNA are overexpressed in both the malignant and premalignant lesions suggesting that the cell cycle control - checkpoint rules are not obeyed in the malignant conditions.

The well known HPV viral aetiology has been noted in our studies also. The Immunohistochemical findings were confirmed by PCR techniques.

Antimetastatic Protein nm23 and adhesion molecules CD44 in breast cancers (1998-2000)

(Funded by Department of Science, Technology & Environment, Govt. of Kerala)

Principal Investigator Dr. Prabha Balaram

Co-investigators Dr. Iqbal Ahamed,
Dr. Elizabeth Abraham

Metastasis is the principal cause of treatment failure in breast cancers and this study is aimed at identifying lesions with potential for metastasis by evaluating the expression of antimetastatic gene nm23 and adhesion proteins CD44, its variant CD44v6. The observations of this study suggest that overexpression of nm23H1 gene can be used as good marker of distant metastasis and apoptosis but not of local metastasis while p53 gene expression holds good promise as a marker of nodal involvement. nm23H1 also appears to be a regulator of c-erbB2 function which in turn is reported to be closely associated with prognosis in breast cancers.

CD44 and CD44v6 were downregulated in the premalignant and malignant lesions of the breast, more so in the malignant lesions. CD44v6 protein showed marginal downregulation in 40% node positive tumours and most of these tumours had more than one node involved suggesting its potential as a marker of metastasis in tumours where more than one node is involved.

Cadherins were localised to the membranes with high intensity in the normal and at a lesser intensity in the premalignant lesions and malignant lesions. A major shift in the protein from the membrane to the cytoplasm was noticed in a few (20%) of the malignant tumours.

Incidentally, most of these tumours had distant metastases. Downregulation of the cadherins, both e-cadherin and p-cadherin was a prominent feature in metastatic breast tumours and suggested that the cadherins could be potential markers of nodal metastasis.

5. Establishment of Familial Cancer Registry (1995 - continuing)

Investigators Dr. Ravindran Ankathil
 Dr. Aleyamma Mathew
 Dr. M. Krishnan Nair

Almost all the cancers occur either in common sporadic form or less commonly in familial form. Familial cancers comprise a significant fraction of overall cancer burden. The family history analysis is an easily acceptable and very productive method for identification of familial cancer clusters. We have started taking details of family history of cancer among all the cancer patients registered in our centre and have identified several cancer families. Among these families, the most frequently occurring cancers are Oral (29%), Breast (22.5%), Colorectal (16.1%), Uterine cervix (10.7%), Lung (6.5%), Thyroid (4.3%) Ovary, Stomach, Prostate etc.

The study is being continued with the following objectives:

(1) to investigate the incidence of familial cancers at the Regional Cancer Centre, through pedigree analysis. (2) to compile the pedigrees and estimate the relative cancer risk of the family members and (3) to establish a registry for the familial cancers.

6. Evaluation of Haematologic and cytogenetic response of Interferon treatment in CML patients (1998 - continuing)

(Funded by Fulford India (Pvt.) Ltd.)

Investigators Dr. Ravindran Ankathil,
 Dr. V.P. Gangadharan
 Dr. N. Geetha

Chronic Myeloid Leukaemia is characterized cytogenetically by the reciprocal translocation t(9;22) (q34;q11). This results in derivative chromosome 22, the Philadelphia (Ph⁺) chromosome, which is present in 90 to 95% of CML patients. Ph⁺ chromosome serves as a marker for the malignant clone and allow the cytogenetic diagnosis and follow up of the disease. Recently, Interferon alpha therapy has been useful in suppressing a relapse of Ph⁺ positive cells. Interferons have the potential to control progression in the chronic phase and with the definitive suppression of cytogenetic clonal evolution, provide effective treatment of more advanced stages of the disease. This study

aims to evaluate the haematologic and cytogenetic response of Interferon alpha treated CML patients, is being continued.

Genetic susceptibility studies in Breast/ovarian cancer families (1997-2000)

(Funded by Dept. of Science & Technology, Govt. of India)

Investigators Dr. Ravindran Ankathil,
 Dr. Jayaprakash Madhavan
 Dr. Thomas Abraham,
 Dr. V.P. Gangadharan

At the Regional Cancer Centre, Trivandrum, several families have been identified in which cancer of the breast and/or ovary aggregate among first degree relatives. This study aims to develop a sensitive and practical genetic assay by which genetically susceptible high risk members in breast and ovarian cancer families might be specifically identified and distinguished from their low risk relatives. The affected and unaffected family members in these cancer families are being analyzed at the molecular and cytogenetic levels, for genetic susceptibility markers. At the cytogenetic level, constitutional chromosome abnormalities, chromosomal fragile sites and mutagen induced chromosome sensitivity were investigated employing peripheral blood lymphocyte microcultures. Comparative analysis of aphidicolin induced chromosomal fragile site frequencies in affected and unaffected subjects from multiple families with breast/ovarian cancer, did not show any significant increase in the expression frequency of any particular type of fragile sites. There was quite a large variability between individuals within each group. A number of fragile sites were expressed only in patients (2p24, 3q27, 5q11, 7p22, 11p15, 11q14) or only in controls (1q25, 2p13, 3q21, 13q13). However, the expression of each of these sites was only observed in few individuals in each group. These results indicate that the incidence of aphidicolin induced fragile site expression in breast cancer patients including both sporadic and familial cases, does not differ significantly from unaffected individuals and controls. Mutation analysis of the breast cancer susceptibility gene BRCA1 in familial breast cancer patients is in progress.

8. Cytogenetic evaluation of genomic instability in Down Syndrome patients with and without malignancies (1999-2001)

(Funded by Kerala State Dept. of Science & Technology)

Investigators Dr. Ravindran Ankathil,
 Dr. P. Kusumakumary

Down Syndrome (DS) which is characterized by trisomy and other abnormalities involving chromosome 21, is the most common postnatally viable human genetic abnormality in the general population. Down syndrome is characterized by a predisposition to leukaemia and other malignancies. But the mechanism(s) for carcinogenesis in Down Syndrome patients is unknown. Information is lacking concerning possible genetic factors which predispose the DS patients to the development of malignancy. In the absence of complete information on the genes involved, it is of interest to study the genomic instability of DS patients. Patients with genomic instability show an increased sensitivity to mutagenic or clastogenic agents. Mutagen sensitivity is considered as a constitutional factor that is directly related to cancer risk. Enumerating mutagen induced chromosomal lesions which may reflect defective DNA repair system, might be a biological marker of an individual's cancer susceptibility risk. This study aims to determine the genomic instability of DS patients with and without malignancy and to explore whether mutagen induced chromosomal sensitivity of DS patients could give any clues to their cancer predisposition.

9. Biological Prognostic Markers in Oral Carcinoma (1997-2000)

(Funded by Indian Council of Medical Research)

Investigators Dr. S. Kannan, Dr. V.N. Bhattathiri
 Dr. Elizabeth K. Abraham
 Dr. K.R. Nalinakumari

The treatment response and survival in oral cancer patients vary widely from one patient to another. The present clinical as well as pathological features of the lesions possess only limited ability to predict treatment response. In order to assess the biological behaviour of the tumour and for individualized management, the present study is being analysing the expression pattern of a set of proteins involved in the crucial steps of cell cycle progression in oral carcinoma. The cell cycle regulators such as p53, CDK-4, CDK-6, Cyclin-D1, p21, p107 and Ki-67 is being immunohistochemically analyzed in the pre-treatment biopsies. In addition to this, an angiogenic factor VEGF and anti-apoptotic protein bcl-2 and percentage of apoptotic cells (TUNEL method) are also being analyzed in these tissues. The experimental part of the project has been completed. At present statistical analysis of the final data is being done to know the prognostic significance of the markers studied.

Cell membrane studies in relation to tumour progression, invasion and metastasis in Oral and Breast cancers using lectins (1996-1999).

(Funded by Dept. of Science, Technology and Environment, Govt. of Kerala.)

Principal Investigator Dr. P. Remani
 Co-Investigator Dr. Elizabeth K. Abraham

Differences in cell surface carbohydrate expressions are detected using lectins and such differences have been shown to be of diagnostic and prognostic significance. The cell membrane is known to play a role in the metastatic process. The aim of the present study is to evaluate the relationship of lectin (Jack fruit and Peanut lectin) binding frequency of oral and breast cancer cells to their capacity to metastasise to the lymph node. Scrape smears and wax embedded tissue sections from 102 cases of oral cancer and 86 cases of Breast cancer cases were used for the study. The frequency of lectin binding varied among the tumours studied. The frequency of lectin binding was ranged from 50% to 100%. In oral cancers 67 patients showed percentage positivity >85% whereas in 35 patients <85% of tumour cells showed lectin staining. In breast cancers 97 patients showed >85% positivity whereas 39 patients showed <85% of tumour cells showed lectin staining. The results showed that tumours with a high frequency of lectin binding cells had higher risk of lymph node metastasis.

Cell surface changes in leukaemic cells - a study using plant lectins (1999-2002).

(Funded by Dept. of Science, Technology and Environment, Govt. of Kerala.)

Principal Investigator Dr. P. Remani
 Co-investigator Dr. Rekha A. Nair

In this study our aim is to isolate and purify new tissue specific lectins from the indigenous plants of Kerala and to evaluate whether these lectins can be used (1) To assess the agglutinability of plant lectins to leukaemic cells (2) To evaluate the responsiveness of leukaemic lymphocytes to stimulation by plant mitogen. (3) To study the binding properties of lectins to different types of leukaemic cells and to see whether these lectins can be used for the typing of leukemias. The results showed that Jack fruit lectin (JFL) and Artocarpus hirsuta agglutinin (AHA) have the property of agglutinating

leukaemic cells. Leukaemic cells taken after 24 hour culture with DAPI and AHA revealed marked increase in the extent of blastogenic transformation compared to normal lymphocytes. Lectin staining studies showed that in normal haematopoietic cells neutrophilic series from the myelocyte stage onwards exhibited intense and consistent positivity. Eosinophils stained weakly with their precursors showing higher intensity of staining. In Acute lymphocytic leukaemia (ALL) and Chronic lymphocytic leukaemia (CLL) JFL exhibited negative staining to all the lymphoblasts. In Acute myeloid leukaemia (AML) different subtypes showed varying degrees of positivity.

12. Expression of epidermal growth factor and transforming growth factor alpha in relation to aggressiveness in GTD (1999-2001)

(Funded by Indian Council of Medical Research)

Investigators Dr. Molykutty John, Dr. Prabha Baiaram, Dr. Chandrika Devi CG

GTD, reported to be a hyperproliferative condition of the placenta was analysed for the expression and concentration of epidermal growth factor and transforming growth factor alpha and their receptor EGFR. The growth factors and receptor were highly overexpressed in the GTD lesions and the concentrations of these were more than 100 fold increased in GTD. The expression of TGF alpha and EGFR showed very close correlation in the first trimester in normal placenta and all gestational stages in the molar placenta suggesting the existence of an autocrine mechanism wherein TGF alpha acts through EGFR. There is also a concomitant increase in the EGF in molar placenta (not seen in normal placenta) suggesting that both the EGF-EGFR and TGF alpha-EGFR pathways are active in molar placenta.

13. Evaluation and classification of Radiation induced acute immediate Nuclear and cytoplasmic changes in oral epidermoid carcinoma cells (1997-1999)

(Funded by Dept. of Science, Technology and Environment, Govt. of Kerala.)

Principal Investigator Ms. Bindu L
Co-Investigators Dr. Bhattathiri V.N.

Oral cancers are the commonest cancers in India and radiotherapy is the mainstay of treatment. Many clinical, patient and intrinsic factors influence the treatment policy decision and outcome in the radiotherapy of oral cancers. At present there are not many

methods to identify the radiosensitivity of tumors. If such a test is available the treatment modalities can be altered either by adding surgery or chemotherapy. 84 patients with squamous cell carcinoma of oral cavity treated by radical radiotherapy (52.5 Gy/16 frs/5 wks) with or without concurrent chemotherapy were included in this study. Smears taken before and during treatment, stained with papanicolaou stain, were assessed for eighteen parameters such as nuclear and cellular morphology, chromatin pattern, cytolysis and karyolysis, karyorrhexis, nuclear pyknosis, micronucleation, multinucleation, perinuclear halo, nuclear bud, nuclear and cytoplasmic vacuolation, cytoplasmic vacuolation, glycogen bodies etc. From each smear, 100 cells were evaluated for various radiation induced changes. Patients were regularly followed for a minimum of 15 months. For the purpose of analysis patients were classified into radio resistant and radio sensitive groups. Out of 18 parameters studied certain parameters like nuclear and cytoplasmic vacuolation, leucocytic superimposition, perinuclear halo showed increase in relation to dose but the difference was not statistically significant. Six parameters such as nuclear pyknosis, karyorrhexis, karyolysis, micronucleation, multinucleation, cytolysis showed significant correlation with increase dose of radiation. This suggests that they have potential for use as predictive indicators of radiosensitivity.

Academic credits

Dr. Prabha Baiaram Thesis evaluated

Examinership

Ph.D and Ph.D Examination

- Calicut University 1
- Anna University 1

M. Sc Biotechnology (Cell and Cell Biology)

- Calicut University I & II Semesters

Referees for projects and publications

	Nos
	1999-2000
Indian Council of Medical Research, Govt. of India	2
Council of Scientific and Industrial Research, Govt. of India	5
Department of Science and Technology, Govt. of India	6
Indian Journal of Experimental Biology	2
Australasian Journal of cancer	3

Positions Held

Executive Committee member

Indian society for Radiation Biology

Member

Expert team - Setting up of Early Cancer Detection Centre, Pathanamthitta, Kerala.

Expert Panel - Formulation of a National Programme on Oral Cancer (DBT, GOI)

Team visiting to evaluate the clinical set up, Amritha Institute of Medical Sciences, Ernakulam

Governing Body Amala Cancer Centre, Trichur.

Expert

Flexible Complementing Promotion committee - SCTIMST, Trivandrum.

Invited Lectures

Lecture on "Cancer and Environment" Mahatma Gandhi University, Priyadarshini Hills, Athirampuzha, Kottayam, 27-5-1999.

Lecture on "T cell transduction" Faculty improvement programme for postgraduate teachers of Kerala University, Women's College, Trivandrum, Kerala on 17-3-2000. (Invited faculty resource person)

Lecture on "Immunology in medicine" Faculty improvement programme for postgraduate teachers of Kerala University, Academic Staff College, Trivandrum, Kerala on 22-3-2000. (Invited faculty resource person)

Dr. Ravindran Ankathil

Examinership

Ph.D Calicut University - Calicut University

Referee for projects and publications

	Nos
	1999-2000
British Journal of Cancer	1
Austral Asian Journal of Cancer	1
Dept. of Science and Technology, Govt. of India	2

Clinical cytogenetics - Lecture and practical demonstration to MBS students of Trivandrum Medical College. May 29th to 2nd June 1999.

Invited Faculty (Resource person) for Refresher course for Govt. College teachers in Zoology, at Trivandrum on 8-3-2000.

Awards/Honours/Training

Dr. Prabha Balaram

Featured in the Who's Who in the World, 17th Edition, 1999.

Nominated as Outstanding Woman Scientist of the Year 1999.

Dr. Indran Ankathil

UICC Yamagiwa Yoshida International Cancer Study Grants award. Fellowship of 3 months duration from 1-9-1999 to 30-11-1999 at the Dept. of Medical Genetics, St. Mary's Hospital, University of Manchester, Manchester, U.K.

Selected to be featured in the Who's Who in the World, 18th Edition, 2000.

Ms. Chandini R.

Ms. R. Chandini was awarded Ph.D by the University of Kerala in June 1999.

Remani P

Attended UICC training course on "Novel Approaches in Cancer Therapy and Diagnostics", Jena, Germany, September 19-24, 1999.

Research Supervision

Dr. Prabha Balaram

1. Genomic instability in breast cancer	Ongoing doctoral programme Ms. Priya Srinivas
2. Molecular biology of Gestational Trophoblastic disease	Ongoing doctoral Programme Ms. Swapna Enose
3. Molecular alterations in oral cancer with special emphasis on oncogenes and tumour suppressor genes	Ongoing doctoral programme Ms. Prishla Varghese
4. Adhesion protein as metastatic markers	Ongoing doctoral programme Ms. Maya Madhavan

MD/MS Thesis

1. p53 alterations in relation to habits in oral cancer
Ongoing Programme
Dr. Sanila (Dental College, TVM)
2. Validation of serum beta HCG 4 weeks post evacuation and cytological atypia as markers of persisting disease in Complete Hydatidiform moles.
Ongoing Programme
Dr. Uma (MD OBGY)
SAT Hospital, Trivandrum
3. Molecular alterations and association with Epstein Bar Virus in Nasopharyngeal Carcinoma
Ongoing Programme
Dr. Susan James,
(ENT, MCH, TVM)
4. Molecular alterations in p21 and p53 in precancers and cancers of the oral cavity
Ongoing Programme
Dr. Cynthia A Robinson
Meenakshy Dental College,
Madras.

