



**REGIONAL
CANCER
CENTRE**

TRIVANDRUM

1990 - '91



REGIONAL CANCER CENTRE
TRIVANDRUM-695 011, KERALA, INDIA

REPORT OF ACTIVITIES 1990-91

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INTRODUCTION

The Regional Cancer Centre, Trivandrum, was started in 1981 to offer comprehensive cancer care to patients and to function as the apex organisation for cancer control in the State. 1991 marks a decade of its existence and it gives us an opportunity to take stock of what we have already achieved and how far the institution has succeeded in fulfilling its objectives.

During the initial stages the number of new patients was hardly 3000 per annum. Presently it has risen upto 6000 per annum. As the crude incidence rates of cancer in Kerala has not changed much over the years, such an increase in cases can only be attributed to the good quality of treatment rendered in the Centre. During the last five years, eighteen of the faculty members had excellent training in foreign countries and many others, in other parts of India. These coupled with the good diagnostic services of the Centre escalated the quality of the services.

This Centre can feel proud of having some firsts to its credit. The Community Oncology Division, Paediatric Oncology Division, Cytopathology and Clinical Research Divisions are some among these. Due to the activities of the Community Oncology Division and Early Cancer Detection Centres it was possible to improve the awareness of the public regarding cancer and influence the referral practices of the cancer patients to this Centre. This also helped in improving the clinical down staging of common cancers reported in the Centre. The Paediatric Oncology Division with its multi-disciplinary approach could tremendously improve the cure rates, which at present are comparable to those of developed countries.

To alleviate the financial burden on account of the high cost of cancer treatment, the Centre introduced in 1986 a unique "Cancer Care for Life" Scheme. By virtue of this the policy holder just for one time payment of Rs. 101 could get all the treatment facilities free of cost in case he becomes a cancer patient.

Despite several constraints the Surgical Oncology Division has achieved a very high standard and has evolved several new innovative techniques. The pain clinic run by this division is in accordance with WHO standards and specification. A new analgesic solution formulated for us by the College of Pharmaceutical Sciences, Trivandrum showed excellent results for the abatement of pain to the cancer patients.

Maintaining its link with the Medical College, Trivandrum, the Centre conducts postgraduate courses in Radiotherapy and also imparts training to several other postgraduates and undergraduates. In addition to this, the Centre conducts courses in vital areas of cancer control, such as Cytopathology, Imageology, Research Methodology and Cancer Registration.

In the field of research, the Centre made noteworthy contributions; and within this short span, more than 300 papers were published, many of which were in journals of international repute. The Clinical Research Division with its full electronic data processing facility is able to analyse and present the treatment results for some of the cancer sites. Natural Background Radiation Registry Study Project, National Cancer Data Base Programme, and the Hospital Cancer Registry are some of the excellent projects assigned to the Centre besides some foreign aided projects.

The first phase of the Regional Cancer Centre building involving a cost of 3.5 crores of rupees was completed in record time and commissioned during the year under report. The second phase of construction has already commenced.

In recognition of these achievements, the Regional Cancer Centre was declared as a Centre of excellence in the field of Science and Technology by the State Government and as an Institute under the Department of Scientific and Industrial Research Technology by the Government of India.

It would have not been possible for the Centre to progress so rapidly had we not received the support of the Ministries of the Centre and the State right from the beginning. This Annual Report for the year 1990-91 contains details of the activities of all divisions and the statement of accounts.

DEPARTMENTAL ACTIVITIES

DIVISION OF RADIOTHERAPY

Dr. M. Krishnan Nair	—	Director
Dr. N. Balakrishnan Nair	—	Professor
Dr. F. Joseph	—	Professor
Dr. B. Rajan	—	Associate Professor
Dr. T. Ganga Devi	—	Associate Professor
Dr. Sureshchandra Dutt	—	Associate Professor
Dr. P. G. Jayaprakash	—	Associate Professor
Dr. C. S. Rafeeka Beegum	—	Associate Professor
Dr. S. Parameswaran	—	Assistant Professor
Dr. V. Narayana Bhattathiri	—	Assistant Professor
Dr. Jayaprakash Madhavan	—	Assistant Professor
Dr. K. Ramadas	—	Assistant Professor
Dr. K. Ratheesan	—	Assistant Professor
Dr. Thomas Koilparambil	—	Lecturer
Dr. Francis V. James	—	Lecturer

CLINICAL SERVICE

The division of radiotherapy is responsible for primary care of most of the cancer patients seen in this centre. This division closely interacts with the other clinical and paraclinical departments within the Regional Cancer Centre, Medical College Hospital, Ophthalmic Hospital and the Sree Chitra Thirunal Institute for Medical Science and Technology, Trivandrum to ensure comprehensive care for the cancer patients. Efforts are being taken to develop consensus protocols for managing almost all cancers. The following figures on various services rendered by our division point to the magnitude of clinical work undertaken by the division.

Number of new patients referred for radiotherapy	—	5918
Number of outpatient visits	—	45505
Number of inpatients cared for	—	3045
Number of patients who had teletherapy	—	5285
Number of subjects who had brachytherapy	—	677
Interstitial implants	—	116
Intracavitary irradiation for gynaecological malignancy (Selectron)	—	451
Others	—	110

Equipments available for radiotherapy

Linear Accelerator	—	1
Theratron 780	—	1
Gammarex	—	1
Selectron	—	1
Simulator	—	1
Portable X-ray machines	—	2

ACADEMIC PROGRAMME

A regular teaching programme built over the last several years is the backbone of our academic activity. The teaching programme in clinical oncology for undergraduate students has been recently re-organised towards a proper orientation in cancer related check up and referral practices. The division is responsible for training 2 students for MD degree and 3 students for the Diploma Course (DMRT) in radiotherapy each year. In addition the faculty engage themselves in teaching oncology related topics for postgraduate students in Medicine, Surgery, Paediatrics, Gynaecology, Oto-rhino Laryngeology, Nursing and other super specialities. Regular weekly symposia and journal club programmes are conducted. Patient related clinical teaching is done in all working days.

COMBINED CLINICS

Combined clinics in association with gynaecologists (Gestational Trophoblastic tumour clinic), ENT (Head and Neck



Our Director, Dr. M. Krishnan Nair, receiving the prestigious ICMR Sandoz Award (for his outstanding contributions towards Oral Cancer Research) from Dr. Paintal, Director General, I.C.M.R., New Delhi.

Cancer Clinic), Paediatricians (Paediatric Cancer Clinic) and Gastro-enterologists (Gastroenterology tumour board) are conducted once a week.

TRAINING AND CONFERENCES ATTENDED BY THE FACULTY

1. Dr. P. G. Jayaprakash attended the National Seminar on Applied Immunology, 1991, at Trichur, India.
2. Dr. K. Ramadas attended "Oncology 91" at Gwalior and presented a paper on "Stage I Carcinoma Endometrium: An Analysis" during January 2-4, 1991.

PAPERS PUBLISHED / PRESENTED

1. Sankaranarayanan R, Duffy SW, Krishnan Nair, M, Padmakumary G, Day NE. Tobacco and alcohol as risk factors in cancer of the larynx in Kerala, India. *Int. J. Cancer* 1990, 45: 879-882.
2. Sankaranarayanan R, Duffy SW, Padmakumary G, Day NE, Krishnan Nair M. Risk factors for cancer of the buccal and labial mucosa in Kerala, India. *J Epidemiol Comm Health* 1990, 44: 286-292.
3. Rajan B. Spinal seedling in intracranial dysgerminoma. *Br. J. Cancer* 1990, 61: 339.
4. Bhattathiri VN, Rajasekharan Pillai B, Sasidharan K, Sudha L, Sudhakaran A. and Krishnan Nair M. Intraoral Dental Radiography: A neglected investigation in Oral cancer. *Ind J. Rad. Imageology* 58-59, 1991.
5. Bhattathiri, VN, Jayaprakash PG, and Krishnan Nair, M. Oxygen, Haemoglobin and Radiotherapy: The Indian Context. *Bulletin of the Association Medical Physicists of India*.
6. Bhattathiri VN, Remani, P, Raveendran, P, et al (1991) Radiation dose related changes in lectin staining pattern in oral squamous cell carcinoma. *BJR* 1991, 64 (supplement): 124.

7. Pillai, MR, Balaram P, Hareendran NK, Bindu S, Padmanabhan TK, Krishnan Nair M. Clinical and prognostic significance of concanavalin — A — induced suppressor cell activity in malignant cervical neoplasia. *Br J Obst. Gynecol* 1990, 97 : 357–361.
8. Pillai, MR, Balaram P, Bindu S, Hareendran NK, Padmanabhan, TK, Krishnan Nair, M. Radiation associated eosinophilia and monocytosis in carcinoma of the uterine cervix: A simple reliable clinical and prognostic indicator. *Neoplasma* 1990, 37: 91–96.
9. Krishnan Nair M, Mathew B, Sankaranarayanan R, Wesley R. Evaluation of control strategies for tobacco related cancers in Kerala, India. In: *Control of tobacco related cancers and other diseases. Proceedings of an international symposium, 1990.* Gupta PC, Hamner III JE, and Murti PR (eds) TIFR, Bombay 1990.
10. Stich HF, Rosin MP, Hornby AP, Mathew B, Sankaranarayanan R, Krishnan Nair M. Pilot intervention studies with carotenoids. In : *Carotenoids : Chemistry and Biology*, Krinsky NI et al (eds). Plenum Press, New York 1990. pp. 313–321.
11. Stich, HF, Tsang SS, Palcic, B, Mathew, B, Sankaranarayanan, R, Krishnan Nair, M. The usefulness of in vitro assays and animal experiments in the design of chemopreventive protocols with betacarotene and Vitamin A on tobacco users. In : *Nutrients and cancer prevention*. Prasad K. N., Meyskens Jr. FL (eds). The Humana Press, Clifton 1990.
12. Krishnan Nair, M, Sankaranarayanan R, Mathew, B, Stich HF. Dietary intervention in cancer. *Interdisciplinary Research Review* 1990; 1: 5–10.
13. Bhattathiri, VN, Padmanabhan, TK, Krishnan Nair, M. Comparison of external radiotherapy and external radiotherapy plus intraluminal brachytherapy as radical treatment for cancer oesophagus. In : *Recent advances in*



Dr. M. S. Valiathan, Director, S.C.T.I.M.S.T, recipient of Padma Bhushan replying to the felicitations given to him by R.C.C. on 3rd June, 1990.

Radiation Oncology. Jain V, Goel M, Pohlit W (eds).
ICMR, New Delhi 1990. pp. 344.

14. Bhattathiri VN, Krishnan Nair M, Periodontal Space : a major route to bone involvement in oral cancer. Med Hypo 1991, 3 : 58-59.
15. Bhattathiri VN, Sudha L, Rajasekharan Pillai B, Sudhakaran, A, Sasidharan, K, Krishnan Nair, M. Periodontal Space: Major route to bone in oral cancer. Eur J Cancer 1991, 2: 222.