Dr. Ravindran Ankathil

1. Genetic susceptibility studies In Breast/Ovarian cancer families
Ongoing doctoral Programme
Mr.B. Vinod Kumar
2. Cytogenetic and Haematologic response studies of biotherapy in patients with Haematological malignancies
Ongoing doctoral Programme
Mr.S. Hariharan
3. Cytogenetic studies in Myelodysplastic syndromes.
Ongoing doctoral Programme
Ms.Roshni Thomas
5. Genetic studies in Down syndrome patients with and without malignancies
Ongoing doctoral Programme
Ms.Sheeja V.R
6. Cytogenetic and Molecular cytogenetic studies In Acute Nonlymphocytic Leukaemias.
Ongoing doctoral Programme
Mr.Sunil K.S

MDS Thesis

1. Genetic predisposing factors in Familial Oral Cancer
Ongoing Programme
Dr. Pramod Varghese
Dental College, Trivandrum

Dr. Remani P

1. Plant lectins and their applications in oncology
Ongoing doctoral programme
Ms. Smitha LS
2. *Artocarpus integrifolia* lectin as a biological marker in hematological neoplasms.
Ongoing doctoral programme
Ms. Lajja S Nair
3. Isolation and purification of some plant lectins and its application in cytopathology
Ongoing doctoral programme
Mr.Sujathan K.
4. Anti-cancer studies in selected medicinal plants used in traditional and folklore medicine of Kerala with particular reference to the Western Ghats.
Ongoing doctoral programme
Ms. Geetha B.S
5. Multiparametric evaluation of radiation induced changes in the erythrocytes of cancer patients.
Ongoing doctoral programme
Ms. Geetha C.S

Dr. S. Kannan

1. Studies on cell cycle regulatory proteins in oral carcinoma
Ongoing doctoral programme
Mr.R. Jayasurya

Courses conducted

1. Annual Immunology training (Two months) for M.D.Microbiology students, Medical College, Trivandrum
2. Training on Human Cytogenetic Techniques - B.Sc. MLT students - M.G.University

Cytogenetic Investigations undertaken

1. Peripheral Blood Lymphocyte Karyotyping : 330
2. Bone marrow karyotyping : 197
3. Foetal Blood karyotyping : 9

Conferences, etc. attended - (Chapter III)

Papers presented - (Chapter IV)

Papers published - (Chapter V)

DIVISION OF LABORATORY MEDICINE AND TUMOR BIOLOGY

Dr. M. Radhakrishna Pillai - Assoc. Professor

The Division of Laboratory Medicine & Tumor Biology entered the new millennium completing its sixth year. With a record number of 22 extramurally funded research grants obtained to date, the department continues to direct basic and translational research. We have placed great importance on encouraging and fostering the development of active, diverse and progressive research programs that incorporate clinical, basic and population-based elements. This year also saw the department beginning two new areas of investigation: genetic susceptibility to environmental carcinogenesis and anti-cancer drug development programme.

The study of medicinal plants in oncology is an area of immense importance owing to the need for better, more effective and less toxic anti-cancer compounds. The use of natural compounds that effectively induce apoptosis of tumor cells are ideal for anti-cancer drug development programs. One such plant identified to have cytotoxic properties is *Solanum trilobatum*. In a pilot study, a partially purified extract, Sobatum was analyzed for anti-tumor properties. Activity of the compound was analyzed on fresh tumor cells obtained from pediatric acute lymphoblastic leukemia patients as well as cultured HeLa cells. The cells were cultured with different concentrations of the drug and apoptosis detected using the TUNEL assay. Expression of p53, bcl-2 and bax proteins were studied using immunocytochemistry. The study revealed that while at high concentrations, necrosis was observed, as the concentrations decreased, the mode of action was mainly through the apoptotic pathway. Further purification and characterization of the active principle will be required for better understanding of the mode of action of the compound. We also analysed for anti-tumour activity of Curcumin isolated from turmeric plant (*Curcuma longa*). The sensitivity of different tumors to curcumin varied from five micromolar to fifty micromolar concentrations. We observed drastic morphologic changes with increase in dosage of curcumin treatment. An apoptotic phenotype was predominantly seen at lower concentrations, between five and twenty micromolar concentrations. During these changes we found differential gene expression of various genes, including p53, bcl-2, ras and waf-1.

of proliferative and apoptotic state of curcumin treated cells. Elucidation of these pathways are needed to correctly understand the anti-tumor properties of curcumin.

The breast cancer research program completed its first phase, the elucidation of the role of programmed cell death and treatment. In continuation with previous studies, we analyzed the prognostic significance of functional markers that play a causative role in breast tumor development and may influence five-year disease free survival period. Our analysis revealed that p53, bcl-2, nodal status, histological grade, proliferative Index as measured by Ki 67 immunoreactivity, estrogen and progesterone receptors, provide independent prognostic information with regard to five year disease free survival in patients with breast carcinoma. High apoptotic index was also correlated with poor clinical outcome, in terms of disease free survival. However, we failed to confirm its independent prognostic significance when adjusted for other established or proposed prognostic variables in the multivariate analysis. This means that in untreated human breast cancer, the cell proliferation rate is the major determinant of the prognosis, independent of apoptosis. Both univariate and multivariate analysis showed that low bcl-2 expression was a statistically significant indicator of relapse free survival within 5 years of surgery. In particular, relapse free survival curves showed a better prognosis for patients whose tumor had intense expression of bcl-2. An important finding with respect to the association of high expression of bcl-2 with improved survival, was the strong correlations observed between bcl-2 expression and a number of important clinicopathological parameters. High expression of bcl-2 was associated with well-differentiated tumors and with estrogen receptor positivity. Thus, overexpression of bcl-2 was associated with the presence of a number of classical prognostic factors known to predict a lower risk of relapse, providing a likely explanation for the improved disease free survival for patients with tumors expressing high levels of bcl-2. Our results using multivariate analysis show that mutations in p53 are important prognostic markers for breast cancer. We conclude that patients with a p53 mutation in their tumors are at higher risk of recurrence than patients without p53 abnormalities. Alterations in the p53 gene were usually associated with high proliferating rate as measured by Ki 67 immunoreactivity in the present study. Since Ki 67 levels were associated with other prognostic markers such as tumor size, nodal status, and estrogen and progesterone receptor status, it was also necessary to analyze whether the effect of the proliferative index was

independent of the effects exerted by the other variables. The results from the present study confirmed that Ki 67 immunoreactivity is considered as an independent prognostic variable, even when adjusted for nodal status. The level of Ki 67 thus proved to be a good prognostic marker in predicting 5 year disease free survival. It is therefore, obvious from these points that biological markers can play a vital role in the management of patients with breast cancer.

Our human papillomavirus (HPV) and epithelial cancer research program continued as in the previous years to produce exciting results. Cellular immortality appears to be a hallmark of malignancy. Telomerase is an enzyme associated with cellular immortality and this has raised considerable interest from a diagnostic and prognostic viewpoint. We could show a differential expression of telomerase in various phases of cervical tumor progression. While the enzyme was rarely detected in normal cervical epithelium and low grade squamous intraepithelial lesions (SILs), it was expressed in over 61% of high grade SILs and 85% of invasive cervical cancers. Also evident was a definite correlation between telomerase expression and presence of high risk HPV infection. HPV infection is a well documented risk factor for cervical cancer and we have previously explained the significance of active high risk HPV infection characterized by the expression of the E6 transforming protein. In the present study, concurrent accumulation of p53 and E6 expression was significant in high grade SILs and invasive cancer. E6 can interfere with the normal function of p53 by its ability to abrogate both transcriptional activation and transcriptional repression function of the gene and is known to degrade p53 via ubiquitination. Analysis of telomere lengths obtained from normal cervix tissues showed repeat lengths to be in the range 0.5 kb to >23 kb. However a higher concentration of repeats were in the lower molecular weight range (0.5 to 15 kb range). A similar result was obtained for low grade SILs except for the fact that fragments greater than 23 kb were conspicuously absent. High grade SILs and invasive cancers showed telomere repeats ranging from 0.2 kb to >23 kb. Most of the fragments were in the higher molecular weight range (10 to >23 kb). The lower molecular weight fragments were presumably present owing to the high proliferative fraction of these tumors. The fact that most of the tumors had telomere repeats in high molecular weights could be due to the reactivation of telomerase. The mortality stage 1 (M1) is a critical point of the two stage mechanism that governs both cellular senescence and immortality. M1 senescence is thought to be regulated by the p53 gene. Inactivation of the latter by

the E6 protein can lead to non recognition of telomere erosion and uncontrolled growth of such cells followed by telomerase activation past a critical point and then on to immortality. Cells with reduced telomere lengths and inactivated p53 are more susceptible to chromosome breakage-fusion-bridge cycles. If telomerase is active, this could lead to the production of stable aberrant chromosomes raising the possibility of further oncogene activation or anti-oncogene inactivation, a condition which can be called a "telomere crisis". Under such conditions where these criteria are met, the rates of progression of cervical pre-malignant cells onto invasive cancer may be greatly accelerated.

The apoptosis research program continued with studies on the relevance of the phenomenon in various tumors. We analyzed in thyroid tissue, the significance of apoptosis in relation to the expression of p53 and bcl-2 proteins, tissue proliferation defined by Ki-67 expression, and tissue histology. There was good correlation between Ki-67 reactive cells and morphological evaluation criteria for apoptosis. The extent of apoptosis was significantly associated with the type of thyroid lesion, both proliferative (namely multi nodular goitre) and neoplastic (benign and malignant). Higher extent of apoptosis was evident in medullary and anaplastic carcinomas. Apoptosis also correlated to p53 protein accumulation and Ki-67 immunoreactivity. An inverse correlation was observed between bcl-2 expression and the extent of apoptosis. A direct correlation was also observed between p53 expression and Ki-67 immunoreactivity. Bcl-2, by inhibiting apoptosis may cause a shift in tissue kinetics towards the preservation of genetically aberrant cells thereby facilitating tumor progression. These results imply that rapidly proliferating tumors appear to have a high "cell turn over state" in which there may be increased chance of apoptosis amongst the proliferating cells. The ability of apoptosis to occur in the presence of a possibly mutant p53 protein suggest the existence of at least two p53 dependent apoptotic pathways, one requiring activation of specific target genes and the other independent of it.

The prognosis for children with acute lymphoblastic leukemia (ALL) has improved over the past few years with the use of combination chemotherapy. However, even with these modern treatment protocols, about one third of the patients still relapse. Identification of clinical and biological factors that accurately predict response to therapy has thus been a continuing goal. We have previously explained the role of apoptosis and its regulatory genes in relation with treatment outcome in pediatric ALL. We have now tried to determine the relation between

in vitro sensitivity to each of 10 single drugs and other cellular parameters such as chromosome 17-copy number, p53 expression and spontaneous apoptosis. Chromosome 17 copy number was detected by interphase cytogenetics using non radioactive in situ hybridization (NISH) with a centromere specific DIG labelled DNA probe. In vitro drug sensitivity was assessed using the colorimetric Methyl Thiazol Tetrazolium (MTT) assay. Apoptosis was determined by In Situ End Labelling using biotin-dUTP. All laboratory parameters were correlated with clinical features. Our results show that combination of p53 immunocytochemistry, chromosome 17 interphase cytogenetics, in vitro drug sensitivity and apoptosis provides much better insight into the mechanisms of cellular drug resistance. Such determinants of chemotherapy response may provide significant information regarding risk stratification and the possible formulation of a prognostic index.

Our radiobiology program has produced results of considerable significance. Previous studies have suggested that ras gene mutation may influence cellular response to radiotherapy. However clinical studies have been limited by the cumbersome methodology associated with DNA analysis. The availability of ELISA method has made clinical evaluation of ras gene mutation feasible. We have therefore in this study analyzed for ras mutation by in vitro identification of four mutant forms of p21 ras in cervical tumor tissue extracts. Expression of ras p21 mutations were analyzed in 101 patients for a correlation between pre - treatment experimental analyses and the clinical status of the patient after radiotherapy (up to 16 months follow up). There was no correlation between the presence of Val 12 p21 and tumor response to radiotherapy. However presence of the other three mutant proteins had significant relationship to treatment outcome. Detection of Arg 12 mutation was more common in patients who either had residual disease or developed recurrences (75%) as compared to those remaining disease free. The presence of the Arg 12 mutation therefore significantly correlated to poor prognosis. Similarly the Asp 12 mutation was also more common in patients with residual/recurrent disease (71%) as compared to patients remaining disease free (29%). Asp 12 mutation therefore also showed a correlation to treatment outcome. On the contrary, the Asp 13 mutation was more frequent in patients who remained disease free (69%) as compared to those with residual/recurrent disease (39%). All patients in the study were also genotyped for the mutations using PCR with specific primers. The majority of patients remaining disease free (81.5%) showed no evidence of ras

gene mutation. In patients with recurrent or residual disease the majority showed evidence of ras mutation with the maximum number positive for N ras 12 (58.3%) followed by K ras 13 (16.6%) and H ras 12 (11.1%). We had previously demonstrated in the same patient group, the role of apoptosis, cell proliferation, bcl-2 and p53 in relation to radiotherapy response. Higher levels of apoptosis and cell proliferation were associated with good tumor response to radiotherapy (Group 1 patients) while bcl-2 over expression was indicative of a poor prognosis (Group 2 patients). The present results on ras gene mutations seem to corroborate and strengthen these results. There was a significant negative correlation between the total proliferative compartment (Ki 67 immunoreactivity) and the in vitro S phase fraction as reflected by bromodeoxy uridine labelling. A similar negative correlation was evident between the extent of apoptosis (TUNEL reactive cells) and the presence of gene mutations. Presence of the ras mutation also correlated with bcl-2 over expression. There was no correlation between p53 mutation or accumulation with the presence of ras gene mutation. It is therefore clear that there is enough laboratory evidence to implicate ras genes as modulators of tumor response to radiation therapy. This understanding of the involvement of specific genes in radioresistance will improve our resolve to design potential therapies that can be aimed at specific genes, through approaches such as selective inhibition by anti-sense oligonucleotides.

On going research projects (1999-2000)

1. **The mutant p53 protein in breast cancer.**
(Funding Agency Kerala State Committee for Science, Technology & Environment)
Investigator Dr. M. Radhakrishna Pillai
2. **Tumor response to radiation therapy in carcinoma of the uterine cervix - the role of ras gene mutation**
(Funding Agency Indian Council for Medical Research)
Investigators Dr M. Krishnan Nair, Dr M. Radhakrishna Pillai
3. **Radiosensitivity, treatment outcome and ras gene mutation in rectal carcinoma**
(Funding Agency Department of Atomic Energy, Govt. of India)
Investigators Dr Jayaprakash Madhavan, Dr M. Radhakrishna Pillai

4. **Molecular Regulation of Programmed Cell Death**
(Funding Agency Department of Science & Technology, Govt. of India)
Investigator Dr M. Radhakrishna Pillai
5. **Programmed tumor cell death and proliferative fraction ratio in the staging of thyroid cancer.**
(Funding Agency Indian Council for Medical Research)
Investigators Dr V.M. Pradeep,
Dr M. Radhakrishna Pillai
6. **Telomere dynamics, telomerase activation and epithelial tumor progression.**
(Funding Agency Council for Scientific and Industrial Research)
Investigator Dr M. Radhakrishna Pillai
7. **Cellular immortality and apoptosis during tumor progression in the uterine cervix.**
(Funding Agency Indian Council for Medical Research)
Investigator Dr M. Radhakrishna Pillai
8. **Significance of programmed cell death in pediatric acute lymphoblastic leukemia.**
(Funding Agency Dept of Science & Technology, Govt. of India)
Investigators Dr P Kusumakumary
Dr M. Radhakrishna Pillai.
9. **Programmed tumor cell death and proliferative fraction ratio in the staging of breast cancer.**
(Funding Agency Kerala State Committee for Science, Technology & Environment)
Investigator Dr M. Radhakrishna Pillai
10. **Cellular Immortality and de novo apoptosis in tumor tissue: significance for response to radiotherapy for cervical cancer.**
(Funding Agency Dept. of Atomic Energy, Govt. of India)
Investigator Dr M. Radhakrishna Pillai
11. **Open labeled, single group study into the affect of nordihydroguaierectic acid (NDGA) derivatives on oral and cervical pre-malignant lesions associated with human papillomavirus infections**
(Funding Agency Johns Hopkins University & National Institute of Health, USA)

- Investigators Dr M. Krishnan Nair, Dr. Manoj Pandey,
Dr M. Radhakrishna Pillai
12. **Susceptibility to childhood acute lymphoblastic leukemia: Influence of CYP1A1, CYP2D6, GSTM1 & GSTT1 genetic polymorphisms.**
(Funding Agency Council of Scientific and Industrial Research)
Investigators Dr. P. Kusumakumary
Dr M. Radhakrishna Pillai
 13. **Genotyping of the CYP1A1 and GSTM1 genes in tobacco associated oral cancer.**
(Funding Agency Indian Council for Medical Research)
Investigators Dr. K. Ramadas,
Dr M. Radhakrishna Pillai
 14. **The role of telomere fragment lengths and telomerase activation during tumor progression in the uterine cervix.**
(Funding Agency Kerala State Committee for Science, Technology & Environment)
Investigator Dr. M. Radhakrishna Pillai
 15. **Estrogen receptor gene polymorphism in Indian breast cancer and response to tamoxifen treatment.**
(Funding Agency Kerala State Committee for Science, Technology & Environment)
Investigators Dr. B. Rajan, Dr M. Radhakrishna Pillai
- Human Resource Development: Doctoral and Post-Doctoral Programme**
Two candidates completed their doctoral program and submitted theses to the University of Kerala.
- | | |
|--------------------|--|
| Ms Lakshmi Kesari | Programmed cell death in breast cancer. |
| Mr R Radhakrishnan | Cellular and molecular profile of Non Hodgkin's lymphoma |
- The Division has currently one post doctoral trainee and 6 PhD candidates working in the Doctoral Programme of the University of Kerala and supported by fellowships from the Council for Scientific and Industrial Research and University Grants Commission.
- Dr. T.T. Sreelekha Genetic epidemiology of oral cancer

- Mr. G. Srinivas** Programmed cell death, chemotherapy response and prognosis in pediatric acute lymphoblastic leukemia.
- Mr. Pradip Nair** Molecular manifestations of tumor progression in the uterine cervix.
- Ms. Priya Chacko** Genetic epidemiology of sporadic Indian breast cancer.
- Ms. Sreevidya. S** Human papillomavirus E6, E7 and p53 gene polymorphism in Indian cervical carcinoma.
- Mr. Thomas Joseph** Influence of genetic polymorphism on susceptibility to and treatment outcome of childhood acute lymphoblastic leukemia.
- Ms. Bindhu. O. S** Metalloproteinase and CD44 genes in oral mucosa.