DIVISION OF SURGICAL ONCOLOGY

Dr. Thomas Cherian	— Associate Professor
Dr. Gladys Jeevy	— Anaesthetist
Dr. Paul Sebastian	— Assistant Professor
Dr. Iqbal Ahamed, M.	— Assistant Professor
Dr. Santhosh John Abraham	— Lecturer
Dr. Vijaykumar, D. K.	— Lecturer
Dr. Jayakumar, K. L.	— Resident Surgical Officer
Dr. Sivaramakrishnan, P.	— Resident Surgical Officer

CLINICAL

Outpatient clinic works six days a week. All cases registered in RCC requiring surgery and also cases referred from elsewhere are routinely examined here. Also all cases operated by us are routinely followed up at regular intervals. On an average 10 to 15 cases are examined in the outpatient daily. However due to certain physical constraints and to maintain the quality of work we are constrained to handle only a small fraction of the total load of cases presented. This has paid us rich dividends in that our results continue to be better than those reported from the most advanced cancer centres in the world, stage for stage. In spite of the fact that most of the head and neck cancer cases we tackle are extensive residual or recurrent diseases following radical XRT with or without chemotherapy, and most patients in poor general condition, many in advanced age, and surgery extensive, and of long duration, our complication rates are within acceptable limits. Our perioperative mortality is nil till this day. In spite of the fact that we have no supporting facilities for rehabilitation, all our patients are well rehabilitated physically, functionally and socially by the time they are discharged. This is because of our strict adherence to our policy of primary reconstruction right from the beginning, to restore form and function following radical abalative procedures in head and neck cancers. We have probably the

largest number of primary reconstructive procedures for head and neck cancers in the country. This created a good impact on the public for seeking medical aid early for cancer. During the reporting year of 1990-91 a total of 439 cases were operated in this division of which 217 cases were major abalative procedures for recurrent carcinomas.

The split up of the major cases is shown below:

TABLE I

Total No. of cases	—	439
Major	—	224
Minor	—	215
Operative deaths	—	Nil
Perioperative complications	—	Less than 10 %
Do	deaths	— 2

TABLE II

Site-wise Distribution of Major Cases

Oral Cancer	—	158
Breast	—	31
Thyroid	—	17
Osteosarcoma Head & Neck	—	2
Adamantinoma mandible	—	1
Salivary tumour	—	1
Ca. Penis	—	2
Soft tissue sarcoma	—	3
Skin tumour	—	5
Para pharyngeal tumour	—	1
Metastatic lymph node from unknown primary	—	3

TABLE III

Oral Cancer Distribution

Buccal Mucosa	—	57
Tongue	—	50
Lower Alveolus	—	32
Floor of mouth	—	5
Lip	—	12
Upper alveolus	—	1
Palate	—	1
Total		158

TABLE IV

Tumour Clearance

(Microscopic Pathological tumour clearance all around the base and margins)

Site	Free			Positive
	Wide margin	Close	Dysplastic	
1. Buccal Mucosa 57	41/57 (72%)	9/57 (15.7%)	6/57 (10.5%)	1/57 (1.7%)
2. Tongue 50	38/50 (76%)	7/50 (14%)	2/50 (4%)	3/50 (6%)
3. Lower Alveolus 32	26/32 (81.25%)	3/32 (9%)	1/32 (3%)	2/32 (6%)
4. Floor of Mouth 5	5/5 (100%)	—	—	—
5. Lip 12	11/12 (91.6%)	1/12 (3.3%)	—	—

It is to be noted that we continue to maintain our high tumour clearance rate (>90%). The overall survival of the patients analysed over the years show that more than 56% of cases operated by us for extensive recurrent carcinoma are surviving disease free after 5 years.

TABLE V

Pattern of Nodal Involvement in Oral Cancers

Site	No.	N+					Contra-lateral
		I	II	III	IV	V	
Buccal mucosa	24	7	2	4	0	3	0
Tongue	17	2	7	9	1	3	5
Lower Alveolus	25	2	4	1	0	0	0
Floor of mouth	3	0	1	0	0	0	0

TABLE VI

Type of Neck Dissection

Ipsilateral Neck Dissection	FND only	—	19
Do	RND only	—	4
Do	Supraomohyoid	—	19
Do	FND + Contralateral Supraomohyoid	—	37
Bilateral FND		—	9
Ipsilateral RND + Contralateral FND		—	2
Do	RND + " Supraomohyoid	—	4
Bilateral Supraomohyoid		—	5
Ipsilateral FND + Contralateral	Suprahyoid	—	11
Do	RND + " Suprahyoid	—	2
Do	Supraomohyoid + " Suprahyoid	—	2
Do	Suprahyoid only	—	6
No Neck dissection		—	40

It is not our policy to do prophylactic neck dissection in cases of cancer of the oral cavity. Only when positive or highly suspicious nodes are present in the drainage areas we do neck dissections and the nature of the neck dissection is decided by the surgical appearance and extent of the nodes in the drainage area. The radical neck dissection is carried out only when the nodes are fixed or infiltrating the surrounding tissues.

TABLE VII

Flaps used for Reconstruction

	<i>No. Flap loss</i>	
Pectoralis major myocutaneous flap	63	Nil
Sternomastoid "	6	2
Platysma "	6	2
Nasolabial	11	Nil
Deltpectoral	1	Nil
	---	---
Total	87	
	---	---

ACADEMIC & RESEARCH ACTIVITIES

Being responsible for the academic programme of the Medical College, Trivandrum, we are actively involved in the under-graduate and post-graduate programmes of the Medical College. This division takes active part in all the academic activities of the centre, like morning clinic, seminars, workshops etc.

PAIN CLINIC

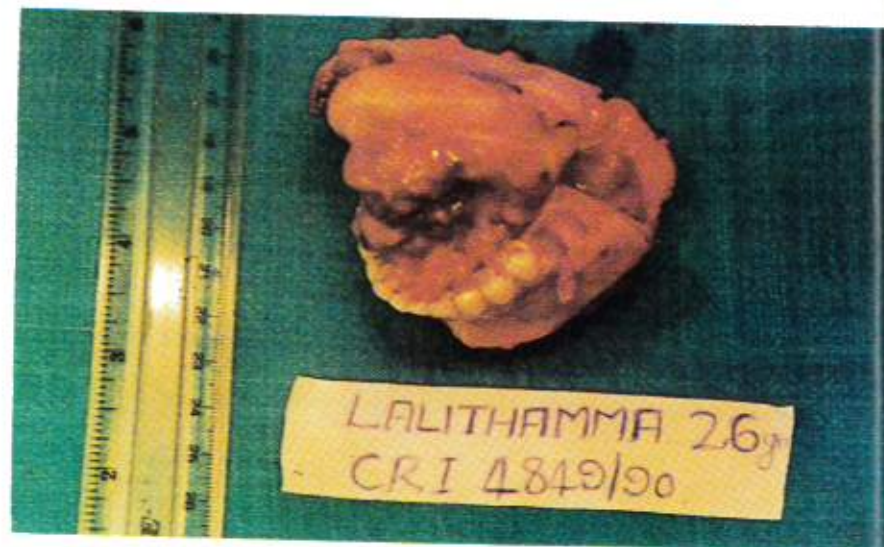
Pain clinic is conducted once a week by a multidisciplinary team comprising an anaesthesiologist, a surgeon, a radio-therapist and a staff nurse. During this year 330 new patients were registered in this clinic and a total 795 patients were treated. Patients whose symptoms are assessed for pain are prescribed oral analgesics according to the WHO step-ladder pattern.

During the year underreport with much difficulty we managed to get Morphine and the staff, College of Pharmaceutical Sciences, Trivandrum formulated a stable and palatable morphine solution exclusively for our centre. The first consignment of this was handed over to us, by Dr. V. K. Jayapalan, Principal, through Sri. M. S. Joseph, IAS, Secretary to Government, at a colourful function. The drug is being given free of cost to all patients irrespective of income groups, and within 2

AN INNOVATIVE TECHNIQUE PRIMARY PROSTHETIC IMPLANT
RECONSTRUCTIVE THE MANDIBLE.



Extensive recurrent malignant salivary tumour of the floor of the mouth involving arch of the mandible - Preoperative.



Excised Tumour of the patient.



Post operative views of the same patient

months more than 30 patients were the beneficiaries. It is quite gratifying to learn that this solution gave excellent results for the abatement of pain, in all these patients.

Miss. Gillian Burn, a WHO expert on palliative care visited this institution in Feb. 1991 and gave a lecture to the faculty members on multidisciplinary approach to palliative care. She also conducted a 2-day teaching programme for nurses on the "Nurses role in the management of patients with advanced cancer".

NEW OPERATIVE TECHNIQUES DEVELOPED IN RCC

1. We have evolved a new surgical technique for primary restoration of voice after total laryngectomy, which was done on two cases with moderate success. We are trying to improve the technique.
2. A new simple prosthetic implant for primary reconstruction of lower jaw after its removal for cancer with good cosmetic and functional result was developed. We have been using this routinely, especially for surgery for the arch of the mandible (See Fig. 1, 2, 3, 4 & 5).
3. Primary functional reconstruction of tongue following recurrent carcinoma of the tongue was done over the last 6 years in 200 cases of carcinoma tongue.
4. A simple technique for single stage primary reconstruction of lateral defect of the upper/lower lip with good functional and cosmetic results and as a better substitute for the standard Abbe Eslander Technique.
5. A simple single stage primary reconstruction of upper lip with normal hair bearing skin was also evolved.
6. Primary reconstruction of the palate following radical maxillectomy for Ca maxilla with good functional and cosmetic results.

PAPERS PRESENTED

1. "Eight years experience of salvage surgery and primary reconstruction for recurrent carcinoma of the oral cavity":

Dr. Thomas Cherian, Dr. Paul Sebastian, Dr. Jayakuma
Dr. Sivaramakrishnan, Dr. Gladys Jeevy. Oncology, 91 -
Gwalior December, 1990.

2. Dr. Thomas Cheriyan et al. "Simple Prosthetic implant reconstruction of arch of the mandible with good cosmetic and functional results". Oncology 91, Gwalior December, 1990
3. Dr. Paul Sebastian at the Oncology update session of the International College of Surgeons— South Indian Section at Kochi in December, 1990 "Oral Analgesics in the management of cancer pain."

DIVISION OF PAEDIATRIC ONCOLOGY

Dr. P. Kusumakumary : Assistant Professor
Dr. S. Rajeev Kumar : Lecturer

All patients under the age of 14 years were registered in this division.

Clinical activities

Number of new patients seen	—	215
Total number of out-patient visits	—	3025
Inpatient admission	—	215

The following is the list of new cases registered :

Leukaemias	—	67 (31%)
Brain tumours	—	45 (20.9%)
Lymphomas	—	12 (5.5%)
Soft tissue Sarcomas	—	16 (7.4%)
Bone tumours	—	10 (4.6%)
Wilm's tumour	—	10 (4.6%)
Retinoblastoma	—	13 (6%)
Neuroblastoma	—	11 (5.1%)
Germ cell tumours	—	6 (2.7%)
Hepatoblastomas	—	2 (2.7%)
Histiocytosis	—	4 (1.8%)
Miscellaneous	—	19

As in the previous years the most common malignancy in this age group was acute leukaemias of which 83% were acute lymphatic leukaemia and the rest were acute myeloid leukaemias. Two cases of chronic myeloid leukaemia were also registered in this year. All the newly registered acute lymphatic leukaemia cases were given induction treatment with standard chemotherapy protocol and 90% of them went into remission. They were put on maintenance chemotherapy.