The division is also a resource and training centre for post graduates of the Medical College Hospital, Thiruvananthapuram. During the year, 4 students, who did their theses here were awarded MD degrees from the University of Kerala

- Dr. Shobha Abraham** Dept. of Pathology, Medical College Hospital : Angiogenesis and Tumor Proliferation in meningioma.
- Dr. Preethi TR** Dept. of Pathology, Medical College Hospital : The role p53 gene expression in epithelial ovarian tumors.
- Dr. Vijayalakshmi K** Dept. of Pathology, Medical College Hospital : Apoptosis in thyroid neoplasms.
- Dr. Sajini Elizabeth Jacob** Dept. of Pathology, Medical College Hospital : The clinico - pathological relevance of human papillomavirus infection in lesions of the larynx.

Ongoing M.D thesis

Dr. Manju, Dept. Of Pathology, Medical College Hospital : Histologic grading and study of p53 expression in astrocytomas.

Conferences, etc. attended - (Chapter III)

Papers presented - (Chapter IV)

Papers published - (Chapter V)

DIVISION OF CLINICAL LABORATORY SERVICES

Smt. B. Padmavathy Amma - Chief Technical Officer

This division as in previous years renders excellent services not only to this Centre, but also to other institutions. Other laboratories also seek our help for Quality Assurance Programme. We are collaborating with BIO-RAD Laboratories, California, which is accepted by WHO, for external quality evaluation programme. This is perhaps the only laboratory in Kerala having such a privilege. In addition to this we are participating with Christian Medical College, Vellore also for quality control evaluation.

Twenty four hours laboratory service are being provided by this Division for the benefit of the patients, with the limited staff. On an average nearly 400 samples per day are examined. Blood samples are collected by using vacutainer. Reports are speeded up according to the condition of the patient.

The haematology section has the credit of utilising fully automatic Coulter Onyx, Coulter AcT8 and also coagulation analyser. The analyzer flagged samples are manually scanned by our technicians giving accurate results.

In the biochemical division we have semi-auto wet chemistry analysers of E-Merk and one Semi and fully automatic Dry Chemistry Analyser from Johnson and Johnson, which will help us for sending reports within a short time. In addition to this we have Blood Gas analyser. We are doing special tests like Electrophoresis and Immunoglobulin Assay.

Collaborating Research Projects

Name of the project	Investigating Officer/s
Atlas Trial	Dr. B Rajan
Droloxifen Trial	Dr. K Ratheesan & Dr. N Geetha
Gemcitabine Trial	Dr. V.P. Gangadharan & Dr. Ramdas
TLCD-99 Trial	Dr. Jayaprakash Madhavan, Dr. Cherian Varghese
Idoxifene Trial	Dr. S Parameswaran & Dr. N Geetha
PDT Trial	Dr. Iqbal Ahmed

7. NDGA profile Dr. Manoj Pandey
8. Pancreas project Dr. Jayaprakash Madhavan

Training

This division also provides training program for BSc. MLT students from Mahatma Gandhi University for two months.

Investigations carried out during the year 1999-2000

Biochemical Investigations	Total samples done	Haematological Investigations	Total samples done
Blood Glucose	38468	Hemoglobin	9230
Urea	37571	WBC	8647
Creatinine	37571	Platelet	7654
Uric acid	8800	RBC	5100
CCT	6058	PCV	5100
Bilirubin	20425	DC	6187
SGOT	21456	E.S.R.	6300
SGPT	21456	Bleeding time	6700
SAP	20657	Clotting time	6700
Total Protein	5758	Prothombin time	2000
Albumin	5758	APTT	800
Cholesterol	280	Urine Analysis	
HDL	30	Sugar	10800
Triglycerides	30	Albumin	1078
LDH	3780	Acetone	312
Amylase	76	Bile pigment	278
Magnesium	15	Urobilinogen	278
Acid Phosphate	50	Microscopy	387
Sodium	7875	Immunoglobulin Assy	
Potassium	7875	from Jan 2000	
Phosphorus	280	Ig A	120
CSF Sugar	271	Ig M	120
CSF Protein	271	Ig U7	120
CSF Microscopy	198		

DIVISION OF LIBRARY AND INFORMATION SERVICES

- Sri .M. Chandrakumaran Nair Senior Librarian
Ms. Deepika Lakshman Library Assistant
(left on 30.11.1999)
Mr. V. Vishnu Library Assistant
Mr. Saji. S. Nair Library Assistant
(joined on 23.12.1999)

With the adoption of modern technologies in every aspect of library management, the library services were more strengthened to support the increasing demand for information from clinicians, scientists, researchers and students who remained to be the primary users of the library. The information resources available and accessible in the library act as a major resource with contribute in a big way for the accomplishment of the objectives of the Centre. The noteworthy task accomplished during year under report is the introduction of CD ROM Network in the library. Steps are being initiated to organize on oncology information system for providing any required cancer information, a vital input for the increased productivity and patient care and research.

Progress in library computerization

Considerable progress has been made during the period in this area. With the support of STED project reported in the last year, a CD ROM network was established providing access to a number of databases on CD ROM. The major database subscribed to the library is cancer CD, which is the most comprehensive database on cancer covering both Medline and Embase. The abstract of this global database from 1984 to 2000 is available on the LAN terminals. The complete catalogue of the holdings of the library was also made available online on the nodes. As part of the computerization process, 'Alice for Windows' the integrated library management package was produced and steps have been taken to use this package for all activities related to library management.

Proposals to Review Committee

A detailed note on various issues relating to the problems and prospects of the library along with a development plan was prepared

and presented before the Review Committee appointed by the Governing Body of RCC during the report period. The same was discussed in the Library Committee also prior to the submission to the Review Committee.

Library Committee

During the report period, the Library Committee met three times and decisions were taken on various issues relating to the library. Dr. Sasidharan, Head of Imaging Division was nominated to the library committee in the place of Dr. Alex Ittyavirah who resigned from the Centre. Dr. Jayaprakash Madhavan and Dr. Sreejith Nayar were also nominated to the committee as new members.

RCC Publications

RCC publications database was updated adding 74 papers with informative abstracts contributed by the staff of the Centre during the period. This is found to be the remarkable number compared to previous years additions.

Training and sharing of professional experts

Training on CD search and other search facilities were organised for our Clinicians, Scientists and Researchers during the report year. M. Chandrakumaran Nair, Senior Librarian worked as coordinator and extended the professional expertise in the modernization of SCERT Library Trivandrum and for the organization of Dental College Library. He delivered five lectures on library and information science subjects to the M.Phil students of clinical epidemiology, Medical College.

External users

External users enjoyed free entry to the library and access to the library materials. Several Doctors, Researchers, students etc. from Medical Colleges, University Departments, Research institutes and other research organization visited the library and made use of the required materials.

Collection development

As in previous years, subscription to journals was given high priority. In view of financial constraints, cost escalation and the demand for more journals, the library committee reviewed the list and decided to discontinue 7 journals and to add five journals. The journals added during the year included 'Cancer Journal from Scientific American', 'Cancer Strategy', 'Journal of Biosciences', 'Journal of Cytology' and

'Pediatric Hematology Oncology'. The gift subscription was compensated to some extent by collecting the reprints free of cost from authors concerned and photocopies of articles from other Centres.

The collection development during the period are detailed below:

Category	Added during 1999-2000	As on March 2000
Documents		
Books, monographs & Back volumes	555	6930
Current Journals	5	104
Reprints & reports	302	3303
Audio/Video cassettes	8	103

Internet and e-mail facilities

Apart from the Medline data from 1966 to date available free of cost on Internet database like PDQ, CancerLit, etc. were largely used by the academic community. E-mail facility provided in the library is being utilized by all the divisions who have not Internet connection of their own.

Audio visual and reprographic support

Necessary arrangements were made for the provision of audio visual facilities and photocopying services for all the international/regional conferences hosted by the Centre and for various training programmes conducted by RCC during the period.

Current awareness service

Library continued the circulation of the fortnightly 'RCCL Current Contents' and 'Onconews' which carries the press clippings on oncology and related aspects. All other information services provided were also continued.

Conferences, etc. attended - (Chapter III)

Papers presented - (Chapter IV)

Papers published - (Chapter V)

DIVISION OF INFORMATION SYSTEMS

Mr. Neelakantan G - Sr. Systems Analyst
Mr. Manoj G - Jr. Systems Analyst

This division is responsible for the development and maintenance of application software for the computerization of various activities of Regional Cancer Centre. So far, this division introduced computers in Outpatients Departments (Registration, Appointment, Admission), Pharmacy and Store, Investigation Department (Cytology, Histopathology, Clinical Lab). All the above departments are connected to the central database in Ingres RDBMS platform. This division also maintains a database of members of Cancer Care for Life (Scheme 2 and 3) and also issues membership certificates. In addition to the above applications, which are all connected to the central system, Cash counters, Accounts, Radiation Physics and Cancer Registry are also supported by this division in development and maintenance of application software.

During the year the division initiated plans to expand computerization. As part of this, the three blocks are connected to Local Area Network using fibre optic links. With this, the number of users of the central computer system is increased to 45 from 12. The OP Cash counter, which had been working as independent system, is now connected to the central system along with all the investigation centres, and surgery department. All Application software for the newly computerized departments is developed in this division. The extension of computerization to the wards, investigation centre and OP cash counter will help to improve the patient services and better management.

This division is actively involved in the 'CancerNET, KERALA' a project being implemented jointly by ER&DC and RCC with financial assistance from Ministry of Information Technology, Government of India. Under this plan we will have a Web server at RCC through which we will offer online access to all sub-centres. The staff and doctors at any sub centre can submit a query and access information from the web-server of RCC, Trivandrum. The CancerNET project provide the technology to establish an internet based patient care system for RCC and provide an official web site for staff members without any additional cost.

Projects

1. Two students from University Institute of Technology (UIT), Trivandrum developed a project work named Outpatient Information System as part of their BSc. Computer Science of Kerala University.

2. A student from UIT, Trivandrum, developed a Minute Processing System as part of B.Sc. (Computer Science) of Kerala University.

3. A student from Bharathiyar University, Coimbatore has done a project on Radiation Treatment Planning System as part of his MCA.

Supported

As in earlier years, during this period also this division supported projects undertaken by RCC. The important among them are:

1. National Cancer Registry Programme (ICMR) - Hospital Cancer Registry
2. Natural Background Radiation Registry - Karunagappally
3. Trivandrum Oral Cancer Screening Trial - Trivandrum
4. Leukaemia Research Project
5. Trivandrum Population Based Cancer Registry Programme (IARC, France)

DIVISION OF COMMUNITY ONCOLOGY

Dr. Babu Mathew	-	Professor
Dr. Ramani Wesley	-	Assoc. Professor
Dr. Gigi Thomas	-	Lecturer
Sri. C. Sreekumar	-	Social Investigator

The major activities of this division are centred round, human resource development, awareness and detection camps, health education and community based cancer research.

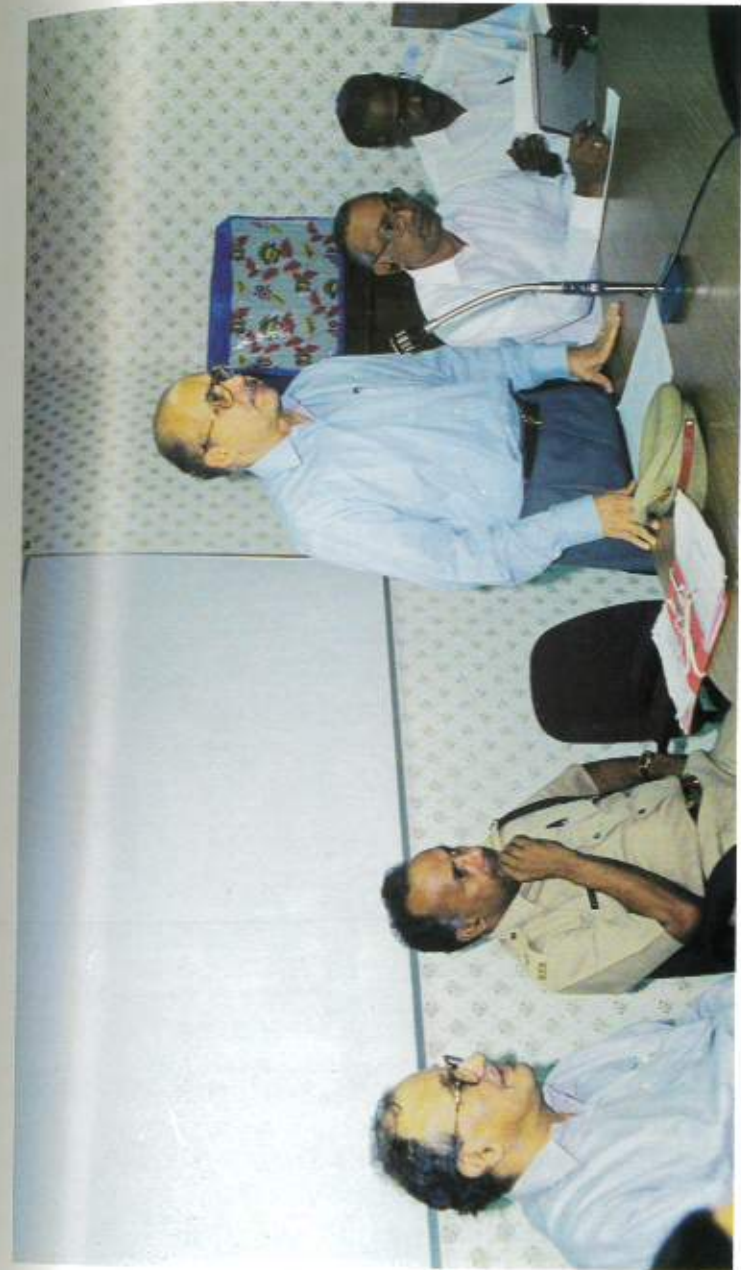
1. Human Resource Development

a) Professional education and training:

35 Dentists, 28 Gynaecologists, 1194 Health workers and 108 Nurses were trained in low cost cancer detection strategies and fundamentals of colposcopy to initiate cancer control in Tamilnadu. Intensive training was given for medical officers of ECDC, Ernakulam, Kollam, Pathanamthitta and Ambillikkai. Short-term training was given to nursing students of private hospitals and Government Medical Colleges and orientation training was given for cytotechnologists and cytotechnicians from other centres.

b) Public education

1. Fifty cancer awareness programmes were carried out to members of voluntary agencies. 3128 community volunteers, 320 NSS volunteers, 273 factory workers, 1194 ICDS Anganwadi workers, 97 literacy workers, and 511 religious leaders were specially trained in cancer awareness as key trainers. 3128 volunteers were trained for cancer survey and screening.
2. A cancer awareness cum tobacco awareness programme was given for key trainer teachers who in turn train teachers of all the districts. RCC has assisted in preparing a module for teachers and a chapter in textbook on Tobacco control for students.
3. Teachers, PTA and student representatives (891) were given Anti-tobacco education and cancer education classes.
4. Voluntary workers of HOPE Foundation were trained. The idea is to set out a new plan for cancer detection/prevention by regular house visiting in this district. They referred 59 suspected cases for confirmation of diagnosis.



A Seminar on "Improving Oral Morphine availability" was held at RCC on 9th June, 1989. R - L: Prof A.K. Chandrasekharan, Pharmacy College, Sri. S.S. Venkateshwar, Drugs Controller, Sri. V. Vijayachandran IAS, Secretary Health, Sri Abdul Sathar, Deputy Excise Commissioner and Dr. M. Krishnan Nair, Director, RCC.



2. Generation and distribution of health education materials

- a) About 200 slides and 2 photo albums on colposcopy were prepared for training. The health education materials generated during previous years were distributed among community volunteers and other target groups.
- b) Seven programmes through AIR Trivandrum Station were broadcast. Two programmes through ASIANET, 1 programme in Cable TV and two programmes through Doordarsan Kendra, Trivandrum were telecast during the period under report.
- c) Articles in Lay Press
 - 1) Ban on smoking in public places relevance of this judgment in the civilised world in Sathyadeepam, 2nd Nov, 1999.
 - 2) Cancer Niyanthranam, Panacea Vol(2), 1999
- d) Exhibitions
6 exhibitions were conducted which were viewed by more than 3 lakh people.
- e) Training Manuals, Modules and Atlas
 1. Teaching manual for Visual Inspection of Uterine Cervix with 4% Dilute Acetic Acid(VIA) and Lugol's iodine, International Agency for Research on Cancer, 1999
 2. John S Sellors, Sankaranarayanan R and Wesley Ramani S. An atlas cum teaching module for colposcopists on colposcopy and treatment of pre-invasive lesions(In press to be published by WHO).

3. Antitobacco programmes and campaigns

The major Antitobacco activity of the current year was targeted to teenage school children; in a programme called "Antitobacco revolution through schools". This project was carried out in collaboration with the Regional Cancer Association, Department of Education and Bharath Scouts and Guides Kerala State. Six posters, one leaflet and a sticker were designed for the programme. These were distributed to 6000 schools in the state with the request to observe 1-12-1999 as 'No Tobacco Day'. This activity was adjudged by the WHO as the best tobacco control work in the South East Asia and an award was given for this activity during the observance of the No Tobacco Day.

4. International School of Colposcopy:

An International School of Colposcopy to train Doctors, Gynaecologists, Nurses, Field-workers from developing countries was organised in the department in this year. A video colposcope is used for demonstration. We have already trained 10 Gynaecologists from Kerala in colposcopy, biopsy, treatment of preinvasive lesions by LEEP and cryotherapy. We are teaching doctors, nurses, field workers and technicians on low cost cervical cancer detection strategies like using acetic acid and Schiller's iodine to reveal cervical lesions. This division has helped in planning implementation and organisation of international school of colposcopy in Ambilliakkai, Tamil Nadu and Barseilly Cancer Centre, Maharashtra and trained 20 gynaecologists, 60 nurses and field workers in these States.

5. Early cancer detection clinic, Dysplasia clinic, Colposcopy clinic and Breast screening clinic

- a) An early cancer detection clinic is functioning in this department to examine patients with warning signals of cancer. We have a supplementary registration system in this clinic and have registered 2509 patients during this year. Through this clinic, 22 oral cancers, 29 breast cancers, 29 cervical cancers and 32 other cancers were detected. 239 oral precancerous conditions were diagnosed and kept under surveillance during this year.
- b) In the dysplasia clinic oral precancerous lesions like leukoplakias, SMF, Lichen Planus etc are treated either by chemoprevention or by excisions. Oral biopsies and excisions were done for 211 high-risk oral precancers. We have surgically excised 40 precancers.
- c) In the colposcopy clinic, 1445 colposcopies, 201 colpo directed biopsies, 10 LEEP diathermic excisions and 12 cryotherapies were done for cervical precancers.
- d) Breast screening clinic is conducted on Tuesdays and Thursdays. Here, propagation of breast self examination, screening through CAN-SCAN breast self examination software, FNAC's and discharge collection for cytology and referral for mammography are done. Since 10% of breast cancer patients who come to RCC are nuns, we have initiated cancer awareness cum screening programme for 72 nuns in convents and have detected 1 cancer and 5 atypias.

Peripheral Early Cancer Detection Programmes through ECDCs, Janakeeya Asoothranam programs and Village level Cancer Control Programmes

Early Cancer Detection Clinics (ECDC)

ECDC at Kollam started 2 years back is sending patients with precancers and cancers to this clinic for confirmation of diagnosis, colposcopy, LEEP etc. Early cancer detection work started in Kodungalloor named as Health Care Institute is conducting one camp in two months. We have trained doctors, nurses, health workers and volunteers who act as keytrainers for conducting comprehensive Village Level Cancer Control Programmes in Kodungalloor. A palliative care centre was also started. This centre is providing financial and moral support to all cancer patients and supply analgesics for pain control. ECDC Pathanamthitta, Community Oncology has helped in training Medical Officers and other health staff concerned with ECDC, Pathanamthitta.

The main stay of peripheral cancer detection programmes was through 27 cancer detection camps, the details of which are shown in Table No. 2

Seven panchayaths have taken up cancer control as part of their popular participation programme through Primary Health Centres. We have helped these Primary Health Centres to plan, organise training and implement this programme.

As part of Village Level Comprehensive Cancer detection programmes, seven new villages were included. 2434 volunteers were trained to carry out cancer related survey.

Community based Cancer Research

Ongoing research projects:

Evaluation of unaided visual inspection, cervicospopy and pap smear in screening for cervical cancer
(Funded by IARC, France)

Principal Investigator Dr. Ramani.S.Wesley
Co-Investigators Dr.Thara Somanathan, Dr.Namratha.
IARC Investigators Dr.Sankaranarayanan, Dr.D.M. Parkin

The study is to evaluate whether visual inspection of cervix using 3% acetic acid (cervicospopy) permits improved detection of invasive and pre Invasive lesions compared to unaided visual

inspection and to determine whether cervicoscopy can improve sensitivity of pap smear. The third phase of this study is going on this year including schiller's test, cervicoscopy, colposcopy and biopsy on all relevant cases to evaluate low cost technologies. We have recruited 1445 women this year. 13 cancers, 43 high grade lesions and 100 low grade lesions were detected.

2. Comparative evaluation of early detection of cervical cancer precursors by visual inspection with acetic acid and Schiller's Iodine

(Funded by IARC, France)

Principal Investigator Dr. Ramani.S.Wesley
 Co-Investigators Dr.Thara Somanathan, Dr.Namratha
 IARC Investigators Dr.Sankaranarayanan, Dr.D.M. Parkin

Objectives:

1. To estimate the sensitivity, specificity and positive (PPV) as well as negative predictive value (NPV) of visual inspection with acetic acid (VIA) and visual inspection with Schiller's iodine (VIS) in detecting cervical intraepithelial neoplasia (CIN) and cervical cancer.
2. To evaluate whether a combination of VIA and VIS in parallel improves early detection by increasing specificity without loss of sensitivity in comparison with either test alone;
3. To compare the performance of VIA, VIS and VIA plus VIS with that of cervical cytology.

We propose to carry out a formal evaluation of visual inspection with Schiller's iodine (VIS) as independent screening test or as an adjuvant to other tests in the early detection of cervical neoplasia. In particular, we wish to investigate whether an epithelium which is positive on both VIA and VIS is significantly more predictive of dysplasia as compared to situations where only one of the tests is positive. In other words, we wish to evaluate whether application of both tests (VIA plus VIS) can improve detection by augmenting specificity associated with single tests, without loss of sensitivity. Women aged 30 years and above attending the early detection programmes at the open-access clinics organized by the Community Oncology Department of the Regional Cancer Centre (RCC), Trivandrum, Kerala, India, will be recruited into the study.

Cervical Cancer Control Project

(Funded by Bill Gates Foundation, U.S.A)

Principal Investigator Dr.Ramani.S.Wesley
 Co-Principal Investigator Dr.B.Rajan
 Co-Investigators Dr.Namratha,
 Dr.Chitrathara, Dr.Paul Sebastian
 Dr.Thara Somanathan

The objective of this project is to start an International School of Colposcopy as a nodal training centre for developing countries where gynecologists, doctors, nurse practitioners, health workers can be given training on low cost cervical cancer detection strategies, colposcopy, Loop Electrosurgical Excision Procedures, Cryotherapy, Histopathology, biopsies etc. for investigating and therapeutic procedures of preventing cancer cervix. These trained personnel can go to their countries and start training of local people.

Evaluation of Oral Visual Inspection in the control of Oral Cancer

(Funded by IARC France and AICR U.K)

Principal Investigator Dr.Babu Mathew
 Co-Investigators Dr.M.Krishnan Nair,
 Dr.Manoj Pandey,
 Dr.Elizabeth Ninan, Dr.Gigi Thomas,
 Dr. Thara Somanathan,
 Dr. Iqbal Ahammed,
 Ms. Binu, Dr Ramadas.
 IARC Investigators Dr.R.Sankaranarayanan, Dr.P.Pisani
 and Dr.D.M.Parkin

The aim of this community based randomised intervention trial is to evaluate the effectiveness of mouth self examination by trained workers in preventing mouth cancers, detecting invasive oral cancer at an early stage and preventing deaths from oral cancer. Approximately 90,000 subjects aged 34 and above, living in two community development blocks of Trivandrum district, are recruited and randomised to screening and control arms. The subjects are advised to give up tobacco habits. Pre cancers and cancers are being treated. The study group are followed up for oral cancer incidence and mortality. The first phase of the study was completed on May 31, 1998. Among the 49,179 subjects screened by trained workers in the intervention area, 1350 patients were found to have precancerous

lesions. 308 biopsies and 120 surgical excisions were done for project patients. The second phase of the study is ongoing from June 1998. Among the 241477 screened in the intervention area, about 289 new cases were identified with precancerous lesions in the 2nd round. 186 biopsies and 40 surgical excisions have been performed in the second phase of the study.

5. Evaluation of Chemoprevention of Oral cancer with long term administration of Vit A in subjects at high risk

(Funded by IARC France and AICR U.K)

Principal Investigator	Dr.Babu Mathew
Co-Investigators	Dr.M.Krishnan Nair, Dr. N Sreedevi Amma, Dr. Ramadas, Dr.Sudhakaran P.P, Dr. P.P Nair
IARC Investigators	Dr.R.Sankaranarayanan, Dr. D.M. Parkin

Cases of Leukoplakia recruited in the TOCS study that cannot be surgically excised are recruited for the chemoprevention study. The subjects are randomised into 2 groups and the intervention group is given 20,000 IU of Vitamin A monthly for a period of 6 months. These patients are evaluated every 3 months and lesions, which become excisable, are surgically excised. So far, 262 patients were recruited for the study.

6. Study of Tobacco Related mortality in Trivandrum District
(Funded by Oxford University, U.K)

Chief Investigator	Dr.Babu Mathew
Co-Investigator	Dr. M. Krishnan Nair
External Investigators	Dr.Richard Peto, Dr.R. Sankaranarayanan

Information was collected about the deaths that have occurred between 1995-1999 December from 14 panchayaths of the Trivandrum district. Information is collected about the dead by a special investigator from the surviving spouse or nearest relative. The hospital records if any available are examined and cause of death is ascertained by a panel of doctors by studying the information collected. The dead are members of a cohort of the TOCS study and therefore, the information is available in the TOCS data bank about their tobacco alcohol habits. Analysis of the deaths up to December 1999 is being carried out.

Global Youth Tobacco Survey Programme
(Funded by WHO Geneva)

Chief Investigator	Dr.Babu Mathew
Co-Investigator	Sri.C.Sreekumar
External investigator	Dr.Warren Wick, CDC, Atlanta, U.S.A. Dr.Derek Yach, WHO, Geneva Dr.R.Railey, WHO, Geneva

This is a programme to conduct a KAP survey of tobacco; among school children aged 13-15 years in Kerala. This is the part of a global study and 6 states in India are taking part in it. It is expected to formulate strong tobacco control legislation, nationally and internationally after getting information from the study.

Other activities:

Assistance to Thesis/Dissertation/ Projects

1. Projects

Assistance in the design, implementation and analysis has been provided to researchers, postgraduate students (for dissertation and thesis) MSc nursing and MSW students and college/school students to prepare their project work. In addition we have participated in the academic activities of the centre and contributed to the research activities of other divisions.

2. Welfare activities for the poor

With the help of Social investigators and doctors of this division we have provided counselling, financial help, and arranged accommodation facilities to poor patients and acted as liaison between rural camp patients and RCC.

3. Provision of information

To many patients, bystanders, voluntary agencies through person-to-person communication, leaflets, pamphlets, books, and exhibits information about cancer was given routinely. Psycho-social support was given by this division for removal of cancer stigma and for motivation of patients to undergo treatment.

Fellowships and training:

Dr. Ramani.S.Wesley received ICRETT Fellowship on Colposcopy, VEEP and cryotherapy from McMaster University, Canada for one month from May 15 - June 20.

Sri.C.Sreekumar was deputed for special training programme on cancer rehabilitation at Indian Cancer Society, Mumbai from 15-4-99 to 5-5-99.

Sri.C.Sreekumar had participated in the Training programme of "MSM power development on palliative care under WHO, Biennium 1998-99" on 15th and 16th November, 1999 at Indira Gandhi Institute of Medical Sciences, Patna.

Awards received

Dr.Gigi Thomas was awarded Dr.Masharanhas Memorial Trophy for the best paper presented at the scientific session of the 3rd Triennial Commonwealth Dental Association and 54th Indian Dental Association Congress, New Delhi, Jan. 28th to 1st Feb. 2000 for the paper "Trivandrum Oral Cancer Study - early results of surgical excision of oral pre-malignant lesions" based on the work done by TOCS project

Table 1
Details of Cancer Awareness Programmes 1999-2000

SL.NO	DATE	PLACE	ORGANISED BY	NO. AT- TEND- ED	TYPE OF PARTICIPANTS
1	09/04/99	Konni	Rotary Club, Konni	380	Anganwadi workers & Health workers
2	24/04/99	Pallimukku Pampadi	Ferone Church	155	Religious organisational women
3	01/05/99	Pampadi	Redcross and SBT Pampadi	282	Community volunteers
4	20/05/99	Aranmula	Aranmula Panchayath	350	Lay Public
5	23/05/99	Pandalam	Indian Dental Association	35	Dental Surgeons
6	02/06/99	Perorkada	Concordia H.S Perorkada	280	Teachers & Plus II students
7	06/06/99	RCC	RCC	15	Nurses
8	07/06/99	RCC	RCC	8	Doctors (General Practitioners)
9	21/06/99	Vallana	Vallana Panchayath Janakeeya Asoothranam)	276	Community Volunteers
10	23/06/99	Perumpazhuthoor	Janakeeya Asoothranam	427	Anganwadi workers and Health workers
11	24/07/99	Kudappanakunnu	Regional Cancer Association	250	Lay Public
12	14/08/99	Sasthamcotta	Sasthamcotta NSS College	320	NSS leaders
13	17/08/99	RCC	RCC (Colprotraining)	2	Gynaecologists
	19/08/99				
14	04/09/99	Allappuzha	Little way Association	72	Nuns
15	09/09/99	Veitlanad	Community Medicine, Medical College, Trivandrum	412	School children

Table 1 Contd.

SL.NO	DATE	PLACE	ORGANISED BY	NO. ATTENDED	TYPE OF PARTICIPANTS
16	13/09/99	RCC	RCC	4	Post graduateMSW students
17	28/09/99- 29/09/99	RCC	Christian Mission Hospital Ambillikkai	3	Doctors
18	30/09/99- 02/10/99	RCC	"	8	Nurses
19	04/10/99	RCC	RCC	12	Staff Nurses
20	13/10/99	Veli	Saksharatha Samithi	97	Literary workers
21	15/10/99	Trivandrum	St.Joseph High School	550	Students and teachers
22	16/10/99	Pottakuzhy	Pottakuzhy Residence Association	45	Lay public
23	20/10/99	Muttada	Swasthraya	194	Religious organisational members
24	25/10/99	RCC	Mookambika Nursing College	35	Nursing students
25	26/10/99	RCC	"	42	"
26	28/10/99	Nemom	PHC Nemom	403	Community Volunteers
27	17/12/99	Neyyattinkara	ER&DC,Snehadeepam	378	Anganwadi Healthworkers
28	24/12/99	Poyad	Poyad Resident's Association	56	Lay Public
29	28/12/99	Trivandrum	Government Press	120	Employees
30	31/12/99	Pathanapuram	Janakeeya Asoothranam	425	Lay Public
31	11/01/00	Palasghat	Akathethara PHC	92	Professors, Teachers and Training College staff
32	12/01/00	Kulamadu	Kulamadu Panchayath	304	Health workers, Anganwadi workers, St.Teachers

Table 1 Contd.