Brain tumours constituted the second large group. Gliomas were common among the brain tumors. There was not much change in the relative frequencies of other solid tumors.

Out-patient clinic in paediatric oncology is being held on all days except Sundays as in previous years. Detailed diagnostic work up of all the patients were done as a routine.

Surgery was the primary modality for solid tumors followed by irradiation and/or chemotherapy depending upon the diagnosis and stage of the disease.

A well organised and co-ordinated multidisciplinary team consisting of Paediatric Oncologist, Paediatric surgeons, Pathologist, Radiation Oncologist and Radio-diagnostician met every Monday at 12 noon and major decisions regarding the management of paediatric cases were taken as in previous years.

Academic Activities

The division imparted teaching and training to MD Radiotherapy, DMRT, MD Paediatric students of Medical College, Thiruvananthapuram.

Conference attend/Papers presented

Dr. P. Kusumakumary attended the Indo US CME in Medical Oncology held at Bangalore from 13-16th December 1990.

Dr. P. Kusumakumary attended the 5th Biennial Conference of Indian Society of Oncology held at Cancer Institute, Gwalior during the January 3rd-6th 1991 and presented a paper on 'Paediatric Non-Hodgkin's Lymphoma - A Light at the End of Tunnel'.

Paper Published :

Sasidharan, K, Ramachandran, K, Pradeep, VM, Kusumakumary, P, Surendran, N, Krishnan Nair, M. Disappearing Interface in Ultrasonography. Ind. Jour. Rad. & Imaging. 44: 169-171, 1990.

DIVISION OF MEDICAL ONCOLOGY

Staff

Dr. V. P. Gangadharan — Assistant Professor
Dr. Cherian Varghese — Lecturer (30-4-90 to 30-1-91)

Medical Oncology as a separate division came into existence from January, 1990. This division is responsible for the primary care of all cases of acute and chronic Leukaemias, Lymphomas and Solid Tumours where aggressive chemotherapy is the main stay of treatment. This division also caters to the chemotherapy needs and assists in the management of treatment related toxicities in patients receiving multimodality programme.

Total Number of Cases — 294

<i>Diagnosis</i>	<i>No.</i>
Acute Lymphatic Leukaemia	— 43
Acute Myeloid Leukaemia	— 54
Chronic Myeloid Leukaemia	— 34
Chronic Lymphatic Leukaemia	— 17
Hairy cell Leukaemia	— 1
Non-Hodgkin's Lymphoma	— 69
Multiple Myeloma	— 18
Plasma cell Leukaemia	— 1
Solid tumours	— 45
Non-malignant conditions	— 12
	<hr/>
	294
	<hr/>

<i>Procedures</i>	<i>No.</i>
Bone Marrow aspirations	— 520
Bone Marrow Trephine Biopsy	— 275
Lumbar Puncture	— 400
Fine Needle Aspiration Cytology	— 200

Academic & Research Programmes

The Medical Oncology Division actively participates in undergraduate and postgraduate (Radiotherapy and General Medicine) teaching programmes.

Ongoing Projects:

1. Liver biopsy in Non-Hodgkin's lymphoma.
M. D. Thesis of Dr. Arun (M. D. General Medicine)
2. Prognostic factors and treatment related survival in Multiple Myeloma. (ICMR students fellowship programme. Mr. Eswar Krishnan, Final Year Medical Student, Medical College, Trivandrum.)
3. Retrospective studies on —
 - (a) Peripheral T cell lymphoma
 - (b) Acute Myeloid Leukaemia — Low dose Cytosar.
 - (c) Plasma cell leukaemia.
 - (d) Geriatric Non-Hodgkin's Lymphoma.

Special Oncologic Problems

ALL

The adult ALL's belong to the high risk group and the induction plan consists of 4 drugs. Vincristine, Leunase, Adriamycin and Prednisolone. Patient compliance is good and all patients are treated as inpatients during the induction phase.

AML

Two programmes are in use. Intensive chemotherapy, protocol with Cytosine, Arabinosine and Mitoxantrone and a palliative approach with low dose Cytosar as single agent.

Choriocarcinoma

High risk choriocarcinoma patients are identified and aggressive combinations like MAC (Methotrexate, Act D and Cyclophosphamide) and EMACO.

Soft tissue Sarcoma

Intensive multidrug chemotherapy is employed. The agents are Ifosfamide, Adriamycin and VP 16 (Etoposide).

Research Projects under consideration

1. NCI protocol for lymphoblastic lymphoma.
2. Antiemetics — trial of new agents.
3. Equivalence trial with Mitoxantrone.
4. Intensive induction protocols for AML.
5. Blood products in supportive care of myelosuppression.
6. Role of Beta 2 microglobulin as a prognosis indicator in Myeloma.
7. Immunopheno typing of leukaemias and lymphomas.

Training

Dr. V. P. Gangadharan underwent training in Indexing principles and CDS/ISIS (Version s, 3) at NIC, New Delhi.

Papers presented and Conferences attended

Dr. V. P. Gangadharan

1. Extra Nodal Lymphomas — Quarterly A. P. I. Conference at Cochin.
2. Advances in Cancer Chemotherapy — IMA Regional Chemotherapy Meeting, Tirupur, Tamil Nadu.
3. Basic Concepts in Cancer Chemotherapy — Southern Chapter of API, Kodaikanal
4. Management of Trophoblastic tumours — Association of OBG, Trivandrum.
5. Chemotherapy in Adult malignancies — National Conference of IMA, Trivandrum.
6. Chemotherapy of Solid Tumours — IMA, Kothamangalam.
7. Focus on Interferons, Bombay.

8. Southern Chapter of T.S.O. — Conference at Bangalore

Dr. Cherian Varghese

9. Chemotherapy of Cancer — State Conference of Institute of Homoeopaths, Attingal

10. Treatment Modalities in Cancer — CME programme, Medical College, Calicut.

Articles in Lay Press

1. Chemotherapeutic drugs — Arogyam — IMA publication
2. Cancer Treatment — Advances. "Manasastram".

Papers submitted for publication

Gangadharan, V. P., Cherian Varghese, Elizabeth Abraham, Krishnan Nair, M., — Extraskelatal Osteosarcoma (American Journal of Clinical Oncology)

DENTAL WING

Dr. Nalinakumari, K. R. — Lecturer

Main activities of this division are —

1. Dental extractions
2. Biopsies
3. Preparing biteblocks, prosthetic appliances
4. Preparing moulds
5. Management of pre-cancerous and other oral lesions
6. Participation in research projects

During the year 1990-91, the following services were rendered:-

1. Total number of sittings of patients	—	2636
2. Number of new cases	—	775
3. Number of biopsies	—	616
4. Number of biteblocks and moulds	—	103
5. Supplementary registered cases	—	37

Details of Sites and Number of Biopsies

1. Right buccal mucosa	—	110
2. Left buccal mucosa	—	106
3. Right commissure	—	20
4. Left commissure	—	12
5. Hard palate	—	31
6. Soft palate	—	8
7. Right Retromolar region	—	34
8. Left Retromolar region	—	24
9. Dorsum of tongue	—	35
10. Left Border of tongue	—	64
11. Right border of tongue	—	53
12. Under surface of tongue	—	3
13. Floor of mouth	—	10
14. Left lower alveolus	—	32
15. Right lower alveolus	—	21
16. Right upper alveolus	—	5
17. Left upper alveolus	—	0
18. Right lower sulcus	—	9
19. Left lower sulcus	—	11
20. Left upper sulcus	—	4
21. Right upper sulcus	—	7
22. Lower lip	—	25
23. Upper lip	—	2

The Dental Wing has performed total dental extraction where poor oral hygiene was indicated. The wing is trying to attend to most of such cases as early as possible. We undertake to prepare biteblocks in cases of patients who require radiation in addition to preparation of moulds for cases requiring radium therapy in sites like hard palate, maxillary antrum and lip cases.

Normally cases that come to us represent pre-cancerous lesions like Leukoplakia, SMF, lichenplanus etc. All since efforts are made to impart proper guidance on oral hygiene, oral prophylaxis and advice on modified diet to these patients with pre-cancerous and cancerous lesions. Usually monthly check up is done to assess their conditions and to take further necessary steps in these cases.

Biopsies have been taken from all the suspected cases referred to the department.

Research Activities

The wing is taking part in the research activities undertaken by Research Division and the Radiotherapy Department. Full co-operation is also extended to the research work under various schemes such as ICMR, DST, STEC funded project in so far as the necessary schemes required by the various divisions are supplied by this section. This department is rendering necessary help in the preparation of Ph. D. thesis of the postgraduates in various departments.

Papers published

1. Evaluation of the potential use of electron microscopy for early detection of malignant changes in oral Leukoplakia. Kannan, S., Kartha, C. C., Prabha, B., Joy, A., Nalinakumari, K. R., Hareendran, N. K., and Krishnan Nair, M. (Proceedings of the Kerala Science Congress February-March, 1991, page 241-243).
2. Erythrocyte rosetting by CD₂ receptor bearing lymphocytes as a reliable index of immunoregulation in oral cancer patients — A preliminary report. Girija Meenattokkuttan, Prabha Balaram, Nalinakumari, K. R., Sudha, L., Hareendran, N. K., and Krishnan Nair, M. Proceedings of the Kerala Science Congress Feb.-March, 1991, page 232-233. Edited by Prof. N. Balakrishnan Nair.

DIVISION OF NURSING SERVICE

Sr. Vijaya Puthuserril : Nursing Superintendent

The nursing service division as a separate entity has taken its shape in January 1991 with the appointment of a full time Nursing Superintendent. There are 28 staff nurses recruited through the employment exchange. It is expected that very soon the department will have head nurses, more staff nurses and nursing assistants in the cadre to give quality care to the cancer patients.

Distribution of work

The nurses render services in various departments like Out-patient department, Laboratory, Reception, Imageology, Medical, Surgical and Paediatric Oncology, Chemotherapy Unit etc. Chemotherapy is given in a day care unit and it is totally managed by staff nurses and it is all the more so because bystanders are not allowed. The IP division is still in the old block which is managed by Medical college as well as RCC nursing staff. Unlike any other hospital this centre being a different kind by its nature, catering only the cancer patients, the nurses working here are constantly being reminded of themselves the need to be extremely patient, kind, courteous, sympathetic and compassionate in their dealings with such patients and relations.

Accommodation

A rented house has been provided as nurses quarters. Very soon they will be provided with maximum living facilities.

Teaching and Training

The department is also open to other nurses, nursing students for visits and academic trainings. The B. Sc and M. Sc nursing students of the Medical College utilize the services of RCC for the academic purposes. Two batches of public health nurses of the Health Services were given 2 days training in this centre.