SL.NO	DATE	PLACE	ORGANISED BY	NO. ATTENDED	TYPE OF PARTICIPANTS
33	14/01/00	Neyyattinkara	Snehadeepam	456	Health workers, Anganwadi workers
34	22/01/00	Melaranoor	Poojappura Govt.Quarters Association	230	Lay Public
35	24/01/00	Thycaud	Health Inspectors Training Centre	24	Health Inspectors
36	26/01/00	Karavaram	Karavaram Residence Association	64	Lay Public
37	27/01/00	RCC	Health Inspectors Training Centre	20	Health Inspectors
38	28/01/00	Pathanapuram	YMCA,Pathanapuram	285	Community Volunteers
39	02/02/00	RCC	Christian Medical Centre, Ambillikkai	37	Nurses and Health workers
40	05/02/00	RCC	Christian Medical Centre, Ambillikkai	3	Doctors
41	09/02/00	Statue	Govt.Press Trivandrum	273	Press employees
42	15/02/00- 18/02/00	Barsi	IARC	14	Gynaecologists
43	19/02/00- 22/02/00	Barsi	IARC	15	Field workers and nurses
44	26/02/00	Pathanapuram	Littleway Association	150	Lay Public
45	01/03/00	Oorootambalari	P.T.A Govt.H.S	500	Parents, Teachersand students
46	03/03/00	Panachikkad	Panachikkad	85	Health workers &Anganwadi workers
47	05/03/00	Kannur(Mavilayil)	Malabar Cancer CareSociety	176	Community Volunteers
48	15/03/00	RCC	RCC	4	M.Sc Nursing students
49	18/03/00	Pattakulam	Bethel Marthoma Church	162	Religious organisational members
50	26/03/00	Panamattam	DesiyaVayanasala	280	Community volunteers

Table 2
Details of cancer detection camps 1999-2000

Sl.	Date	Place	Organised by	Total Screened	New cancers	Old cancers	Oral pre-cancers	Other pre-cancers
1	09-04-99	Konni	Lions Club	430	7	-	27	9
2	10-04-99	Karakulam	AmmanNagar Resident's Association	112	-	-	7	2
3	16-04-99	Pallimukku	Vincont 'D' Paul Society	85	-	-	3	2
4	18-04-99	Kodungalloor (Irinjalakuda)	Health Care Institute	250	5	-	5	3
5	18-05-99	Pampadi	Redcross&SBT	232	1	-	13	7
6	02-07-99	Vallana	Janakeeya Asoothranam Vallana Panchayath	346	3	-	7	5
7	04-09-99	Allappuzha	Littleway Association	72	1	-	-	4
8	17-09-99	Poojappura	Central Jail, Poojappura	48	-	-	-	8
9	20-09-99	Kollam	ECDC Kollam & ESI Hospital	412	2	-	18	20
10	26-09-99	Kodungalloor (Pulloof)	HealthCare Institute	450	6	-	11	8
11	02-10-99	Vellayani	Agricultural College	240	-	-	3	-
12	09-10-99	Chempazhanthi	B.ScNursing students	360	5	-	2	9
13	11-10-99	Kalayapuram	Besilious Church	150	4	0	6	8
14	27-11-99	Kayamkulam	Lions Club	156	2	-	8	5
15	19-12-99	Vettukad	Y's men	12	-	-	-	-

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Sl.	Date	Place	Organised by	Total Screened	New cancers	Old cancers	Oral pre-cancers	Other pre-cancer
16	27-12-99	Vombayam	Sahodara Samajam	104	2	-	18	-
17	03-01-00	Kochuveli	Little Flower Convent	172	2	0	9	2
18	08-01-00	Vettinad	YMCA	85	2	0	8	5
19	14-01-00	Perumpazhudoor	Snehadeepam	169	3	0	5	3
20	06-02-00	Kamaleswaram	Lion's Club	212	1	0	4	5
21	09-02-00	Statuc,Trivandrum	Govt.Press	40	0	0	2	2
22	14-02-00	Chittazha	Sai Chaitanya	85	2	0	12	6
23	12-03-00	Nellimood	SBT	325	2	1	6	4
24	17-03-00	Olaihanthi	PHC,Perumpazhudoor	154	1	-	-	15
25	20-03-00	Maranalloor	PHC, Perumpazhudoor	135	1	0	2	12
26	29-03-00	Vellarada	PHC, Vollarada	136	0	0	3	25
27	31-03-00	Panachikkad	Janakeeya Asoothranam	398	4	1	12	15
TOTAL				5368	56	2	187	184

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Conferences, etc. attended - (Chapter III)

Papers presented - (Chapter IV)

Papers published - (Chapter V)

DIVISION OF E.C.D.C, ERNAKULAM

Dr. Syamalakumari - Cytopathologist

The main activities of this centre include, conduct of cancer detection camps, awareness programmes and cytology and histology work. This centre is also doing colposcopy directed biopsy services.

The follow-up clinic and pain clinic and the district cancer control programme are functioning well. The data are presented in the following tables.

Table - 1
Resume of work done 1999-2000

Particulars of work done	ECDC	DCCP	Total
Persons screened	6235	4109	10344
Cervical smears	3464	2668	6132
Oral smears	215	380	595
Fine Needle Aspiration	1986	559	2545
Sputum cytology	59	...	...
Histopathology	65	...	...
Colposcopy	39	...	...
Colpodirected Biopsy	26	...	...
Body fluids	26	...	...

Table - 2
Gynecological cytology

Lesion	Centre	Follow-up	Total
Normal	201	68	269
Inflammation	1559	649	2208
Atypical glandular cells	38	18	56
Trichomonas Vaginalis Infection	448	106	554
TV with mild dysplasia	23	15	38
TV with moderate dysplasia	3	1	4
TV with severe dysplasia	4	-	4
Fungal Infection	6	3	9
TV with fungus	1	-	1

Human Papilloma Virus Infection	3	1	4
Herpes simplex virus infection	83	26	109
Infection with virus	22	7	29
Infection with mild dysplasia	21	7	28
Infection with moderate dysplasia	8	3	11
Mild dysplasia	45	19	34
Moderate dysplasia	7	2	9
Severe dysplasia	7	6	13
Atrophic atrophy	1	-	1
Carcinoma In-situ	4	1	5
Invasive squamous cell carcinoma	30	-	30
Adenocarcinoma	3	-	3
Miscellaneous	7	1	8
Infection with severe dysplasia	6	1	7
Total	2530	934	3464

Table - 3
Non-gynaecological cytology

Lesion	Total
Oral lesions	
Benign	65
Pre-malignancy	37
Malignant	112
Radiation changes	1
Total	215
Breast	
Benign	647
Suspicious	3
Malignant	113
Miscellaneous	2
Total	765
Thyroid	
Benign	501
Suspicious	5
Malignancy	40
Total	548

Lymphnode	
Benign	32
Malignancy	
a. Primary	7
b. Secondary	52
Total	391
Salivary Gland	
Benign	34
Malignancy	6
Miscellaneous	4
Total	44
Liver	
Benign	7
Malignancy	5
Total	12
Lungs	
Benign	2
Malignancy	1
Total	3
Other Sites	
Benign	146
Suspicious	3
Malignancy	21
Miscellaneous	3
Total	173
Body fluids	
Ascitic fluid	
Benign	2
Malignancy	3
Total	5
Pleural fluid	
Benign	18
Malignancy	2
Total	20
Peritoneal fluid	
Benign	1
Nipple discharge	
Benign	50

Table - 4
Sputum Cytology

Lesion	Total
Benign	51
Malignancy	6
Miscellaneous	2
Total	59

Table - 5
Histopathologic Examination

Specimen	Benign	Ca-in-situ	Malignant	Total
Cytopathological	27	6	3	36
Breast	5	-	10	15
Other sites	10	-	4	14
Total				65

Table - 6
Work done DCCP - April 1999 - March 2000

Total persons screened	4,101
Oral	
Non-malignancy	318
Pre-malignant lesions (Clinical/Cytological)	53
Malignancy	9
Total oral smears	380
Breast	
Non-malignancy	111
Malignancy	10
Miscellaneous	23
Total breast aspiration	144
Cervix	
Non-malignancy	2,464
Pre-malignant lesions	192
Malignancy	12
Total cervical smears	2,668

Thyroid	Benign
	Malignancy
	Suspicious
	Atypia
	Miscellaneous
Total thyroid aspiration	
L.N	Benign
	Granulomatous
	Suspicious
	Miscellaneous
	Malignancy
Total L.N aspirations	
Other	NMC
	Suspicious
Sites	Malignancy
	Miscellaneous
	Total

DIVISION OF E.C.D.C, PALAKKAD

Dr. R. Ananda Kamath - Cytopathologist
Smt. Veena V.S. - Cytotechnologist

The Early Cancer Detection Centre is located at Kanjikkode, which is an industrial area in Palakkad District.

The main activities of this centre are creating cancer awareness among the public and screening them for warning signals. The screening is done at the centre (for referred cases and patients coming voluntarily) and by conducting cancer detection camps in rural and urban areas of Palakkad and other northern districts of Kerala, with the help of voluntary organisations and Grama Panchayat (through "Janakeeyasoothranam Padhathi").

Cytologic specimens were collected from suspected cases and subjected to microscopic study. Detected cancer cases were referred to RCC or other cancer hospitals for treatment and further management.

The pain and palliative care clinic is beneficial to incurable and terminal cancer patients of northern districts of Kerala and 45 new patients registered this reporting year.

Summary of work done during the year 1999-2000.

Total number of persons screened	-	2,543
Number of persons screened in the camp	-	1,540
Number of persons screened in the centre	-	1,003

Table 1. Details of cytological smears for the year 1999-2000

Specimen	ECDC	Camp	Total
Technical cytology	211	274	485
Oral cytology	82	20	102
Sputum cytology	186	-	186
Breast (FNAC)	44	4	48
Thyroid (FNAC)	2	3	5
Lymphnode (FNAC)	6	1	7
Fluids	5	-	5
Nipple discharge	5	-	5
Other sites	31	19	50
Total	572	321	892

Table - 2
Analysis of Gynaecological specimens 1999-2000

Lesion	Centre	Camps	Total
Normal	8	47	55
Inflammation	90	154	244
Inflammation with glandular cell proliferation	15	7	22
Trichomonas vaginalis infection	16	23	39
Fungal infection	3	6	9
Viral infection	4	-	4
Infection with mild dysplasia	27	18	45
TV infection with mild dysplasia	4	3	7
Fungal infection with mild dysplasia	2	3	5
Mild dysplasia	1	1	2
Glandular cell atypia	13	8	21
Inflammation with moderate dysplasia	3	3	6
Severe dysplasia/Carcinoma in-situ	1	1	2
Suspicious	3	-	3
Squamous cell carcinoma	10	-	10
Adeno carcinoma	1	-	1
Radiation changes	3	-	3
Miscellaneous	7	-	7
Total	211	274	485

Table - 3
Analysis of Non-Gynaecologic lesions for the year 1999-2000

Specimen	Centre	Camp	Total
Oral smear			
Normal	27	5	32
Inflammation	17	4	21
Fungal infection	1	-	1
Dysplasia	20	9	29
Atypical/Suspicious	10	-	10
Malignant	6	2	8
Total	82	20	102
Sputum cytology			
Non-malignant	152	-	152
Atypia/Suspicious	20	-	20
Malignant	14	-	14
Total	186	-	186

Breast (FNAC)			
Non-malignant	32	3	35
Fibro-adenoma	6	1	7
Atypia/Suspicious	5	-	5
Malignant	1	-	1
Total	44	4	48
Thyroid (FNAC)			
Non-malignant	2	3	5
Total	2	3	5
Lymphnode			
Non-malignant	3	-	3
Lymphadenitis	3	-	3
Malignant	-	1	1
Total	6	1	7
Fluids			
Non-malignant	5	-	5
Total	5	-	5
Nipple discharge			
Non-malignant	5	-	5
Total	5	-	5
Other sites			
Benign	25	19	44
Atypical	4	0	4
Malignant	2	0	2
Total	31	19	50
Total non-gynaecological specimens	361	47	408

Table - 4
Pain and palliative care clinic, 1999-2000

	Numbers
New cases registered	45
Step I	5
Step II	12
Step III	28
Follow up cases	139

**CONFERENCES/SEMINARS/TRAININGS
WORKSHOPS, ETC. ATTENDED -
BY VARIOUS STAFF**

Ms. Aleyamma Kunnappally
Head Nurse
Workshop on update on management technique for Head Nurses and Nursing Superintendents of Kerala College of Nursing, Trivandrum, May 19-28, 1999.

Dr. Aleyamma Mathew
Asst. Professor of Computational Statistics and Epidemiology
Invited lecture, CME and first triennial conference of Academy of clinical microbiologists, Trivandrum, September 1-2, 1999.

"
Invited lecture, National Seminar on Probability models and application in statistics, Department of Statistics, University of Calicut, February 24-25, 2000.

"
17th Annual conference of Indian Society for medical statistics, Bangalore, 1999.

"
15th Asia Pacific Cancer Conference, Madras, 1999.

Ms. Aleykutty PM
Staff Nurse
CME programme-professionals, A change to nurses, College of Nursing, Trivandrum, November 17-18, 1999.

All Blood Bank Staff
Annual conference of ISBT (Kerala Chapter), Alleppey, April 24, 1999.

All Radiation Physics Staff
International conference on Radiobiology (Radiology 2000), ISRB & Regional Cancer Centre, Trivandrum, February 17-19, 2000.

"
CME - Safety Accuracy Quality (SAQ), Regional Cancer Centre, Trivandrum, October 9-11, 2000.

Ms. Anilakumary S
Staff Nurse
Workshop on human relations in nursing, College of Nursing, Trivandrum, June 8-18, 1999.

Dr. Anitha Mathew
Asst. Prof. in Cytopathology
Workshop and CME on Paediatric and perinatal pathology, Medical College, Trivandrum August, 1999.

"
Recent trends in the management of brain tumours, SCTIMST, Trivandrum, September, 1999.

"
29th Annual conference of Indian Academy of Cytologists, Mangalore, November, 1999.

"
CME on Thoracic Cytology, Mangalore, November, 1999.

Ms. Annamma Jacob
Head Nurse
Update on quality care for nurse managers, College of Nursing, Trivandrum, April 29-30, 1999.

Dr. Aswin Kumar
Lecturer in Radiotherapy
WHO sponsored workshop on carcinoma cervix, Calcutta, December, 1999.

Dr. Babu Mathew
Professor of Community Oncology
ICMR Expert committee meeting on establishment of a District level Cancer Control Programme for Greater Delhi, ICMR Headquarters, New Delhi, June 1999.

"
ICMR Expert committee meeting on Brain Stroming session on Preventive Oncology, Institute of Cytology and Preventive Oncology, New Delhi, October 4-6, 1999.

"
WHO International Conference on Global Tobacco Control Law (Preparatory meeting), New Delhi, October 8-10, 1999.

"
International Conference on Heart Health in Developing countries, New Delhi, October 10-14, 1999.

Workshop on human relations in nursing, College of Nursing, Trivandrum, June 8-18, 1999.

Workshop and CME on Paediatric and perinatal pathology, Medical College, Trivandrum August, 1999.

Recent trends in the management of brain tumours, SCTIMST, Trivandrum, September, 1999.

29th Annual conference of Indian Academy of Cytologists, Mangalore, November, 1999.

CME on Thoracic Cytology, Mangalore, November, 1999.

Update on quality care for nurse managers, College of Nursing, Trivandrum, April 29-30, 1999.

WHO sponsored workshop on carcinoma cervix, Calcutta, December, 1999.

ICMR Expert committee meeting on establishment of a District level Cancer Control Programme for Greater Delhi, ICMR Headquarters, New Delhi, June 1999.

ICMR Expert committee meeting on Brain Stroming session on Preventive Oncology, Institute of Cytology and Preventive Oncology, New Delhi, October 4-6, 1999.

WHO International Conference on Global Tobacco Control Law (Preparatory meeting), New Delhi, October 8-10, 1999.

International Conference on Heart Health in Developing countries, New Delhi, October 10-14, 1999.

"	15th Asia Pacific Cancer Conference under the auspices of Asia Pacific Federation of Cancer Congresses, Chennai, December, 12-15, 1999.	Dr. M. Chandrakumaran Nair Librarian	National Convention of Medical Library Association of India, Navi Mumbai, 1999.
"	WHO International Conference on Global Tobacco Control Towards a WHO. Framework convention on Tobacco control, Delhi, January 7-9, 2000.	"	One day workshop on Information infrastructure, Organised by INSDOC, Kerala Agricultural University, Thrissur, March 24, 2000.
"	WHO workshop on Global Tobacco survey for South East Asia, Goa, India, February, 14-15, 2000.	Dr. P. Chandralekha Professor In Cytopathology	CME Programme on pre-analytical variables during blood collection, July, 1999
Dr. Bhattathiri VN Assoc. Professor in Radiotherapy	Ozone Hole and Cancer under the aegis of STEC, Govt. of Kerala, April, 1999.	"	29th Annual conference of Indian Academy of Cytologists, Mangalore, November, 1999.
"	Seminar on diet and cancer, Cancer Hospital, Trichur, April, 1999.	Dr. Sherran Varghese Professor of Cancer Epidemiology & Clinical Research	CME on Thoracic Cytology, Mangalore, November, 1999.
"	Invited lecture, Symposium on trends in Biomedical Research, Institute of Fundamental Research, Mumbai, September 27-29, 1999.	"	Global Challenge of Cervical Cancer Prevention: EUROGIN-2000, Paris, April 5-9, 2000.
"	Radiation protection meeting, organised by BARC, Mumbai, December 20-21, 1999.	"	15th International Scientific Meeting of International Epidemiology Association. Florence, Italy, August 31 to September 4.
Ms. Bindhu B Staff Nurse	Endoscopy training-Endos-therapy, GEC, Coimbatore, 1999.	Dr. Christeen V Staff Nurse	Endoscopy training-Endos-therapy 99, GEC, Coimbatore, 1999.
Smt. Bindu L Cytotechnologist	A seminar on Geriatric Heart, Trivandrum, October 23, 1999.	Ms. Bisamma Joseph Staff Nurse	7th International conference on palliative care.
"	33rd Annual CME of the Millers, Trivandrum, January 8-9, 2000.	"	Kidwai Memorial Institute of Oncology, Bangalore, February, 17-19, 2000.
"	19th Annual convention of Indian Association for Cancer Research and symposium on Cancer Biology, Amala Cancer Hospital and Research Centre, January 21-23, 2000.	Dr. Elizabeth K Abraham Professor in Cytopathology	15th Asia Pacific Cancer Conference, Madras, December, 1999.
"	12th Twelfth Kerala Science Congress, Peerumedu, January 27-29, 2000.	Dr. Elizabeth Mathew Iype Medical Officer in Surgical Oncology	Cadaver dissection programme of medialisation thyroplasty in Dysphonia and Phono Surgery workshop, Planetarium, Trivandrum, November 1999.

" Asia Pacific Cancer Congress
Chennai, December 1999.

" National annual conference of the
association of otolaryngologists
India. Cochin, January 2000.

" Indo-American oncology seminar
held in RCC, Trivandrum, February
2000.

" State annual conference of the
association of otolaryngologists
India. Cochin, May 2000.

Ms. Elsamma Joseph
Staff Nurse
Training programme on Training
trainers, Palliative Care Society
Calicut, June 13-20, 1999.

Dr. Firoz R.
Lecturer in Surgical Oncology
15th Asia Pacific Cancer Congress
Chennai, December, 1999.

" ASI - Kerala Chapter, Kozhikode,
February, 2000.

Dr. Francis V James
Assoc. Professor in
Radiotherapy
21st AROI Conference, Calcutta,
December, 1999.

" Meeting of the Research team of
pancreatic cancer using farnesyl
inhibitor, London, February, 2000.

Dr. V.P. Gangadharan
Assoc. Professor in
Medical Oncology
Management of acute leukaemia
CME, Amala, Cancer Hospital,
Trichur.

" Cancer drug update - Newer
pyrimidines, KMIO, Bangalore.

" Recent advances in the
management of ovarian tumours
CME, Dept. of OBG, Trissur.

" Neuro Oncological aspects of
Dementia - Society for
rehabilitation of cognition and
communication disorders,
Trivandrum.

" Advances in the management of
germ cell tumours of the ovary. Indian
academy of human reproduction,
Cochin.

" Stress and cancer, CME
association of physiologists and
pharmacologists, Trivandrum.

" Management of malignant bone
tumour, CME, Association of
orthopaedic surgeons, Trivandrum.

" Management of hepatocellular
carcinoma, Gut club, Cochin.

" Post transplant malignancies,
Uroclub, Cochin.

Dr. Geetha N
Assoc. Professor in
Medical Oncology
31st Annual meeting of the
American Society of
Hematology, New Orleans, USA,
December 3, 1999.

Ms. Geethakumari BS
Head Nurse
15th Asia Pacific Cancer
Conference, Poster
presentation on Nurses role in the
rehabilitation of patients with
ostomy, RCC experience, Chennai,
India, December 12-15, 1999.

Dr. Gigi Thomas
Lecturer in Community
Oncology
3rd Triennial Commonwealth
Dental Association
and 54th Indian Dental Association
Congress, New Delhi, January 28
to February 1, 2000.

Ms. Graceamma Joseph
Nursing Superintendent
State level workshop on cardiac
and neuro nursing, SCHIMST,
Trivandrum, September, 1999.

" Sensitivity training to get things
done effectively, Centre for
professional development,
September, 1999.

Dr. Jayaprakash Madhavan
Assoc. Prof. in Radiotherapy
International Oncology Update,
Agra

Dr. K. Jayasree
Assoc. Prof. in Cytopathology

"

"

Ms. Jaya TS
Head Nurse

Dr. M. Krishnan Nair
Director

Ms. Kumari Thankom
Nursing Officer-in-charge

"

Dr. Kusumakumary P
Assoc. Professor in
Paediatric Oncology

"

CME Programme on recent trends
in the management of brain tumours,
Trivandrum, September, 1999.

CME on Thoracic Cytology,
Mangalore, November, 1999.

29th Annual conference of Indian
Academy of cytologists,
Mangalore, November, 1999.

15th Asia Pacific Cancer Conference,
Poster presentation on Nurses
role in the rehabilitation of patients
with ostomy, RCC experience,
Chennai, India, December
12-15, 1999.

Guest lecture, Cancer vaccines,
SASICME 99, West Bengal Chapter,
Calcutta, September 18-19, 1999.

Invited talk, Grief & Bereavement
Home care - Palliative Care
delivery, 7th International
conference of IAPC, Bangalore,
February 17-19, 2000.

Invited lecture, Assessment and
management of lymphoedema -
Grief & bereavement - Wound care
& Bed sore management,
Foundation course on Palliative
Care, Calicut, 2000.

Invited talk, Late effects of treated
leukaemia.
National workshop on teenage
care and counselling, Cochin, July
31st and August 1st, 1999.

Invited talk, Management of Blood
99 - CME in Hematology,
Towers by Malabar childhood
cancer society, Calicut, September
25-26, 1999.

"

Dr. R. P. T.
Professor in Sociology

"

Dr. Manjula
RCC

Dr. Manoj Pandey
Asst. Professor in
Surgical Oncology

"

"

"

Invited talk, Neuroblastoma in
children - CME in Paediatric
hematology/oncology, CMC Vellore,
January 7-8, 2000.

"Cancer a challenge to present day
society". National Seminar on
Kerala's, Development
perspectives - Department of
Demography, University of Kerala,
March, 2000.

International conference of IAPC
on palliative care, Bangalore,
February 17-19, 2000.

Training programme of "Manpower
development on palliative care"
under WHO biennium 1998-99,
RCC, IGIMS, Patna, November
15-16, 1999.

Guest lecture, Surgery for oral
cancer. CME for Dental house
surgeons, Regional Cancer Centre,
Trivandrum, July 4, 1999.

Guest lecture, Cancer vaccines.
In SASICME 99, West Bengal
Chapter, Calcutta, September
18-19, 1999.

Guest lecture, Reconstruction using
pedicle flaps for oromandibular
reconstruction. Symposium on
oromandibular cancer in IASO
NATCON 99, Jolly Grant, Dehradun,
October 8-10, 1999.

Guest lecture, Decision making in
head and neck cancer. Surgical
update and CME 99, Dept. of
Surgery and Kerala Chapter of ASI,
Medical College, Trivandrum,
October 15-17, 1999.

Mr. P. Meera Sahib
Senior Scientific Officer

" Guest lecture, Moving the project
CME and workshop on medical
research. Dept. of Surgery, Medical
College, Thrissur, Kerala,
December 4-6, 1999.

" Guest lecture, Presenting data
CME and workshop on Medical
Research, Medical College,
Thrissur, December 4-6, 1999.

" Guest lecture, Faculty member
workshop on medical research
CME and workshop on Medical
Research, Medical College,
Thrissur, December 4-6, 1999.

" Asia Pacific Cancer congress,
Chennai, December 12-15, 1999.

" Guest lecture, Approach to patient
with metastasis of unknown origin
presenting with cervical neck node
Symposium on MUO neck, IASO
section, ASICON 99, Madurai,
December 16-30, 1999.

" ASICON 99. Annual conference of
association of surgeons of India,
Madurai, December 26-30, 1999.

" Guest lecture, Malignant mucosa
melanoma. Meeting of Kerala
Chapter of Indian Association of
Radiation Oncologists, Kerala
Chapter, Trivandrum, Kerala.
February 6, 2000.

" 24th National conference and
international CME
on Indian Society of Blood
Transfusion and
Immunohaematology, Sanjay
Gandhi Postgraduate Institute of
Medical Sciences, Lucknow.
November 27-30, 1999.

Ms. Mini Lal KM
Staff Nurse

Mr. Mohanachandran C
Medical Record Assistant

Dr. Mallina Kumary KR
Lecturer in Dental Care

Dr. Namrata Dhakad
Asst. Prof. in Surgical Oncology

Training programme on manpower
development on palliative care
under WHO biennium 1998-99,
Patna, November, 1999.

National Conference on Medical
Records Management, Meenakshi
Mission Hospital, Madurai.

15th Asia Pacific Cancer
Conference, Chennai, India,
December 12-15, 1999.

Lecture on, "Treatment of cervical
cancer", Training programme for
Medical Officers on awareness and
early detection of cancer. Regional
Cancer Centre, Trivandrum,
August, 2000.

" Trivandrum surgical update.
Conducted by the dept. of Surgery,
Medical College, Tvm, in
association with Association of
Surgeons of India, Kerala Chapter,
October, 1999.

" Lecture on, Conservative
management of cancer
endometrium for obstetric and
gynaecology club, Trivandrum,
December 1999.

" Indo-American Oncology Seminar-
Regional Cancer Centre,
Trivandrum, February, 2000.

" Doppler workshop, AMC
auditorium, SCTIMST, Trivandrum,
February 2000.

" Advanced international workshop
on cancer in pain management and
palliative care - Regional Cancer
Centre, Trivandrum, June 2000.

" Lecture on, Radical pelvic surgery
and secondary cytoreduction,

Trivandrum O&G 2000 CME and conference, Medical College, Trivandrum, June 2000.

"

Lecture on, Surgical management of epithelial ovarian cancer and experience, Oncology Key session of the federation of obstetric and gynaecological societies of India, Residency Tower, Trivandrum, August 2000.

Dr. Nileena Nayak
Lecturer in Cytopathology

"

CME on Thoracic Cytology, Mangalore, November, 1999.

29th Annual conference of Indian Academy of Cytologists, Mangalore, November, 1999.

Dr. Padmanabhan V.
Professor in Radiation Physics

"

Chaired the Scientific session of AROI Kerala Chapter, Trivandrum, February 2, 2000.

"

International Quality Audit for ISO 9000 training by NIQR, Government Guest House, Trivandrum, 23-24, 1999.

"

AROI Kerala Chapter, Trivandrum, November 27, 1999.

"

ISO 9000-2000 training course, Quality management standards of the future, Management Association, Trivandrum, January 14, 2000.

"

Workshop on Doppler Sonography, SCIMIST, Trivandrum, February 2000.

Dr. S. Parameswaran
Assoc. Prof. in Radiotherapy

"

The Royal Australasian College of Radiologists, New Zealand, October 1999.

"

4th Annual Conference of Breast Cancer Foundation, Bangalore, March, 2000.

Paul Sebastian
Assoc. Professor in
Medical Oncology

Padma Balaram
Prof. of Basic Research

Panelist in a panel discussion on head and neck cancer at the CME organized by association of surgeons of India, Trivandrum, October, 1999.

Satellite conference on Image analysis in material and life sciences, Kalpakkam, Madras, November 9-11, 1999.

"

Invited lecture, Alterations in T cell mediated Signal Transduction in oral cancer-26th Annual Conference and Symposium on Cancer Immunology in the New Millenium, Bombay, January 13-15, 2000.

"

Invited lecture, All India Radio programme on "Advancement in the field of Cancer Research - symposium" January 20, 2000.

"

Invited lecture, Immunology of Oral Cancer. 19th Annual Convention of Indian Association for Cancer Research and Symposium on Cancer Biology, Trichur, January 22, 2000.

"

Lecture on "Apoptosis in Immunology" Dr. Malathy Amma Memorial CME on Apoptosis, Trivandrum, January 27, 2000.

"

12th Kerala Science Congress, Peerumedu, January 27-29, 2000.

"

Radiobiology 2000. International conference on Radiation Biology, Trivandrum, February 17-19, 2000.

"

Indo-German workshop on Radiology, Trivandrum, February 20-22, 2000.

"	19th Annual Convention of Indian Association for Cancer Research and Symposium on Cancer Biology, Immunology of Oral Cancer, Trichur, March 22, 2000.	Anaesthesia (AOSRA), New Delhi, October 29 to November 2, 1999.
Dr. Priya Kumary T Asst. Prof. in Paediatric Oncology	Paediatric Cardiology Pulmonary Meet 99, Trivandrum, April 10, 1999.	Colloquium on Health, Healing and Wholeness in the terminally ill (sponsored by CMAI), Schaefflin Leprosy Research and Training Centre, Karigiri, Tamil Nadu, November 26-29, 1999.
"	Faculty-International Academy of Pathology Indian Division, IAPB workshop & CME, Medical College, Trivandrum, August 12-14, 1999.	CME and 47th Annual Conference of Indian Society of Anaesthesiologists, Cochin, December 26-30, 1999.
"	Asia Pacific Cancer Conference, Chennai, December, 12-15, 1999.	Co-Chaired free paper session on "Assessment" at the 7th National and International conference of Indian Association of Palliative Care, Bangalore, February 17-19, 2000.
"	Paediatric cardiology CME, Trivandrum, January 30, 2000.	National meeting on Morphine availability, Nirman Bhavan, New Delhi, February 24, 2000.
"	Newer Vaccines - symposium, Priyadarshini Planetarium, Trivandrum.	
Dr. Rachel Cherian Koshy Assoc. Prof. of Anaesthesiology	Guest lectures, Palliative medicine CME programme for Health Service Doctors, April 25 and May 6, 1999.	Invited lecture, De novo apoptosis, tumor proliferation, ras gene mutation and tumor response to radiotherapy for cervical cancer. 18th Annual convention of Indian Association for Cancer Research & National Symposium on Molecular Biology of Cancer, New Delhi, 1999.
"	Keynote address and panel members, CME programme "Psychosocial Aspects of Terminal Cancer", Venad Guild of Psychiatrists, Hotel Mascot, Trivandrum, July 18, 1999.	Invited lecture, Genetic variations in Indian populations: implications for tumor response to therapy. Workshop on Indo-German collaboration in Oncology: into the next millennium, Lonavala, 1999.
"	Lecture on "Palliative Care and Pain relief in Cancer", awareness programme for medical officers, Regional Cancer Centre, Trivandrum, August, 20, 1999.	invited lecture, Oncogenes and tumor suppressor genes in breast cancer. CME on breast cancer, Department of Radiotherapy,
"	Guest lecture, "Why and What of Palliative Care" at seminar, South Kerala Medical Mission, Trivandrum, August, 28, 1999.	
"	5th Biennial Congress Asian Oceanic Society of Regional	

Dr. Raghakrishna Pillai M.
Assoc. Professor in Laboratory Medicine & Tumour Biology

Dr. Raghuram K. Nair
Asst. Professor in
Radiation Physics

Mr. Rajasekharan Nair G
Medical Records Officer

Dr. Ramachandran K.
Professor of Imageology

Medical College, Kottayam, May
28, 1999.

Invited lecture, Immune response
human papillomavirus and prospects
for vaccine development. 6th Annual
Ranbaxy Science Foundation
Symposium, National Institute of
Immunology, New Delhi, India 1999.

Invited lecture, Clinical significance
of programmed cell death in breast
cancer. 19th Annual convention of
Indian Association for Cancer
Research & Symposium on Cancer
Biology, Amala Cancer Hospital
and Research Centre, Thrissur,
India 2000.

Invited lecture, The patho-physiology
of programmed cell death. CME on
Apoptosis, Association of Pharmacologists
and Physiologists of India,
Medical College Hospital, Thiruvananthapuram, India 2000.

CME-SAQ, Regional Cancer Centre,
Trivandrum, October 9-11, 1999.

KAMP meeting, Medical College,
Thrissur, January 2, 2000.

Board of studies in Radiation
Technology, University of Calicut,
Calicut, January, 2000.

National Conference on Medical
Records Management, Meenakshi
Mission Hospital, Madurai.

Imaging update 99. CME
programme in Radiology,
Department of Radiodiagnosis,
Medical College, Kottayam,
Radiology club of Kottayam and
IRIA Kerala State Branch, 1999.

Dr. Ramadas K
Asst. Prof. in Radiotherapy

Dr. Ramani S Wesley
Asst. Prof. in Community
Oncology

Dr. Ratheesan K.
Asst. Prof. in Radiotherapy

Dr. Ravindran Ankathil
Asst. Prof. in Basic Research

Vision 99, CME programme in
Radiology, Department of
Radiodiagnosis, Medical College
Calicut, Calicut Radiology Club and
IRIA Kerala State Branch, May 1-2,
1999.

6th International Congress on Oral
Cancer, New Delhi, April 15-18,
1999.

Panel discussion member on
"Colposcopy" in Preventive Oncology,
workshop organized by Indian
Academy of Human Reproduction,
Cochin, July 16, 1999.

Invited speaker, Colposcopy, low
cost cancer detection methodologies
for Doctors, Gynaecologists, Health
workers and nurses, organized by
IARC, Community Health Centre,
Ambilikkai, 1999.

Guest lecture and practical training,
Colposcopy, Cryotherapy, Loop
Electro Surgical Excision for
Doctors, Gynaecologists and
Nurses. International School of
Colposcopy, Barshi, organized by
IARC and Cancer centre Barshi,
Maharashtra, February, 2000.

Investigators meet on peg
interferon in metastatic renal cell
carcinoma, Spain.

CME on Medical Laboratory
Technology, School of Medical
Education, Gandhi Nagar, Kottayam,
June 22, 1999.

British society of Human Genetics
Conference, University of York, UK,
September 27-29, 1999.