Future Plans

Strengthening the staff position, functions of the Medical and Surgical Oncology wards, inservice training programmes for Nurses.

&

Starting of a Nursing Research Cell, are some of the programmes envisaged for the next year.

DIVISION OF CYTOPATHOLOGY

1. Dr. N. Sreedevi Amma — Professor
2. Dr. B. Chandralekha — Associate Professor
3. Dr. Elizabeth K. Abraham — Associate Professor
4. Dr. G. Rajasekharan Pillai — Assistant Professor
5. Smt. J. Ambika Kumary — Senior Scientific Officer.
6. Sri. G. Reghunathan Nair — Cytologist.

ACTIVITIES

The important activities are more or less on the same lines as those of the previous year.

1. Screening of symptomatic women attending Gynaecological outpatient of SAT Hospital, Thiruvananthapuram for detection of precancerous and early cancerous lesions of the uterine cervix.
2. Assessment of Hormonal Status of pregnant women with bad obstetric histories like repeated abortion, spotting in the early months of pregnancy etc.
3. Population screening for cervical cancer and precancer from various cancer detection camps organised by the community Oncology Division of Regional Cancer Centre and a few smears from PHC Thrikadavoor, Quilon.
4. Cytodiagnostic aspiration and their interpretations from patients attending the Centre, MCH, SATH, SCD Hospital, Pulayanarkottah, Dental College and a few nearby Government Hospitals, viz., General Hospital, W & C, Thycaud, District Hospital, Peroorkada, Taluk Hospital Chirayinkil etc.
5. Examination of fluids like ascitic fluid, pleural fluid, CSF, Urine, Bronchial washings etc., for malignant cells from patients attending the Regional Cancer Centre, MCH, SATH, SCD Hospital and other nearby Government Hospitals.

6. Examination of sputum for malignant cells from patients of RCC, SCD and MCH.
7. Peripheral smear and Bone Marrow examination and reporting of patients of Regional Cancer Centre.
8. Histopathological examination of surgical specimens and review of Histopathology slides of patients referred to Regional Cancer Centre from other Hospitals with biopsy slides/Blocks/Specimens.
9. Teaching and Training.
10. Research work — Analysis of lesions and projects:
 - (a) Fine Needle Aspiration Cytology of ENT lesion — 6 years 1984–1989.
 - (b) Fine Needle Aspiration Cytology of Thyroid lesion — 7 years 1983–1989.
 - (c) Project — Cytological Evaluation of Atrophic Cervical Smears and Oestrogen application as an aid in diagnostic problems.
 - (d) Lectin Histochemistry.

Gynaec Cytology

During the year under report cervical smears were examined from 7938 women majority being from SAT Hospital Thiruvananthapuram. This is 794 smears less than that of the previous year. Detailed analysis of the lesion is shown in Table I.

TABLE 1

Analysis of Cervical Smears

A detailed analysis of cervical smears shows the following findings :-

Lesions	No. of cases
Normal	— 2008
Nonspecific inflammation	— 4126
T. V. Infection	— 182 + 40 associated with dysplasias included along with dysplasia.
Fungal infection	— 62
H. P. V. infection	— 1
Herpes virus infection	— 2 + 4 — associated with dysplasias.
Glandular cell hyperplasia	— 96
Reserve cell hyperplasia	— 57
Endocervical regeneration	— 109
Mild dysplasia	— 745
Moderate dysplasia	— 94
Severe dysplasia	— 39
Atypical cells	— 27
Dysplasia unclassified	— 80
Carcinoma in situ	— 19
Suspicious of malignancy	— 27
Micro invasive Ca.	— 1
Malignant cells (Unclassified)	— 12
Invasive squamous Ca.	— 112
Adeno Carcinoma	— 10
Radiation change	— 10
Miscellaneous	— 8
Unsatisfactory	— 111
	— —
Total	7938
	— —

Population Screening in Thrikkadavoor

From the PHC, Thrikkadavoor 226 smears were received during the year out of which 4 cases of mild dysplasias, and 2 cases of invasive squamous Carcinomas were reported.

Hormonal Cytology: During the period under report Vaginal smears were examined from 753 women for hormonal assessment.

Non Gynaec and Aspiration Cytology including Body Fluids

During the period under report 5163 smears from fluids and FNACs were examined from 4681 persons out of these 482 were repeat smears and 237 belonged to miscellaneous group due to various reasons like nonmentioning of the site no definite diagnosis etc. These 719 smears were excluded from the analysis. Thus analysis was done in 4444 cases only out of which 112 were body fluids and cyst fluids and 3319 were FNACs.

Chart 2: ANALYSIS OF BODY FLUIDS

Site	Malignancy	Suspicious	Non-Neoplastic	Total
Ascitic fluid	36	14	272	322
Pleural fluid	54	9	220	283
Urine	1	2	181	184
CSF	13	2	284	299
Bronchial washings	—	—	1	1
Gastric lavage	—	—	1	1
Pouch of Douglas	2	—	16	18
Pericardial fluid	3	1	6	10
Cyst Fluids	2	—	5	7
Total	111	28	986	1125

The total number of smears examined in this group were 1317 less compared to that of the previous year. One reason for this might be that FNAC was started in Medical College Hospital by the Department of Pathology.

Detailed analysis of fluids and FNACs are shown in Table '2' and Table '3' respectively.

TABLE 3
Analysis of F.N.A.C.

Site	Total	Malignant	Suspicious	Benign	Non-neoplastic
Thyroid	1435	56	82	64	1233
				(Folli. Neopla.)	
Lymphnode	672	198	23	nil	451
Breast	535	114	27	102	292
Liver	125	36	8	nil	81
Oral cavity	101	21	4	nil	76
Skin & subcut. tissue	81	40	1	2	38
Bone	62	25	1	3	33
Lung and Pleura	61	23	2	nil	36
Salivary gland	36	6	nil	5	25
ENT	34	12	3	1	18
Female geni. tract	28	8	2	1	17
Male geni. tract	23	10	1	nil	12
Abdominal Mass	16	4	nil	nil	12
Urinary system	7	2	nil	nil	5
GIT	6	4	nil	nil	2
Retroperitonium	5	2	nil	nil	3
Pancreas	4	nil	nil	nil	4
Eye	4	1	nil	nil	3
Bone marrow	1	nil	nil	nil	1
Thymus	1	1	nil	nil	nil
Miscellaneous	82	13	6	2	61
Total	3319	576	160	180	2403

Sputum Cytology

Sputum samples were examined from 645 patients and 14 patients the series was repeated. 3 to 5 or more samples were examined from each patient and hence the total smears examined were 5272. Compared to the previous year this was 322 patients less. Detailed analysis is shown in table 4.

TABLE 4
Analysis of Sputum Cytology

<i>Lesion</i>	<i>Total No. of Cases</i>
No malignant cells	— 28
Fungus	— 18
Squamous metaplasia	— 12
Atypical cells/suspicious of malignancy	— 4
Squamous cell Carcinoma	— 1
Adeno Carcinoma	— 1
Large cell anaplastic Carcinoma	—
Small cell Carcinoma	—
Repeat sample	— 1
Total	— 68

Buccal Smears

Buccal smears were examined from 97 patients for schistosome chromatin. Two smears were examined from each patient. Barr body was negative in 38 cases and positive in the rest of the cases.

Bone Marrow Aspirations

Bone marrow was examined from 743 cases. The detailed analysis is shown in Table 5.

TABLE 5

Analysis of Bone Marrow

1. Acute Lymphatic Leukaemia	— 71
2. A. L. L. Follow up	— 123
3. Acute Myeloid Leukaemia	— 48
4. AML follow up	— 22
5. Acute Leukaemia unclassified	— 4
6. Chronic Myeloid Leukaemia	— 24
7. C. M. L. follow up	— 7
8. C. M. L. blast crisis	— 4
9. Chronic Lymphatic Leukaemia	— 9
10. Multiple Myeloma	— 18
11. Multiple Myeloma follow up	— 1
12. Plasma cell Leukaemia	— 2
13. Hairy cell Leukaemia	— 1
14. Non Hodgkin's Lymphoma infiltration	— 45
15. NHL — No infiltration	— 133
16. Hodgkin's disease infiltration	— 5
17. H. D. No infiltration	— 59
18. Neuroblastoma infiltration	— 4
19. Neuroblastoma — No infiltration	— 4
20. Neuroblastoma follow up	— 1
21. Sezary syndrome	— 2
22. Carcinomatous infiltration	— 5
23. Rhabdomyosarcoma infiltration	— 1
24. Undifferentiated malignant cells	— 2
25. Aplastic Anaemia	— 4
26. Myelofibrosis	— 2
27. Hypereosinophilic syndrome	— 1
28. Others	— 143
Total	— 745

HISTOPATHOLOGY

As in the previous years the main stress was on diagnostic aspect which included detailed H. P. examination of surgical specimen of the centre and review of slides of patients referred from outside hospitals which often involved recutting of blocks or even reprocessing of specimens for special stain etc.

Total Cases

During the said period specimen from 2913 patients were examined out of which 1972 were from the centre and 941 were review slides. This is 425 cases more than that of the previous years. A detailed analysis is given in Table 6.

TEACHING AND TRAINING

This division actively participated in the teaching and training programme of the Medical College, Thiruvananthapuram. The following categories of students were entertained.

M. B. B. S. Students

They are regularly posted in the Cytology Lab during their rotation posting in clinical Pathology and are given an insight into cytological methods of diagnosis and their importance in patient management.

Post Graduate Students

Pathology Post Graduates of Thiruvananthapuram Medical College were given training in Cytology for 3 months during their M.D. course and DCP candidates were given training in cytology for 1 1/2 months. In addition to this the staff members of the Division discussed various topics of interest in Cytology in the morning teaching sessions organised in the Department of Pathology of the Medical College, Thiruvananthapuram. Dr. Elizabeth K. Abraham conducted a lecture-cum-slide discussion on Lymphomas for P.G. students of Medicine and Radiotherapy.