"	Research Away Day Seminar, St. Mary's Hospital, Manchester, UK, November 3, 1999.	"	Association of Plastic surgeons, Kerala Chapter, April, 2000.
"	Research and Development Seminar Postgraduate and Health Sciences Centre, Royal Infirmary, Manchester, UK, November 10-11, 1999.	"	International workshop on pain, Regional Cancer Centre, Trivandrum.
"	12th Kerala Science Congress, Peermedu, Idukki District, January 27-29, 2000.	Ms. Shamla Beevi Staff Nurse	CME programme-professionalism A change to nurses, College of Nursing, Trivnadrum, November 17-18, 1999.
Dr. K. Ravindran Pillai Asst. Prof. in Cytopathology	National seminar on recent trends in microbiology UGC and Association of Microbiology, Sree Sankaran College, Kalady, March, 1999.	Ms. Sindhu S Staff Nurse	Update on quality care for nurse managers, College of Nursing, Trivandrum, April 29-30, 1999.
"	15th Asia Pacific Cancer Conference (APCC), Chennai, December, 1999.	Ms. Soney B Staff Nurse	Workshop on human relations in nursing, College of Nursing, Trivandrum, June 8-18, 1999.
Dr. Remani P Asst. Prof. of Research	Seminar on Indigenous approach to Treatment of Cancer, Trivandrum, May 27, 1999.	Dr. Sreedevi Amma N. Med. Director & Professor	Invited lecture, current concept in CIN of cervix and as a faculty member in the pannel discussion, workshop on preventive oncology, Indian Academy of Human reproduction, July, 1999.
"	5th International Congress of Ethno pharmacology, Lucknow, November 17-21, 1999.	"	Organised and attended CME Programme on pre-analytical variables during blood collection, July, 1999.
"	12th Kerala Science Congress, Peerumedu, January 27-29, 2000.	"	29th Annual conference of Indian Academy of Cytologists, Mangalore, November, 1999.
"	Radiobiology 2000. International conference on Radiation Biology, Trivandrum, February 17-19, 2000.	"	15th Asia Pacific Cancer Conference, Madras, December, 1999.
Ms. Saraswathy Amma E Head Nurse	Workshop on update on management technique for Head Nurses and Nursing Superintendents of Kerala, College of Nursing, Trivnadrum, May 19-28, 1999.	Dr. Sreejith Nair Asst. Prof. in Medical Oncology	Asia Pacific Cancer Conference, 1999.
Dr. Shaji Thomas Asst. Prof. In Surgical Oncology	National conference of association of Plastic Surgeons of India, APSICON 99, Goa, September, 1999.	"	Oncology update, Agra, August 2000.
		Mr. Sreekumar B Coding Clerk	National Conference on Medical Records Management, Meenakshi Mission Hospital, Madurai.

Ms. Sreelekha R
Clinical Instructor

Mr. K. Sujathari
Cytotechnologist

Mr. B. Saju
Lecturer in Radiation Physics

Dr. Tara Somanathan
Lecturer in Cytopathology

Mr. Tayal Singh Elias
Asst. Prof. in Radiation Physics

Dr. Venugopal
Lecturer in Anaesthesiology

State level workshop on Cardiac
and Neuro nursing; SCTIMST,
Trivandrum, September, 1999.

9th Swadesi Science Congress
Kollam, November, 1999.

Workshop on brachytherapy -
Contribution towards cancer
M.S. Oswal Cancer Institute,
Ludhiana, March 31 to April 1, 2000.

15th Asia Pacific Cancer Conference
Chennai, December, 1999.

Workshop and CME on Paediatric
and Perinatal pathology, Medical
College, Trivandrum, August, 1999.

Recent trends in the management
of brain tumour, SCTIMST,
Trivandrum, September, 1999.

Participated in the International
course on Epidemiology -
Principles and methods, Organised
by IARC, Thailand, November,
1999.

AROI meeting, Medical College,
Calicut, March 14, 1999.

7th National and International
conference of IAPC,
Bangalore, February 17-19, 2000.

PAPERS PRESENTED IN CONFERENCES, SEMINARS, WORKSHOPS ETC.

Aleyamma Mathew. Removing bias in cancer survival estimates
due to loss to follow-up. 17th Annual conference of Indian Society
for medical statistics, Bangalore, India, 1999.

Aleyamma Mathew. Treatment outcome in young patients (age
< 35 years) with early stage breast cancer. 15th Asia Pacific
cancer conference, Madras, 1999.

Anitha Mathews. Squamous cell carcinoma arising in
cystosarcoma phyllodes breast, 29th Annual conference of Indian
Academy of Cytologists, Mangalore, November, 1999.

Bindu L, Bhattathiri VN, Aleyamma Mathew, Krishnan Nair M.
Evolution of Radiation induced Nuclear and Cytoplasmic
Changes in Oral Carcinoma Cells. 12th Kerala Science Congress,
Peerumedu, January 27-29, 1999.

Bindu L, Bhattathiri VN, Aleyamma Mathew, Krishnan Nair M.
19th Annual convention of Indian Association for Cancer
Research and symposium on Cancer Biology, January 21-23,
2000 at Amala Cancer Hospital and Research Centre. Radiation
effect on oral carcinoma cells and its dose dependent relation.

Chacko P, Preethi TR, Radhakrishna Pillai M. Apoptosis in ovarian
tumors. 19th Annual convention of Indian Association for Cancer
Research & Symposium on Cancer Biology, Amala Cancer
Hospital and Research Centre, Thrissur, India, 2000.

Chandrakumaran Nair M. 'Information needs and use pattern of
oncologists: The impact of modern information technologies'.
National Convention of Medical Library Association of India, Navi
Mumbai, 1999.

Chandralekha B. Three interesting cytology cases, participated
as faculty member, CME in 29th Annual conference of Indian
Academy of Cytologists, Mangalore, November, 1999.

Cherlan Koshy. Salvage surgery in head and neck cancer.
International conference of pain and palliative care, Bangalore,
India, February 2000.

Cherian Varghese. Prevalence of inflammation and HPV infection
in the genital tract in a general population in Kerala, India. Global

- Challenge of Cervical Cancer Prevention: EUROGIN-2000, Paris April 5-9, 2000.
11. Davis CA. Shielding in Radiotherapy, Lecture notes, SAQ-CME 54-61, Regional Cancer Centre, Trivandrum, October 9-11, 1999.
 12. Elizabeth K Abraham. Hormone receptor status and clinical pathological profile of breast carcinoma cases - Regional Cancer Centre, Trivandrum experience, 15th Asia Pacific Cancer Conference, Madras, December, 1999.
 13. Elizabeth Mathew Iype. Survival and predictors of survival in young patients with oral cancer. Asia Pacific Cancer conference Chennai, December, 1999.
 14. Elizabeth Mathew Iype. Prevention of the Marginal Mandibular Nerve in head and neck cancer surgery in the plastic surgery session. 52nd Annual conference of the association of otolaryngologists of India. Cochin, January 2000.
 15. Elizabeth Mathew Iype. Giant cell tumour of the hyoid bone - A case report in the State annual conference of the AOI. Cochin, May 2000.
 16. Firoz R. Panel discussion on lymphomas, ASI conference, Kerala Chapter, Kozhikode, February 2000.
 17. Gangadharan P, Krishnan Nair M, Jayalekshmi P, Raghu Ram K Nair. Low level chronic radiation and cancer occurrence - XV Asia Pacific Cancer Conference, Chennai, December, 12-15, 1999.
 18. Gangadharan P. Epidemiology of breast cancer. International conference on breast cancer, Nagpur, 1999.
 19. Gangadharan VP. Management of acute leukaemia - CME, Amala Cancer Hospital, Trichur.
 20. Gangadharan VP. Cancer drug update - Newer pyrimidines, KMIO, Bangalore.
 21. Gangadharan VP. Recent advances in the management of ovarian tumours - CME, Dept. of OBG, Trissur.
 22. Gangadharan VP. Neuro Oncological aspects of Dementia - Society for rehabilitation of cognition and communication disorders, Trivandrum.
 23. Gangadharan VP. Advances in the management of germ cell tumours of the ovary. Indian academy of human reproduction, Cochin.
 - Gangadharan VP. Stress and cancer, CME association of physiologists and pharmacologists, Trivandrum.
 - Gangadharan VP. Management of malignant bone tumour, CME, Association of orthopaedic surgeons, Trivandrum.
 - Gangadharan VP. Management of hepatocellular carcinoma, Gut club, Cochin.
 - Gangadharan VP. Post transplant malignancies, Uroclub, Cochin.
 - Gigi Thomas, Premalatha BS, Manoj Pandey, Pradeep VM. Oral soft tissue metastasis from thyroid cancer. J Oral Maxillofacial Surg, 2000.
 - Jayalekshmi P, Krishnan Nair M, Sreedevi Amma N, Gangadharan P, Mani K.S, Cherian Varghese and Jayadevan S. Cancer in Women in Rural Kerala. - XV Asia Pacific Cancer Conference, Chennai, December, 12-15, 1999.
 - Jayasree K. Diagnostic accuracy of cytology in anaplastic large cell lymphomas. in 29th Annual conference of Indian Academy of Cytologists, Mangalore, November, 1999.
 - Joseph T, Srinivas G, Radhakrishna Pillai M. Apoptosis induction and role of solanum extracts in cultured cells. 19th Annual convention of Indian Association for Cancer Research & Symposium on Cancer Biology, Amala Cancer Hospital and Research Centre, Thrissur, India, 2000.
 - Latha P.T. "Social life of post cervical cancer patients", IAPC conference, Bangalore, February, 2000.
 - Kannan S, Elizabeth K Abraham, Bhattathiri VN, Nalinakumari KR, Krishnan Nair M. Relationship of vascular endothelial growth factor (VEGF) with early recurrence in oral squamous cell carcinoma. 15th Asia Pacific Cancer Conference, Madras, 1999.
 - Kannan S, Jayasurya R, Lakshminarayanan K, Nalinakumari KR, Elizabeth K Abraham, Krishnan Nair M. Cyclin D1 is an independent prognostic marker in oral carcinomas. 19th Annual Convention of Indian Association for Cancer Research and Symposium on Cancer Biology, Trichur, 2000.
 - Kumari Thankom "Symptom Distress, are we measuring it?" 7th International conference of IAPC, Bangalore, February 17-19, 2000.
 - Mani K.S., Sreedevi Amma N, Jayalekshmi P, Gangadharan P. Cancer Control - A Cytologic Approach. 9th Swadeshi Science Congress Kollam, November, 1999.

37. Manjula R. Experiences from palliative care at RCC, Trivandrum Palliative Training Programme, RCC, Patna, November, 1999.
38. Manoj Pandey, Aleyamma Mathew, Elizabeth Mathew Iype, Latha PT, Paul Sebastian, Chaturvedi S.K, Krishnan Nair M, Ramad K. Quality of life in patients with oral cancer. Preliminary results of Trivandrum Quality of Life Study (TOOLS), NATCON IASO Dehradun, October 8-10, 1999.
39. Manoj Pandey and TOCS study group, Results of surgical excision or oral premalignant lesions. APCC Chennai, December 12-15, 1999.
40. Manoj Pandey, Gigi Thomas, Iype IM, Elizabeth K. Abraham, Tara Somanathan, Chaturvedi SK, Krishnan Nair M. Soft tissue sarcoma of the head and neck region in adults IASO section ASICON 99, Madurai, December 26-30, 1999.
41. Nileena Nayak. Role of cytology in diagnosis and management of leukemias, in 29th Annual conference of Indian Academy of Cytologists, Mangalore, November, 1999.
42. Padmanabhan V. Invited talk, Historical perspective of radiotherapy, CME-SAQ, Regional Cancer Centre, Trivandrum October 9, 1999.
43. Padmanabhan V. Invited talk, Dose measurements in diagnostic radiology. 5th Dr. T.P. Ramachandran Memorial oration in 10th State annual meeting of KAMP, Medical College, Thrissur, January 2, 2000.
44. Padmanabhan V. Invited talk, Brachytherapy- A review Symposium on Medical Radiation Dosimetry and protection AMPI, Karnataka Chapter, KMC Manipal, May 8-9, 2000.
45. Priya Kumary T. Management of renal tumours of childhood. International academy of pathology Indian division workshop and CME, Medical College, Trivandrum, August, 1999.
46. Priya Kumary T. A clinico-pathological study and survival analysis of rhabdomyosarcoma in children - poster presentation, APCC Chennai, December, 1999.
47. Rachel Cherian Koshy. "Sphenopalatine Ganglion Neurolytic Block in the management of Intractable pain due to head and neck malignancies", 5th Biennial Congress Asian Oceanic Society of Regional Anaesthesia (AOSRA), New Delhi, October 29 to November 2, 1999.

Rachel Cherian Koshy. "Training in CPR: Need of the Hour", 47th Annual conference of Indian society of anaesthesiologists, Cochin, December 26-30, 1999.

Rachel Cherian Koshy. "Nerve blocks in gynaecological malignancies - in palliative care" - Institution and beyond IAPC, Bangalore, 2000; 48-54.

Radhakrishnan R, Radhakrishna Pillai M, Krishnan Nair M. The cell biology of treatment response in non-Hodgkin's lymphoma. 19th Annual convention of Indian Association for Cancer Research & Symposium on Cancer Biology, Amala Cancer Hospital and Research Centre, Thrissur, India 2000.

Radhakrishna Pillai M. Cellular manifestations of tumor progression in the oral mucosa: role of human papillomavirus, apoptosis, angiogenesis, proliferation and tumor associated genes p53, bcl-2 and bax. 6th International Congress on Oral Cancer, New Delhi. 1999.

Radhakrishna Pillai M, Krishnan Nair M. Human papillomavirus infection and epithelial carcinogenesis: development of a condemned mucosa syndrome. XV Asia pacific cancer conference, Cancer Institute (WIA), Chennai, India 1999.

Raghu Kumar. External beam therapy, Lecture notes, SAQ-CME 54-61, October 9-11, 1999.

Raghu Ram K Nair. Radiotherapy Simulator - the indispensable mimic - SAQ-CME 54-61, Regional Cancer Centre, Trivandrum, October 9-11, 1999.

Raghu Ram K Nair. Quality Control and acceptance tests of radiotherapy simulator - State annual meeting of KAPM, Medical College, Thrissur, January 2, 2000.

Ramachandran K. Imageology-evolving trends, CME conducted by IMA Chirayinkil branch on the occasion of the inauguration of the Chirayinkil; branch of IMA academy of medical specialities, Trivandrum, April 11, 1999.

Ramachandran K. Ultrasound and Radionuclide Imaging - CME on Imageology and treatment of oral cancer for dental house surgeons, Regional Cancer Centre, Trivandrum, July 4, 1999.

Ramachandran K. Mammography - CME conducted by Indian Academy of Human Reproduction, Cochin, July 16-18, 1999.

59. Ramachandran K. Mammography - Training programme for Medical Officers on awareness and early detection of cancer. DGHS and WHO Biennium 1998-99, Regional Cancer Centre, Trivandrum, August 19-20, 1999.
60. Ramachandran K. Imaging in breast cancer - South India regional and 5th State conference of Indian Medical Association, Academy of Medical Specialities and inauguration of Cochin Chapter, Cochin, August 29, 1999.
61. Ramachandran K. Skeletal survey, its relevance - Radiographers Orientation Programme, Kodak India Ltd. (Health imaging division), PTC Tower, Trivandrum, November 14, 1999.
62. Ramachandran K. Metastasis of unknown origin (MUO) neck. Role of imaging for primary. Panel member in the scientific session of ASICON 99, Association of surgeons of India, 59th annual conference, Madurai, December 26-30, 1999.
63. Ramachandran K. CT abdomen on COIM - 2000. CME in Radiology, Medical College, Alleppey, Kerala, 2000.
64. Ramachandran K. Small parts (Scrotum, eye, thyroid, breast) Training workshop for the trainers in Ultra Sound Scanning, DHS W&CH Hospital, Thycad, Trivandrum, January 13-15, 2000.
65. Ramachandran K. CT Abdomen - Faculty in the Imaging update 2000. Department of Radiodiagnosis, Medical College, Trichur, Kerala, March 26, 2000.
66. Ramani S Wesley. "Visual inspection with vinegar as a screening strategy in cervical cancer detection", Guest lecture for Gynaecologists and Colposcopists, Hamilton Regional Cancer Centre, Canada, June, 1999.
67. Ramani S Wesley. Colposcopy and Kerala experience of downstaging of cervical cancer, Guest lecture for Interns of Mc Master University and Colposcopists, St. Joseph's Hospital, Canada, May, 1999.
68. Ramani S Wesley. Invited speaker, "Preventive oncology in cervical cancer - Newer concepts". Preventive Oncology workshop by Indian Academy of Human Reproduction, Cochin, July 17, 1999.
69. Raveendran Pillai K. Oral cancer: its magnitude and management issues, National seminar on recent trends in microbiology, Sree Sankara College, Kalady, March 1999.
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Sir Rattan Tata Trust, Bombay.
Dr. S.R. Uttarwar, Director, Software Technology Park, Trivandrum.
Institute for Cancer Research, Sutton, UK.
University of Leeds, UK, Kay Kendall Leukaemia Research Fund, UK.
Prof. J. Peto, Institute of Cancer Research, Sutton, UK.
Dr. T Sugahara, Japanese Research Foundation

**REGIONAL
CANCER
CENTRE**

THIRUVANANTHAPURAM

ACCOUNTS

1999-2000

**REGIONAL CANCER CENTRE
(REG. No.
BALANCE SHEET AS ON**

PREVIOUS YEAR		SCHE- DULE	LIABILITIES	CURRENT YEAR	
Rs.	Ps.			RS.	PS.
33176093238		I	CAPITAL FUND	35760685729	
191751090		II	SPECIFIC FUNDS	203929212	
2102319600			UNUTILIZED GRANTS	2455131500	
157122995			STAFF WELFARE FUND	138565795	
382689650			RAD. THERAPY RESEARCH FUND	NIL	
341913910			CCL FUND	3739697610	
431051301		III	ADV. RECEIVED FOR RESEARCH PROJECT	62716025	
1683952920		IV	SECURED LOANS	2135771349	
			CURRENT LIABILITIES AND PROVISIONS		
1583748624		V	CURRENT LIABILITIES - OTHERS	1561371917	
		VI	CREDITORS FOR GOODS SUPPLIED	1880849385	
12325860553		VII	PROVISION FOR DEPRECIATION	14137762953	
56326199167		TOTAL		62076481475	