TABLE 6

Histopathology at a Glance

ICD	Site	Benign	Uncertain benign/ Malignant	Carcinoma in situ	Malignant Primary	Non-neo-plasm	Malignant metastasis	Total
9	2	3	4	5	6	7	8	9
140.	LIP	..	..	..	62	36	..	98
141.	Tongue	1	..	..	218	63	..	282
142.	Salivary Gland	2	1	..	10	4	..	17
143.	Gum	..	..	..	91	21	..	112
144.	Floor of mouth	..	..	..	19	2	..	21
145.	Other mouth	..	4	..	336	137	..	477
146.	Oropharynx	..	..	..	13	..	..	13
147.	Nasopharynx	1	..	..	6	1	..	8
148.	Hypopharynx	..	..	..	8	1	..	9
149.	Pharynx etc.	1	..	..	4	..	..	5
150.	Oesophagus	..	..	..	24	3	..	27
151.	Stomach	..	..	..	9	1	..	10
152.	Small Intestine	..	..	..	5	..	..	5

1	2	3	4	5	6	7	8	9
153.	Colon	..	..	..	9	3	..	12
154.	Rectum	..	..	..	11	..	..	11
155.	Liver	..	..	..	11	5	2	18
156.	Gall Bladder	..	..	..	1	..	..	1
157.	Pancreas	..	..	..	2	..	..	2
158.	Retroperitonium	..	..	..	4	1	3	8
159.	Other Digestive tract	..	..	..	1	1	..	2
160.	Nasal cavity	1	..	..	6	2	..	9
161.	Larynx	..	..	1	16	1	..	18
162.	Lung	..	..	..	10	1	3	14
163.	Plueura	..	..	..	..	1	..	1
164.	Thymus etc.	1	..	..	..	..	..	1
169.	Bone Marrow	..	..	..	..	..	..	1
170.	Bone	2	1	..	62	144	1	207
171.	Conn: Tiss	2	3	..	21	7	1	32
173.	Skin — other	6	2	..	26	4	2	37
174.	Breast — Female	7	1	9	52	35	6	102
175.	Breast — Male	..	..	..	136	25	..	178
179.	Uterus	3	..	..	..	2	..	2
180.	Cervix	2	..	13	5	3	..	11
181.	Placenta	..	..	..	322	129	1	467

1	2	3	4	5	6	7	8	9
182.	Body Uterus	..	..	..	16	11	..	27
183.	Ovary	3	4	..	30	5	1	43
184.	Vagina	..	..	1	24	5	..	30
185.	Prostate	..	..	..	10	2	..	12
186.	Testis	..	1	..	20	..	1	22
187.	Penis etc.	..	..	..	4	1	..	5
188.	Bladder	..	..	..	9	1	..	10
189.	Kidney	..	..	..	8	..	..	8
190.	Eye	..	1	..	4	1	..	6
191.	Brain	1	..	..	13	..	1	15
193.	Thyroid Gl.	9	..	..	49	13	..	71
194.	Oth. Endocr. Gl.	..	..	..	..	1	..	1
195.	Ill Def. sit	3	..	..	11	5	..	19
196.	Lymph node	1	1	..	126	67	150	345
	Miscellaneous	..	..	..	..	..	..	80
	Total	46	19	25	1825	746	172	2913

Post Graduates of other Departments of Medical College Thiruvananthapuram were given guidance in their thesis work which involved Cytological aspects. The thesis on Fine Needle Aspiration Cytology of Thyroid which Dr. B. Chandralekha was guiding last year was submitted to the university by a Post Graduate student in Pathology during this year.

Besides these Pathology Post Graduates of Kottayam and Calicut Medical Colleges were also given one week training in the interpretation of various cytology materials.

PARAMEDICAL COURSES

DMLT Students who were posted on a rotation basis for two weeks in batches of 4 to 5 students were given training in Cytopreparatory techniques.

B. Sc MLT students who were also posted in batches of two to three students for 1 1/2 months were given practical training in Cytopreparatory techniques with demonstration of normal and abnormal smears, in addition to 13 to 15 lecture classes.

B. Sc. MLT students of Gandhiji University, Kottayam were also given one week training in cytopreparatory techniques with demonstration of normal and abnormal smears.

General Nursing and Female Health Supervisor Trainees who were posted in the Division were also given training in collection, fixation and mailing of cervical smears, Register maintenance and their role in organisation of population screening and National Cancer Control Programmes.

Cyto-technician and Cyto-technologist Training Courses

Full time training courses are conducted for cyto-technicians (6 months) and Cyto-technologists (1 year) based on set objectives and specified curriculum. The 7th batch of Cyto-technicians has passed out in February 1991 and the 5th batch of Cytotechnologists in August 1990.

CME Programmes

Oncocytohistopathological CPCS are conducted in the centre. In addition to this Dr. N. Sreedevi Amma participated as a faculty member in the CME Programme on 'Nodular lesions of thyroid' organised by the Department of Pathology, Medical College, Kottayam and discussed the value of Fine Needle Aspiration Cytology in the diagnosis and management of nodular lesions of thyroid.

Research

Fine Needle Aspiration Cytology and scrape smears as an aid in the diagnosis of ENT Tumours – 6 years from 1984–1989.

An analysis of 1014 Fine Needle Aspiration Cytology samples received in our Laboratory from ENT sites was done to find out its value in the diagnosis and management of tumours in these sites. Samples were received from ear, nose, paranasal sinuses, pharynx, nasopharynx, Tonsil, vocal cord, glottis, epiglottis, cricoid, larynx, pyriform fossa etc. Maximum number of cases were from larynx (199 cases — 21.03%). 68 samples (6.7%) were unsatisfactory and excluded from study. Out of the rest 946 cases 309 (32.66%) were malignant lesions. The predominant lesions were squamous cell Carcinomas (63.75%) 75 cases (27.2%) were reported as poorly differentiated Carcinomas, out of which 19 cases (6.15%) showed the morphology of Nasopharyngeal anaplastic Carcinoma. Other malignant lesions diagnosed were adenoid cystic Carcinoma, mucoepidermoid Carcinoma, adeno-Carcinoma, myeloma, ameloblastoma, neurofibrosarcoma, Sarcoma botryoides etc. Benign tumours like neurofibroma, pleomorphic adenoma, and pigmented neuroectodermal tumour of infancy were also diagnosed. 78 cases (8.25%) were reported as suspicious or suggestive of malignancy. There was a good cytohisto correlation (100%—165 cases) for the positive cases reported. There was no false positive report in this series and false negative rate was low (3.7%).

Age-wise analysis showed that samples were received from all age groups ranging from 2 months to 80 years and above with

maximum number of malignant lesions in the 7th decade. The mean age for malignant lesion was 55.18, while those for inflammatory and benign lesions was 45.44 and mean age of the total cases was 48.04.

Sex-wise analysis showed a male preponderance. The Male-Female ratio of the total cases was 3 : 1, while that of inflammatory and benign lesions was 2.07 : 1 and that of malignant lesions was 6.19 : 1.

The study showed that FNAC is a valuable and simple diagnostic method for the management of lesions from ENT sites especially of the paranasal sinuses and throat. No serious complications due to FNAC occurred in these cases.

2. Fine Needle Aspiration Cytology as an Aid in the Diagnosis and Management of Thyroid Lesions

An analysis of FNACs performed in our laboratory during the past 7 years from 1983 to 1989 was done with a view to find out the reliability and diagnostic significance. F.N.A.C. was done by cytopathologist using a 23 or 24 gauge needle and 5-10 ml. syringe after doing ultrasound and nuclear scan and delineating hypoechoic areas and cold nodules. During this period a total of 4799 cases were aspirated, stained by Papanicolaou technique (and a few by MGG stain) and reported. Out of these 214 (4.6%) cases were reported as malignant lesions of various types. 4191 (87.12%) cases were benign or inflammatory lesions and 404 (8.42%) were unsatisfactory smears. Predominant malignant lesion diagnosed was papillary carcinoma (85 cases-39.71%). The other malignant lesions were follicular carcinoma (21.96%), Large cell Anaplastic Carcinoma (13.55%), medullary Carcinoma (6.07%), Squamous cell Carcinoma (1.40%) and Carcinoma Thyroid unclassified (17.29%). Besides there was a group reported as follicular neoplasm, where it was impossible Cytologically to say whether these were follicular adenoma or Carcinoma. Among the benign and inflammatory group 48 cases (10.14%) were reported as chronic Thyroiditis. In a few cases it was possible to diagnose granulomatous Thyroiditis.

This study showed that F.N.A. Cytology is a simple and reliable technique for the diagnosis of various lesions of Thyroid especially papillary, medullary and Anaplastic Carcinomas and Thyroiditis. It was also helpful to evaluate cold and hypoechoic nodules of Thyroid.

3. Cytological Evaluation of Atrophic Cervical Smears and Oestrogen Application as an Aid in Diagnostic Problems

This has been done as a project in co-ordination with the Department of Obstetrics and Gynaecology, SATH.

During the last two years a total of 14,993 women, symptomatic as well as asymptomatic were cytologically screened in our centre by pap smear. Of these 3,940 were of the post menopausal age group. It was observed that 30% of them showed normal atrophic pattern; 36.3% with non-specific inflammatory pattern; 1.82% with specific inflammatory pattern (T. V., fungus, Herpis etc.); 9.54% with dysplastic changes (mild, moderate, severe); 0.35% with Ca. In situ changes; 4.36% were positive for malignancy and 1.64% presented an abnormal pattern. In the last category (64 cases) often we experienced real problems in interpreting the smears especially when there was marked autolysis and drying. For such cases, advised local oestrogen cream application for 5 consecutive days and a repeat cervical smear two days after stopping the cream application.

In almost all the cases there is an apparent 'Hormone deafness' of malignant tumour cells to administration of oestrogen and will reveal clearly defined malignant tumour cells mixed with mature squamous epithelial cells. This helped us to give a definite diagnosis in problematic smears. Oestrogen application as an aid in diagnosis in problem cases is based on evaluation of the background of the epithelial cells; a quantitative relationship of various cell types; and the degree of degeneration of the abnormal cells; but not on any specific cellular criteria. From a total of 3,940 cases the oestrogen test was applied for 24 cases about 0.7%. In all cases oestrogen test is really helpful to rule out or confirm the presence of a squamous carcinoma or a dysplasia of the uterine cervix or vagina.

4. Potential application of Jack fruit lectin as a diagnostic marker in exfoliative cytology and Histology of broncho pulmonary neoplasia

An N-acetyl D-galactosamine specific lectin was isolated from the seeds of jack fruit (*artocarpus integrifolia*) and conjugated to horse radish peroxidase (HRP). The purified conjugate was used for histo-cyto-chemical studies of benign and malignant lesions of the respiratory tract using diaminobenzidine (DAB) as substrate on ethanol-ether (1:1) fixed thin film of cytological smears and deparaffinised tissue sections. Diagnostic accuracy of the Jack Fruit Lectin (JFL) labelling on cytological smears and tissue sections were compared with that of Papanicolaou and Hematoxylin-Eosin staining methods respectively.

Forty cases of sputum samples from patients with benign respiratory tract lesions, 20 squamous cell Carcinoma, 16 adenocarcinoma, 12 small cell anaplastic Carcinoma and 5 large cell anaplastic Carcinoma were used for the cytochemical studies. Corresponding histopathological cases were used for comparison of the binding pattern of the lectin. The lectin binding was strong in squamous cell Carcinoma, large cell anaplastic Carcinoma and adenocarcinoma. We have observed variations in the binding pattern in different carcinomas, though the nature of binding was eventually similar in cytology and histology.

JFL was reported to be capable of recognising incomplete nonsialated forms of membrane glycoconjugates and since the less than fully differentiated forms may appear on the surface of malignant cells than their normal counterparts, JFL may be of use as a diagnostic marker. The ready availability, the ease of preparation in purified form and the fact that the lectin can be conjugated to any diagnostic marker make the lectin a potent histochemical reagent for exfoliative cytology. This study was done in association with the Research Division of R.C. and the Department of Pathology, Medical College, Thiruvananthapuram.

5. Immunohistochemical staining on childhood Rhabdomyosarcomas was done in collaboration with Department of Pathology

Medical College, Thiruvananthapuram. This was a Science and Technology assisted project (2 years)

Conferences, Symposium, Seminars and Workshops attended

Dr. N. Sreedevi Amma:

1. XX Annual Conference of IAC, J. N. Medical College Belgaum on 30th and 31st October 1990.
2. Symposium and workshops on Colposcopy and Cervicography, Coimbatore 18th to 20th January 1991.
3. CME Programme (Faculty Member) at Medical College Kottayam on 26-1-1991.
4. Kerala Chapter, IAPM, SCT Medical Centre, Thiruvananthapuram January 27th 1991.

Dr. B. Chandralekha:

1. Kerala Chapter IAPM, Medical College, Alleppey on 14-7-90
2. XX Annual Conference of IAC, J. N. Medical College Belgaum 30th and 31st October 1991.
3. CME Programme at SCTIMST on 26-1-1991.
4. Kerala Chapter IAPM at SCTIMST on 27-1-1991.

Dr. Elizabeth K. Abraham:

1. Kerala Chapter IAPM at Alleppey Medical College on 14-7-1990.
2. CME Programme at SCTIMST on 26-1-1991.
3. Kerala Chapter IAPM at SCTIMST on 27-1-1991.

Dr. G. Rajasekharan Pillai:

Attended the demonstration of 'Coulter flow Cytometer' and participated in the discussions held at Kidwai Memorial Institute, Bangalore on 26-3-1991.

Sri. Raveendran Pillai:

1. XX Annual Conference of IAC, J. N. Medical College, Belgaum, 30th and 31st October 1990.

2. III Annual Conference of the Society for Research on Polyunsaturated Fatty Acids, December, 5, 6, 7 Thiruvananthapuram.
3. CME Programme on 'Science in the Service of Medicine', Kerala Academy of Sciences (Life Science Chapter) January 25, 1991, Medical College, Thiruvananthapuram.
4. Kerala Science Congress, February 28 to March 3, 1991, Kozhikode.
5. National Seminar on Applied Immunology conducted by Indian Immunological Society, Department of Biotechnology, Government of India and STEL, Government of Kerala, March 24, 1991, Medical College, Trissur.

Smt. Molykutty John :

1. XX Annual Conference of IAC, J. N. Medical College, Belgaum 30th and 31st October 1990.
2. CME Programme on 'Science in the Service of Medicine', Kerala Academy of Science (Life Science Chapter) January 25, 1991, Medical College, Thiruvananthapuram.

Papers Presented in Conferences/Published

Dr. N. Sreedevi Amma :

1. 'FNAC and Scrape Smears as an Aid in the Diagnosis of ENT Lesions', XX Annual Conference of IAC, 1990, Belgaum.
2. 'Evaluation of Cervical Cytology' — Crab.

Dr. B. Chandralekha :

FNAC as an Aid in the Diagnosis and Management of Thyroid Lesions — XX Annual Conference of IAC, 1990, Belgaum sent for publication.

Dr. Elizabeth K. Abraham

1. Presented two Interesting and Problem cases at the IAP Chapter meeting held at SCTIMST.

2. Malignant Systemic Mastocytosis — Sent for publication
- Sri Raveendran Pillai, K.:

1. Potential application of Jack fruit lectin as a diagnostic marker in exfoliative cytology and histology of bronco-pulmonary neoplasia — XX Annual Conference of IAC, Belgaum, 1990.
2. Serum lipids, lipid peroxide and ceruloplasmin levels in the premalignant and malignant lesions of the oral cavity — a preliminary study — III Annual Conference of the Society for Research on Poly unsaturated fatty acids — Symposium on Biological oxidation and poly unsaturated fatty acids 1990, Thiruvananthapuram.
3. Jack Fruit Lectin as a diagnostic marker in Lung Cancer — paper presented and published in the proceedings — III Kerala Science Congress, 1991, Kozhikode.

Smt. Molykutty John:

1. Cytologic evaluation of atrophic cervical smears and oestrogen application as an aid in diagnostic problems — XX Annual Conference of IAC, J.N. Medical College, Belgaum 30th and 31st October 1990. This paper has won the Jwala Devi Award for the best paper presented by Cyto-technologists in the conference.
2. Evaluation of Cervical Cytology in the diagnosis of Cervical Malignant and Pre-Malignant lesions — Accepted for publication.

Other Activities

This Division played an active role in the early cancer detection programmes of the centre. The staff of this division both medical and paramedical actively participated in various cancer detection camps organised by the community oncology division and were given facilities to collect cervical smears and FNAC at the camp site and helped in the follow up of positive cases.

DIVISION OF IMAGEOLOGY

Dr. K. Sasidharan	: Professor
Dr. V. Padmanabhan	: Associate Professor
Dr. Alex K. Ittyavirah	: Associate Professor
Dr. V. M. Pradeep	: Assistant Professor
Dr. K. Ramachandran	: Assistant Professor
Mr. Raghuram K. Nair	: Assistant Professor
Dr. A. S. Krishna Kumar	: Lecturer

Clinical Services :

Two major X-ray equipments started functioning this year. A 500 mA X-ray machine with fluoroscopy and tomographic attachment was installed and started functioning from June 1990.

X-ray computerized tomographic scanner donated by the Government of Japan under JICA programme was installed and started functioning from August, 1990.

19,795 new cases were registered during the year 1990-91. The break up of various imaging investigations and iodine therapy done during the period is as follows:

General ultrasonography	— 7011
Thyroid ultrasound/isotope scan	— 6822
Isotope scan of liver, bone, kidneys, brain etc.	— 1051
Iodine 131 therapy	— 128
Mammogram	— 192
X-ray investigations	— 3634
CT Scanning	— 945
CT/US guided needle aspiration	— 12
Radio-immuno assays	— 27564

Tests for testosterone, progesterone, growth hormone, free T3, free T4 and cortisol were the newer assays started this year. ¹³¹I therapy for thyroid cancer was started and one patient was treated. CT Scanning was fully utilized during this period. Half of the cases were for body scanning. Seventeen cancer patients of low income group were scanned free of cost. X-ray mammograms showed a considerable increase in number.

Interviews for three posts were held and appointments were made for the post of Professor and two Assistant Professors.

Academic activities :

Training was given to undergraduates, post-graduates and MLT students.

Regular symposia, journal clubs and presentation of interesting cases were done regularly every week.

Regular training in ultrasonography was given to doctors from health services, other government and private institutions.

Dr. K. Sasidharan gave talks on 'CT of Liver Lesions' in the CME Programme at Department of Gastroenterology, Medical College Hospital, Trivandrum on 'Physical energy in diagnosis and treatment in Medicine' in the CME programme by the Life Sciences Chapter of Kerala Academy of Medical Sciences, Medical College Hospital, Trivandrum and on 'Fetal Imaging, at CME by Department of Child Health, S. A. T. Hospital, Trivandrum.

Dr. V. Padmanabhan attended CME Programme in Medical Imaging at Apollo Hospital, Madras from December 28-30, 1990.

Mr. Raghuram K. Nair carried out research work at All India Institute of Medical Sciences, New Delhi from April 3 to May 25, 1990.

Dr. K. Sasidharan and Dr. K. Ramachandran attended training in CT technology and application in Japan from 27th November to 19th December, 1990.

Mr. Reghuram K. Nair attended one week training in the maintenance and handling of Isotope Calibrator at BARC Bombay in March, 1991.

Papers Presented/Published :

1. K. Sasidharan, V. G. Chellam, P. Kusuma Kumary, Krishnan Nair. "Ultrasonographic Features and Pathological Correlation of Wilms tumor" 44th Annual Congress of Indian Radiological and Imaging Association PUNE 10-13, January, 1991.
2. K. Sasidharan, K. Ramachandran, V.M. Pradeep, P. Kusuma Kumary, N. Surendran, M. Krishnan Nair. "Disappearance Interface in Ultrasonography". Ind. Jour. of Rad. and Imaging 44: 169-171, 1990.
3. V. Padmanabhan. 'Quality Control Studies in Gamma cameras; Association of Medical Physicists of India, Kerala Branch Meeting, Calicut, February 10, 1991.
4. Reghuram K. Nair. TC—99m Mag 3: Can it be a viable alternative to TC-99m DTPA? Indian Journal of Nuclear Medicine, 6-1-1991.
5. Reghuram K. Nair., 'Quality Control in Mammography: the evolving pattern over the last decade'. Association of Medical Physicists of India, Kerala Branch Meeting, Calicut, February, 10, 1991.
6. V. M. Pradeep, V. Padmanabhan et al. 'Sonographic evaluation of operability of Malignant cervical lymph nodes'. American Journal of Clinical Oncology (under publication).
7. V. M. Pradeep et al. 'Fetal Goitre — a case detected by ultrasonography'. Journal of Clinical Ultrasound (accepted.)
8. V. M. Pradeep et al. 'Anomalous position of gall bladder - ultrasonographic and scintigraphic demonstration of few cases'. Journal of Clinical Ultrasound (under publication)



Sri. E. K. Nayanar, Hon. Chief Minister, laying the foundation stone of the II Phase Building of the R.C.C. on 14/11/1990, in the presence of Sri A. C. Shanmukhadass, Hon. Minister for Health.



Sri. E. K. Nayanar, dedicated the "Shimadzu" C. T. Scanner, donated by the Japanese Government to the R.C.C. in the presence of Ministers Sri. A. C. Shanmukhadass and Sri. V. Viswanatha Menon on 10/8/1990.

9. V. M. Pradeep. 'Acute Cholecystitis' — need for caution in sonographic diagnosis. Kerala Medical Journal (under publication).
10. V. N. Bhattathiri, K. Sasidharan, L. Sudha, B. Rajasekharan Pillai, A. Sudhakaran, M. Krishnan Nair. 'Intra-oral dental radiology: "A neglected investigation in oral cancer"'. IJR: 1, 59-60, 1991.
11. V. N. Bhattathiri, K. Sasidharan et al. "Periodontal space — Major route of spread to bone in oral cancer". European Journal of Cancer 27 (2): 222, 1991.
12. V. N. Bhattathiri, L. Sudha, Rajasekharan Pillai, A. Sudhakaran, K. Sasidharan and M. Krishnan Nair. "Periodontal invasion in oral cancer". Anti Cancer Research 10: 53, 1448, 1990.

DIVISION OF RADIATION PHYSICS

1. Dr. T. P. Ramachandran : Associate Professor
2. Shri P. G. Gopalakrishna Kurup : Associate Professor
3. Shri C. A. Davis : Assistant Professor
4. Sri T. S. Elias : Lecturer

Patient Services

For patients undergoing teletherapy and brachytherapy treatment planning and related dose computations were carried out routinely. The following numbers of cases were planned during the year.

External Beam Therapy — 52

Brachytherapy

Intracavitary treatment using Selectron Remote Afterloading System — 3

Interstitial Implants — 1

Intracavitary treatment for Carcinoma Oesophagus —

Mould treatment (for Carcinoma Palate, Carcinoma Penis etc) —

Carcinoma Cervix Uteri cases treated with Manual Afterloading: using Caesium-137 —

Treatment using Selectron remote afterloading system for lesions: in the orbit and rectum by using specially fabricated devices —

Plaster of Paris shells were made for patient immobilisation in radical external beam therapy for head and neck cancer. For shielding in mantle treatment for lymphomas, individualised shielding blocks were made using low melting alloy and styroform cutting system fabricated here. Random dose monitoring in the case of patients undergoing external beam therapy was carried out by using TLD chips.