Place: Trivandrum
Dated: 09.02.2001

Sd/-
DIRECTOR
DR. M. KRISHNAN NAIR

**SOCIETY, TRIVANDRUM
567/81)
31ST MARCH 2001**

PREVIOUS YEAR		SCHE- DULE	LIABILITIES	CURRENT YEAR	
Rs.	Ps.			RS.	PS.
29417425036		VII	FIXED ASSETS	31128137256	
1046547006		VIII	CAPITAL WORK-IN-PROGRESS	1046547006	
3401726700		IX	INVESTMENTS	4534481900	
			CURRENT ASSETS AND LOANS AND ADVANCES		
281471497		X	CLOSING STOCK	498765692	
151522500			INTEREST ON DEPOSITS	187858000	
322201570		XI	ADVANCES TO PROJECTS	345781552	
506071897		XII	ADVANCES - OTHERS	976946372	
673361000		XIII	INVESTIGATION FEES RECEIVABLE	556560200	
36205900			SECURITY DEPOSITS	36205900	
647446584		XIV	BALANCE WITH BANKS	88430582	
6813881		XV	CASH IN HAND	11142591	
816500000			GRANT IN TRANSIT	850000000	
18718905596		XVI	INCOME AND EXPEND. A/C	21815544424	
563261991,67		TOTAL		620764814,75	

Vide my Report of Even Date

Sd/-
**T. AJITH KUMAR B.Com, ACA
CHARTERED ACCOUNTANT
MEMBERSHIP NO. 209348**

**REGIONAL CANCER CENTRE
(REG. NO
INCOME AND EXPENDITURE ACCOUNT**

PREVIOUS YEAR		SCHEDULE	LIABILITIES	CURRENT YEAR	
RS.	PS			RS.	PS.
3,445,605.00		A.	Opening Stock	2,814,714.87	
28,969,879.05		A.	Purchases	39,375,890.24	
41,291,623.61		B.	Salaries & Allowances	57,192,933.88	
314,438.50			Uniform and Liveries	275,793.00	
329,582.00		C.	Rent, Rates & Taxes	274,597.00	
866,017.43		D.	Postage, Telephone & Telegram	941,352.85	
522,852.00		E.	Travelling Expenses	738,569.40	
680,358.25		F.	Printing & Stationary	584,090.85	
19,349.50			Advertisement	55,038.00	
3,572,823.00		G.	Electricity / Water charges	5,534,751.80	
80,000.00			Remuneration to Auditors	68,830.00	
3,371,757.37		H.	Repairs and Maintenance	4,093,806.21	
1,137,041.00		I.	Service contract charges	1,097,264.00	
2,736,442.07			Interest and Bank charges	2,488,438.62	
32,554.00			Training Expenses	3,000.00	
170,298.00			Conference / Seminar/ Workshop	121,087.50	
228,890.00		J.	Computer expenses	162,593.00	
3,167.50			Books and periodicals	7,018.00	
49,185.40			Landscaping and Gardening	45,422.00	
948,682.00			Proportionate share to NTR	1,184,487.00	
72,460.25		K.	Miscellaneous expenses	163,540.00	
2,800.00			Software	0.00	
17,772,834.00			Depreciation	18,205,068.00	
1,78,642.75			Cancer education programme	10,545.00	
104,777,280.68		Total		135,458,839.12	

Notes Forming Part of Accounts

Place: Trivandrum
Dated: 02.09.2001

Sd/-
DIRECTOR
DR. M. KRISHNAN NAIR

**SOCIETY, TRIVANDRUM
667/81)
FOR THE YEAR ENDED 31st MARCH 2000**

PREVIOUS YEAR		SCHEDULE	LIABILITIES	CURRENT YEAR	
RS.	PS			RS.	PS.
11,036,000.00		L.	Grant-in-aid Govt. of Kerala	33,691,000.00	
1,135,525.00			Grant-in-aid Govt. of India	0.00	
38,111,793.00			Investigation fees	47,260,174.36	
0.00			T.O. Ward charges	7,979.00	
12,820,087.20			Sale of Medicines	17,042,328.29	
674,092.00			Interest income	38,188.00	
1,386.00			Clinical Service Charges	300.00	
118,300.00		M.	Training fees	156,007.00	
54,601.00			Income from projects	600.00	
17,687.00			Donation	1,000.00	
147,312.00		N.	Miscellaneous Income	627,101.35	
281,474.97			Closing stock	4,987,656.92	
37,845,802.51			Excess of expenditure over income	31,646,504.20	
1,04,777,280.68		Total		1,35,458,839.12	

Vide my Report of even date

Sd/-
T. AJITH KUMAR B.Com, ACA
CHARTERED ACCOUNTANTS
MEMBERSHIP NO. 209348

**REGIONAL CANCER CENTRE
(REG. NO
CANCER CARE
INCOME AND EXPENDITURE ACCOUNT**

PREVIOUS YEAR		LIABILITIES	CURRENT YEAR
RS.	PS		RS. PS.
75,000,00		Salaries & Allowances	84,000,00
47,050,00		Advt. And Publicity	50,500,00
2,550,00		Printing & Stationary	0,00
50,000,00		Postage/Telephone/Telegram	0,00
62,677,59		Fuel Charge	53,380,00
8,165,00		Maintenance	1,375,00
8,465,00		Spare parts	15,049,00
1,342,859,00		Reimbursement to patients	2,553,614,00
10,860,00		Miscellaneous Expenses	5,484,00
13,205,00		Commn. to Federal Bank	0,00
9,916,00		Insurance	8,050,00
2,129,143,99		Excess of Inc. over expenditure	680,115,92
3,757,891,58		Total	3,451,567,92

Place: Trivandrum
Dated: 02.09.2001

Sd/-
DIRECTOR
DR. M. KRISHNAN NAIR

**SOCIETY, TRIVANDRUM
567/81)
LIFE FOR SCHEME
FOR THE YEAR ENDED 31st March 2000**

PREVIOUS YEAR		LIABILITIES	CURRENT YEAR
RS.	PS		RS. PS.
3,757,891,58		Interest on F.D. and investment	3,451,567,92
3,757,891,58		Total	3,451,567,92

Sd/-
T. AJITH KUMAR B.COM,ACA
CHARTERED ACCOUNTANT
MEMBERSHIP NO. 209348

REGIONAL CANCER CENTRE
(REGD. NO.

SCHEDULE OF FIXED

ITEM	GROSS BLOCK			
	Cost on			Cost on
	01.04.88	Additions	Deduction	31.03.2000
Rs. Ps.	Rs. Ps.	Rs. Ps.	Rs. Ps.	
BUILDINGS. OLD	880,110.25			880110.25
BUILDINGS:	28237058.08	351086.00		28588144.08
BUILDINGS - RT	17084500.70			17084500.70
BUILDING PHASE II	79185665.99	189348.00		79375013.99
BOUNDARY WALL	127118.83			127118.83
WATERSUPPLY AND DRAINAGE	1944716.43	84389.00		2029105.43
FURNITURE AND FITTINGS	7771306.43	79745.00		7851051.43
OFFICE EQUIPMENT	1849938.43	195072.00		1845008.43
HOSPITAL AND LAB EQUIPMENTS	77803353.67	14433017.80		92236371.47
ELECTRICAL INSTALLATION	35918284.90	1081780.00		36999064.90
FIRE DEFECTION	3841120.00			3841120.00
AIR CONDITIONING	15739104.35			15739104.35
COMPUTER HARDWARE & SOFTWARE	2508171.00	288500.00		2796671.00
GAS AND CYLINDER	8423308.85	140042.40		8563351.25
VEHICLES	378329.80	191534.00	80293.00	489570.80
LIBRARY BOOKS AND JOURNALS	5638182.27	161776.80		5800000.27
LIFT AND ELEVATOR	5813240.00			5813240.00
ASSETS DONATIONS:	337812.00			337812.00
TELEPHONE EQUIPMENTS	2845220.00	12105.00		2857325.00
TOTAL	294174250.36	17117415.28	80238.00	311281372.56

SOCIETY, TRIVANDRUM
567/81)

ASSETS AS ON 31.03.2000

ITEM	NET BLOCK				
	UPTO	ADDITIONS	TOTAL UPTO	AS ON	
	31.3.89		31.3.2000	31.3.2000	
Rs. Ps.	Rs. Ps.	Rs. Ps.	Rs. Ps.	Rs. Ps.	
	419802.95	22015.00	441817.95	418282.30	440307.30
	10486187.84	907599.00	11403786.84	17244387.42	17800880.42
	4427884.68	633330.00	5061224.68	12033278.01	12666608.01
	11293841.80	3404053.00	14697894.80	61677019.99	67891724.99
	54813.08	3615.00	58428.08	68689.75	72304.75
	1235878.83	118970.00	1354848.83	674168.80	708738.80
	3311524.36	453852.00	3765376.36	4085575.07	4459782.07
	930008.66	135750.00	1065758.66	782251.87	718828.87
	48491783.86	6561687.00	55053480.86	37182891.41	29311560.81
	17761827.65	2886935.00	20638762.65	16358302.25	18164457.25
	1750478.10	313588.90	2064075.10	1777044.90	2090640.80
	10128390.40	841607.00	10969997.40	4789108.96	5810713.96
	2212888.80	232720.00	2445608.80	348082.20	203302.20
	2914283.65	548710.80	3462993.65	3109358.40	3530026.00
	250460.66	48022.00	298482.66	184088.04	38576.04
	2778642.25	436698.00	3215340.25	2474828.02	2759550.02
	3127287.35	417800.00	3545137.35	2368102.65	2786002.65
	216710.80	18185.00	234895.80	102766.70	120901.70
	1378842.70	221772.00	1600614.70	1258710.30	1466877.80
TOTAL	123172563.53	18205086.00	141377629.53	189903743.03	17091193.03

AJITHKUMAR T. B.com, ACA
CHARTERED ACCOUNTANT

T.C. 6/1012
Konathukulangara,
Vattiyookavu P.O.
Trivandrum - 695 013
Telephone : 362159, 926-45045
E-mail: ajithtchartered@rediff.com

AUDITORS' REPORT

I have examined the attached Balance Sheet of the REGIONAL CANCER CENTRE SOCIETY, Regn. No. 567/81, Thiruvananthapuram as at 31st March, 2000 and the Income and Expenditure Account for the year ended on that date annexed thereto and report that:

1. The said Balance Sheet, Income and Expenditure account and the schedules thereon are in agreement with books of accounts maintained by the Society.
2. I have obtained all the information and explanation which to the best of my knowledge and belief were necessary for the purpose of my audit.
3. In my opinion, proper books of accounts have been maintained by the Society.
4. In my opinion and to the best of my information and according to the explanation given to me and subject to the following:
 - I. Internal control in respect of fixed assets, Stores and Engineering items are not commensurate with the size and magnitude of activities of the Society.
 - II. Allocation of grant of Rs.346.91 Lakhs received from Government of Kerala between Capital and Revenue at Rs. 10 Lakhs and Rs. 336.91 Lakhs respectively as referred to in Note.No-1.
 - III. The land assigned by the State Government Vide GO/619/88/RD. dated. 28.7.1988, measuring 69 cents at Palghat and the building constructed there on for which the Patta has not been received as referred to In Note-No.4
 - IV. Land at Pulayanarkotta measuring 17 acres in Sy.No.2122 1054/22/RD. dated 17.11.1982 has not been brought to the

accounts for want of clear documents of Title as referred to in Note No.5

- V. Cancer care for life "SBT Staff SB A/C No.400328" is subject to reconciliation and confirmation and there is a reconciliation difference of Rs.57618/- as on 31.3.2000 between the Bankbook balance and PassBook balance as referred to in Note No.7.
- VI. During the financial year 1999-2000, all the projects which were dealt in the accounts of RCC Society till 31.3.99 has been separated and a separate project cell set up exclusively for handling the various projects as referred to in Note.No.8.
- VII. Capital WIP for an amount of Rs.10465470.06/- as on 31.3.2000 is the balance in the account brought forward from last year and carried as such as the same is pending proper adjustments in the accounts since the finalisation of the contractor's bill has not been completed as referred to in Note No.9.
- VIII. The investment and term deposit suspense account a mode against CCL fund account has not been reconciled as on 31.3.2000 as referred to in Note No.2 and;
 - i. The Balance Sheet read together with Notes thereon gives a true and fair view of the state of affairs of the Society as at 31st March, 2000 and ;
 - ii. The Income and Expenditure Account read together with Notes thereon give a true and fair view of the deficit of the Society for the year ended 31st March, 2000.

Sd/-

T. AJITHKUMAR, B.Com, ACA
CHARTERED ACCOUNTANT
Mem No. 209348

Place : Thiruvananthapuram.
Date : 09/02/2001

SCHEDULE

NOTES FORMING PART OF ACCOUNTS

1. Out of the grant received from Government of Kerala during the financial year 1999-2000 amounting to Rs.346.91 Lakhs, an amount of Rs.10 Lakhs have been transferred to Capital Fund representing Fixed Assets acquired or constructed during the year and the balance of Rs.336.91 Lakhs have been treated as Revenue and taken to Income and Expenditure Account.
2. The investment against Cancer Care for Life Fund Account has not been reconciled as on 31.3.2000.
3. An amount of Rs.3,50,000/- representing unidentified credit in the account with State Bank of Travancore brought forward from previous year, has been taken in to account by crediting Bank Suspense Account.
4. The land assigned by the State Government vide GO/619/88/ RD. dated. 28.7.1988 measuring 69 cents at Palghat and the building constructed there, has not been brought to the accounts, since clear documents of Title has not been received.
5. The Land at Pulayanarkotta measuring 17 acres assigned by the Government of Kerala vide order No.GO(MS)No.1054/22/ RD. dated: 17.11.1982 has not been brought to accounts, since the clear document of Title has not been received.
6. Claim made by the Executive Engineer, Special Building, PWD amounting to Rs.3,45,615/- deposit works, carried out for RCC, has not been acknowledged as debt and hence not provided for in the accounts.
7. Cancer care for life "SBT Staff SB A/C No.400328" is subject to reconciliation and confirmation and there is a reconciliation difference of Rs.57618/- as on 31.3.2000 between the Bankbook balance and PassBook balance.
8. During the financial year 1999-2000, all the projects which were dealt in the accounts of RCC Society till 31.3.99 has been separated and a separate project cell set up exclusively for handling the various projects.
9. Capital WIP for an amount of Rs.10465470.06/- as on 31.3.2000 is the balance in the account brought forward from last year

and carried as such as the same is pending proper adjustments in the accounts since the finalisation of the contractor's bill has not been completed.

10. Stationery is accounted on cash basis and no stock in hand is taken in the account as on 31st March , 2000.
11. The balance in party accounts are subject to confirmation.
12. During the year the accumulated depreciation to the extent of Rs.86042/- has been deducted from the depreciation fund on account of the sale of a vehicle and the profit arising out of sale for Rs.36365/- has been shown under Miscellaneous Receipts in the Income and Expenditure Account.
13. Previous year figures have been re-grouped and re-cast wherever necessary to suit the current year's layout.

Vide my Report of even date.

Sd/-

Place : Thiruvananthapuram
Date : 09.02.2001

T.AJITH KUMAR B.Com,ACA
CHARTERED ACCOUNTANT
Mem.No.209348.

Sd/-

Dr.M.KRISHNAN NAIR
DIRECTOR

SIGNIFICANT ACCOUNTING POLICIES

1. The Financial Statements are prepared on historic cost convention method.
2. Fixed Assets are accounted at cost; depreciation is provided at the rates as evaluated by the management and on written down value method. Full depreciation for the year is provided at in respect of additions.
3. Chemicals, medicines and consumable stores are valued at cost.
4. Grant from Governments are accounted, based on the sanction received.
5. Contributions in foreign currency are accounted on realisation basis.
6. Provident Fund is regularly contributed to the Employees Provident Fund and is deposited with Regional Employees Provident Fund Commissioner, Contributions towards gratuity is made through Group Gratuity Scheme of Life Insurance Corporation.

Vide my Report of even date.

Sd/-

Place : Trivandrum
Date : 09/02/2001

T.AJITH KUMAR B.Com,ACA
CHARTERED ACCOUNTANT
Mem.No.209348

Sd/-

Dr. M.KRISHNAN NAIR
DIRECTOR

UTILISATION CERTIFICATE

Certified that the grant of Rs.3,46,91,000/- (Rupees Three Crores Forty-six Lakhs Ninety One Thousand only) received during the financial year 1999-2000 by the REGIONAL CANCER CENTRE SOCIETY, THIRUVANANTHAPURAM (Registration No. 567/81) from the Health and Family Welfare Department, Government of Kerala as per the Government Orders;

			<i>Rs. in Lakhs</i>
G.O.(Rt)	1490/99	26.05.1999	70.00
G.O.(Rt)	2327/99	16.08.1999	70.00
G.O.(Rt)	2877/99	23.10.1999	80.00
G.O.(Rt)	3467/99	21.12.1999	126.91
Total			346.91

have been utilised by the Society during the financial year 1999-2000 for the purpose of overall development and maintenance of the institution and other working expenses, implementation of projects, construction of building, functioning of Early Cancer Detection Centre and National Tumour Registry.

Sd/-

T.AJITH KUMAR B.Com, ACA
CHARTERED ACCOUNTANT
Mem. No. 209348

Place : Thiruvananthapuram

Date : 09/02/2001