Research activities

The AERB funded research project 'Dose to Thyroid and eyelens in radiotherapy especially in the cases of the cancer of the upper trunk and head and neck regions' continued for this year also.

This division is participating in the Department of Atomic Energy funded project on 'Natural Background Radiation Cancer Registry' with regard to the dose measurements in the area.

Accreditation for Radiological Testing

This laboratory has been accredited by the Dept. of Science and Technology, Government of India for radiological testing and calibration for radiation monitors like area survey instruments, field monitors and personnel monitoring dosimeters and for radiation sources like diagnostic X-ray machines, therapy X-ray machines, Cobalt machines and medical accelerators.

Quality assurance of the following radiotherapy equipments was carried out.

Linear Accelerator	—	1
Cobalt — 60 teletherapy machines	—	2
Radiotherapy Simulator	—	1
Selectron Remote Afterloading System	—	1
Radium Sources	—	603 mgs.
Caesium — 137 sources	—	673 mCi

Routine calibration, checking and quality assurance tests on all the machines were undertaken which ensured proper dose delivery. Due to the routine checks and consequent preventive maintenance in the machines, the downtime was reduced considerably and treatment could be given to the patients without much interruption.

The division is maintaining the necessary instruments for therapy beam calibration, radiation safety surveys etc.

Radiation Safety Activities

Personnel dose monitoring is carried out using film badges for 90 radiation workers of the Regional Cancer Centre, Radiation diagnostic Department of Medical College Hospital, SAT Hospital and Dental College. Radiation Protection Surveys were carried out periodically in therapy machines and brachytherapy sections to ensure safety to radiation workers and the public.

This division extends the necessary physics support to Department of Radiodiagnosis in the Medical College Hospital and SAT Hospital. Acceptance tests of newly installed machines, periodic quality assurance tests, planning of X-ray installations, possible repairs of equipments etc are some of the activities undertaken by the division in this regard.

Academic Programme

Physics teaching and training were imparted to the following categories of students.

M. D. Radiotherapy

M. D. Radiodiagnosis

DMRT, DMRD, CRA, Third Year MBBS, Third year B. Sc Nursing and Third year M. Sc. Nursing.

Training was imparted to one Physicist from General Hospital, Ernakulam for one month and to one student of the M. Sc. Medical Physics course of the Anna University, Madras.

Sri T. S. Elias got registered for Ph.D. in the University of Kerala.

Participation in Workshop/Meeting

1. Sri T. S. Elias participated in the Nucletron Treatment Planning System., Workshop-cum-familiarisation held at MNJ Cancer and Radium Institute, Hyderabad during 23-25 July, 1990.

2. Sri C. A. Davis participated in the Xth International Conference on the use of computers in Radiation Therapy held at the Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow, during November 11-14, 1990.
3. Sri C. A. Davis participated in the Colloquium on Computerised Treatment Planning for developing countries held on November 17, 1990 at the Nanavathy Hospital and Medical Research Centre, Bombay.
4. Dr. T. P. Ramachandran and Sri P. G. Gopalakrishna Kurup participated in the Nucletron Treatment Planning System Workshop-cum-familiarisation held at Cancer Institute, Adyar, Madras held during February 28 to March 3, 1991.

Distinguished Visitors

1. Dr. Edward S. Sternick, Director, Medical Physics Division, New England Medical Centre Hospital, Massachusetts, USA visited this centre on 7th November and gave two lectures on "Quality Assurance in Radiotherapy".
2. J. M. Wilkinson, Principal Physicist, Christie Hospital & Holt Radium Institute, Manchester, U. K. visited this centre and delivered lectures on the following topics on 20th and 21st November 1990.
 - (a) A Prototype Multileaf Collimator System.
 - (b) Specification of a Treatment Planning Computer.
 - (c) High Dose rate Microseletron.

DIVISION OF CLINICAL RESEARCH

- Dr. R. Sankaranarayanan : Associate Professor of Cancer Epidemiology & Clinical Research
- Dr. Cherian Varghese : Assistant Professor of Cancer Epidemiology & Clinical Research
- Miss Aleyamma Mathew : Lecturer in Computational Statistics & Electronic Data Processing

The Regional Cancer Centre, Trivandrum is probably the first comprehensive cancer centre to start a separate clinical research division in India. The broad objectives in initiating this programme are the following:-

1. Assistance in protocol development, implementation, monitoring and evaluation of clinical research programmes including clinical trials.
2. To provide statistical support systems for analysis and reporting.
3. To develop a need oriented clinical audit and hypothesis generation for clinical trials.

This division closely interacts with the hospital tumor registry programme, medical records, clinical department pathology and the National Cancer Database in view of the interactive nature of the objectives. The medical personnel of the division mandatorily spend 30% of their working hours in the clinical services of the centre. It is only the 6th month of existence of this division. During this time specific research proposals have been taken up and implemented.

We have received a grant of Rs. 56,000/- to evaluate chemopreventive potential of Multin, which is a Spirulina Algae extract containing betacarotene, lutein, lycopene, canthoxanthin etc. This project is expected to run for 1½ years. The subjects recruited for the study will be those with oral precancerous lesions; the end points will be complete disappearance of the precancerous lesions, microscopic parameters like the polarity of cells and serum analysis for micronutrients.

We have initiated a randomized clinical trial comparing Adriamycin and its analogue Mitoxantrone in collaboration with the Medical Oncology Division and Cardiology Dept. of Medical College, Trivandrum.

This division has completed two ICMR supported student summer fellowship programmes. The details are as follows:-

1. Evaluation of survival and pattern of failure in cancer of the oral cavity treated with radical radiotherapy with or without concomitant chemotherapy by Mr. Eswar Krishnan, IV Year Medical Student, Medical College, Trivandrum. This project has been completed and a report has been submitted to ICMR. A scientific paper based on the findings has been submitted to "Cancer". The 5 year disease free survival was of the order of 34%.
2. Evaluation of survival and pattern of evaluation in cancer of the breast by Mr. Sukumaran Nair, IV Year Medical Student, Medical College, Trivandrum. The Project report has been submitted to ICMR and a scientific paper based on the findings has been prepared for submission to National Medical Journal of India.

The division had submitted 3 new summer student fellowship programmes to the ICMR for the year 1991-92 which have been approved.

1. Independent prognostic factors and treatment related to survival in multiple myeloma by Mr. Eswar Krishnan, Final Year MBBS Student, Medical College, Trivandrum.
2. Retrospective analysis of the cancer of the Oropharynx and Larynx treated at the Regional Cancer Centre, Trivandrum by Miss O. V. Suma, Final Year MBBS Student, Medical College, Trivandrum.
3. Clinical profile of carcinoma larynx in Kerala by Miss Srividya Bhasker, Final Year MBBS Student, Medical College, Trivandrum.

The work on these projects has already been started. Technical assistance is provided to a study on survival analysis of

cervical cancers sponsored by the National Cancer Database. This will be published as a monograph of cervical cancer in India. This division has started giving active support to research programmes in the Medical College, Trivandrum and other sister institutions. A regular ongoing teaching programme in clinical research and biostatistics is being developed.

Papers published and in print:

1. Epidemiological leads to cancer control in India — Under print— *Cancer Causes and Control*, 1991; 3: 263-265.
2. Pattern of childhood cancer in India — *Lancet* (in print)
3. Independent predictors of response and disease free survival in oral cancer treated with radical radiotherapy — *Cancer*. (in print).
4. Risk factors for cancer of the Oesophagus in Kerala, India. *Int. J. Cancer*. (inprint).
5. Cancer Control Programme in India — Opportunities for implementation and evaluation. *Int. J. Cancer*. (in print)

DIVISION OF RESEARCH

1. Dr. Prabha Balaram : Associate Professor
2. Mr. Thomas Abraham : Scientific Officer
3. Mr. Ravindran Ankathil : Scientific Officer
4. M/s. P. Remani : Lecturer
5. M/s. Mollykutty John : Lecturer

Major activities during the year centred round immunological molecular, biochemical and cytogenetic aspects of cancer.

On the immunological front, the blocking effect of serum from patients with cancer of the oral cavity and uterine cervix and the expression of various cytoskeletal proteins in oral cancer lesions were investigated. The blocking effect of patients serum on autologous lymphocytes was carried out in 100 oral cancer patients and 30 cervix cancer patients. The most interesting features noticed were (1) an enhancing effect of serum from some patients in T lymphocyte rosette formation and leucocyte migration inhibition test and (2) the increase in number of patients with blocking sera in advanced stages of the cancer namely, stage I: 38%, Stage II: 55%, stage III: 63% and Stage IV 63%. The degree of blocking, however, had no correlation with the concentration of reported immunosuppressants such as CIC, ferritin or with the various immunoglobulin levels. The circulating immune complexes (CIC) isolated from these sera invariably showed blocking on these parameters irrespective of the blocker/enhancer status of the sera. This study points towards the presence of immune enhancers in the serum, which is yet to be characterised. Immunohistochemistry using anti cytoskeletal antibodies showed alterations in the expression of cytoskeletal proteins mainly keratin subtypes, vimentin involucrin, laminin and collagen IV. These alterations are to be compared with those in leukoplakia in order to identify markers with potential for early detection of carcinomas.

The potential of plant products as diagnostic agents in cancer diagnosis was explored using a number of locally available seeds and leaves. Jack fruit lectin and peanut lectin isolated earlier in this laboratory from jack fruit seeds and peanut showed differential staining of malignant cells and could be used as one of the markers of cancer cells. These were characterised by intense membrane and cytoplasmic staining, the intensity showing a direct relation to the dose of radiation received. Polysaccharides isolated from the seeds and leaves of *Mangifera indica*, *Tamarindus indica*, *Murraya Koenigii* and *Punica granatum* were found to be bioactive. The polysaccharides isolated from *Mangifera indica*, *Tamarindus indica* and *pericarp of Punica granatum* showed hemagglutinating activity while those from *Tamarindus indica* and *Murraya koenigii* also exhibited enhancement of neutrophil phagocytosis and leucocyte migration inhibition, thus suggesting an immunomodulator activity. In our preliminary experiments with oral cancer patients, the degree of phagocytic enhancement by these polysaccharides appeared to be higher in cancer patients. Estimation of glutathione levels in plasma, whole blood and red cells of oral cancer patients showed an increase in the plasma levels with no variation in the whole blood or red cell levels.

Cytogenetic analysis of Acute lymphoid leukemia (ALL) which had been started last year was continued. The initial bone marrow karyotyping pattern was found to correlate with prognosis and survival pattern of these patients. Patients showing > 51 chromosomes had the best prognosis with a median survival period of 32 months. Those patients with normal karyotype or with the deletion of the long arm of chromosome 11 showed an intermediate prognosis with a median survival period of 18 months. Patients with Ph chromosomes and translocations showed poor prognosis with median survival period of 11 months and 9 months respectively. Patients with trisomy 21, 8 and 13 were associated with the worst prognosis with a mean survival period of 5 months. These results suggest the potential use of karyotyping in the prediction of response to therapy.

Ongoing Projects

Title	Investigators	Agency
1. Epidermal growth factor receptor status as a prognostic indicator - An evaluation	Dr. Jagadeesh Chandran (Research Associate) under Dr. Prabha Balaram	ICMR
2. Cytoskeletal proteins as markers of malignant transformation	Mr. Thomas Abraham Dr. K. Ambika (Dental College) Mr. S. Kannan	DST Govt. of Kerala
3. Characterisation of serum blocking factors in cancer	Dr. Prabha Balaram Dr. T. K. Padmanabhan	ICMR

Ongoing Collaborative Projects

1. Synthesis of anti-tumour peptides	Dr. P. K. Rajan Dr. K. K. Vijayan	DST Govt. of Kerala
2. A clinical and immunological study on corneal transplantation	ICMR Research Associateship. Dr. Vineetha Cheriyan under supervision of Dr. K.P. Kannan Dr. Prabha Balaram Dr. Prasanna	ICMR

Projects Sanctioned in 1991

Title	Investigators	Agency
1. Detection of urinary tumour antigens and development of an ELISA system for its estimation in cancer of the oral cavity and uterine cervix	Dr. Prabha Balaram Dr. P.G. Jayaprakash Dr. S. Parameswaran Dr. K. R. Nalina Kumari	ICMR

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|---|---|-------------------------|
| 2. Effect of vitamins on carcinogenesis by betel quid ingredients | Dr. T. Vijayakumar
Mrs. P. Remani | DST,
Kerala
Govt. |
| 3. Clinical significance of chromosome studies in multiple myeloma patients | Mr. Ravindran Ankathil
Dr. Jayaprakash Madhavan | DST,
Kerala
Govt. |
| 4. Search for oncogenic viruses associated with pre-malignant and malignant lesions of uterine cervix | Dr. T. Vijayakumar
Mr. Ravindran Ankathil
Dr. Elizabeth Abraham | ICMR |
| 5. An evaluation of immunoregulatory proteins as a prognostic indicator in oral cancer | Dr. Prabha Balaram
Mrs. Girija Meenattoor | DST
Kerala
Govt. |
| 6. Search for biological markers in malignant and pre-malignant lesions of oral cavity. | Dr. T. Vijaya Kumar
Mr. Ravindran Ankathil | ICMR |

Paper Published/presented at conferences

1. Prabha Balaram, Radhakrishna Pillai, M. and Padmanabhan, T. K.: Stage related augmentation of depressed immunity by interferon alpha and interleukin-2 in cancer of the uterine cervix. *Biomedicine* 10: 3-8, 1990.
2. Remani, P., Joy, A., Vijayan, K. K., Ravindran, A., Haseena Beevi, V. M., Vasudevan, D. M., and Vijayakumar, T.: Jack fruit lectin binding pattern in carcinoma of the uterine cervix. *J. Exptl. Path* 5: 89-96, 1990.

3. Ravindran Ankathil, Vijayakumar, T., Remani, P., and Krishnan Nair, M.: Sister chromatid exchange frequencies in patients with premalignant and malignant lesions of oral cavity. *Anticancer Res* 10(5) : 1462, 1990.
4. Kannan, S., Kartha, C.C., Prabha, B., Joy, A., Nalina Kumary K.R., Hareendran, N.K. and Krishnan Nair, M.: Evaluation of the potential use of electron Microscopy in early detection of malignant changes in oral leukoplakia. *Proceedings of the 3rd Kerala Science Congress* 241-243, 1991.
5. Girija Meenattoor, Prabha Balaram, Nalinakumari, K. R, Sudha, L., Hareendran, N. K., and Krishnan Nair, M.: Erythrocyte rosetting by CD-2 receptor bearing lymphocytes as a reliable index of immunoregulation in oral cancer patients—A Preliminary report. *Proceedings of the 3rd Kerala Science Congress* 232-233, 1991.
6. Sreelekha, T. T., Vijayan, K. K., Vijayakumar, T. and Paul Sebastian: Search for bio-active Polysaccharides—A preliminary study. *Proceedings of the 3rd Kerala Science Congress*: 250-251, 1991.
7. Radhakrishna Pillai, M., Prabha Balaram, Chidambaram, S. Padmanabhan, T. K. and Krishnan Nair M.: Development of an immunological staging system to prognosticate disease course in malignant cervical neoplasia. *Gynaecologic Oncology* 37: 200-205, 1990.
8. Rajendran, R., Remani, P., Vijayakumar, T. and Vasudevan, D. M.: Total hemolytic complement (CH 50) and its fractions (C3 and C4) in the sera of patients with pre-malignant and malignant lesions of oral cavity. *Annals of Dentistry* 49: 36, 1990.
9. Anil, S., Remani, P., Ravindran Ankathil and Vijayakumar T.: Circulating immune complexes in diabetic patients with periodontitis. *Annals of Dentistry*, 49 (2): 3, 1990.
10. Prabha Balaram, Radhakrishna Pillai, M., Hareendran, N.K., Padmanabhan, T.K., and Krishnan Nair, M.: Concanavalin-A induced suppression as prognostic indicator in cancer of

the uterine cervix. Proceedings of the 3rd Kerala Science Congress, 236-238, 1991.

11. Anil, S., Hari, S., Remani, P., Ankathil, R., and Vijayakumar, T.: Cell mediated and humoral immune responses in patients with localised juvenile periodontitis. Bull. Kanajawa Dental College 18: 3, 1990.
12. Ravindran Ankathil : Chromosome studies in cancer. Proc. Natl. Symp. Appl. Immunol 21-22, 1991.
13. Radhakrishna Pillai, M., Prabha Balam, Hareendran, N.K. Bindu, S., Padmanabhan, T. K. and Krishnan Nair, M.: Clinical and prognostic significance of concanavalin-A induced suppressor cell activity in malignant cervical neoplasia. Brit. J Obstet Gynaecol 97: 357-361, 1990.
14. Anil, S., Remani, P., Vijayakumar, T., and Hari, S.: Cell mediated immune responses in diabetic patients with periodontitis. Oral surg Oral Med Oral Path 70: 44, 1990.
15. Vijayakumar, T. Tumour Markers in Head and Neck Cancer. Proc. 23rd Ker. Dent. Conf., 9-20, 1990.
16. Anil, S., Hari, S., and Vijayakumar, T. Periodontal conditions of a selected population of Trivandrum District Kerala, India. Community Dent. Oral Epidemiol 18: 325-1990.
17. Radhakrishna Pillai, M., Prabha Balam, Kannan, S. Sudha, L., Nalinakumari, K. R., Hareendran, N.K., and Krishnan Nair, M. Clinical implications for oral precancers of interferon activation of latent natural killer cells and alteration in kinetics of target cell lysis. Oral Surg Oral Med Oral Pathol 70 : 458-61, 1990.
18. Raveendran Pillai, K., Remani, P., Joy Augustine, Sreedevi Amma, N., Krishnan Nair, M., and Vijayakumar, T.: Jack fruit lectin as a diagnostic marker in lung cancer. Proc. 3rd Kerala Science Congress 220-231, 1991.

Conferences attended:

1. Prabha Balam: XXIV Annual Convention of the Indian College of Allergy and Applied Immunology, Trivandrum October 1990.
2. Ravindran Ankathil: XX Annual Conference of Indian Academy of Cytologists, Belgaum, October, 1990.
3. Dasan, E. V.: National Symposium on Biotechnology, Cochin, 1990.
4. Remani, P.: XXIV Annual Convention of Indian College of Allergy and Applied Immunology, Trivandrum, 1990.
5. Hasseena Beevi: XXIV Annual Convention of Indian College of Allergy and Applied Immunology, Trivandrum 1990.
6. Hareendran, N.K.: 3rd Kerala Science Congress, Kozhikode, 1991.
7. Ravindran Ankathil. : Xth Annual Convention of Indian Association of Cancer Research, Bombay, 1991.
8. Prabha Balam: 3rd Kerala Science Congress, Kozhikode 1991.
9. Kannan, S.: 3rd Kerala Science Congress, Kozhikode 1991.
10. Girija Meenattoor: 3rd Kerala Science Congress, Kozhikode, 1991.
11. Sreelekha, T.T.: 3rd Kerala Science Congress, Kozhikode, 1991.

Guest Lectures:

1. Thomas Abraham: Lecture on Genetic Engineering at the Inservice Course on Zoology for Government College teachers, Trivandrum, March, 1991.
2. Prabha Balam: Lectures on

- (a) Monoclonal antibodies
 - (b) Molecular biology of Malignant transformation-at the Inservice Course on Zoology for Government College teachers, Trivandrum, March 1991.
3. Prabha Balam: Lectures on
 - (1) Advances in Immunology
 - (2) Monoclonal antibodies and
 - (3) Immune systems and cancer at the Refresher Course for College teachers, Mahatma Gandhi University.
 4. Ravindran Ankathil: Lecture on "Chromosome studies in Cancer". at the National symposium on Applied immunology, Trichur, 1991.
 5. Ravindran Ankathil: Lecture on "Chromosome abnormalities and Cancer — I and II" at the Inservice course in Zoology for Government College teachers, Trivandrum, 1991.
 6. Prabha Balam: Lecture on "Diagnostic procedures in immune deficiency disorders" at the XXIV Annual Convention of the Indian College of Allergy and Applied Immunology, October, 1990.
 7. Prabha Balam: Chairperson of a session on Applied Immunology at the XXIV Annual Convention of the Indian College of Allergy and Applied Immunology, October 1990.

Trainings/Workshops participated

1. Dr. Prabha Balam: 'Workshop on cloning and characterization of Animal genes' at the Department of Biochemistry, Bose Institute; Calcutta, 1990.
2. Dr. Prabha Balam: AMBO International training course on "Detection of DNA Aberrations in Cancer Cells" held at the National Cancer Centre Research Institute, Tokyo, Japan, 1991.

3. Ravindran Ankathil: Indo-US workshop on Molecular Cytogenetics at KMIO, Bangalore, December 1990.
4. Thomas Abraham: Workshop on Flow Cytometry "Complete Cell Analysis" at Bangalore, 1991 (March).

Ph D thesis

1. Biological markers in Squamous Cell Carcinoma.
2. Plant lectins and their binding patterns in human malignant tumours.
3. Immunopathological studies on oral leukoplakia.
4. Immunoregulation in squamous cell carcinoma of the oral cavity.
5. Studies on bioactive polysaccharides.
6. Effect of radiosensitisers on radiation damage.
7. Molecular markers in cancer of the uterine cervix — Oncogene expression.

Clinical Services:

Hematology	—	1,00,200
Biochemistry	—	42,000
Urine, CSF & Others	—	19,800
Serum immunoglobulin	—	120
Cytogenetics (Karyotyping)	—	10
Total number of routine investigations	—	<u>1,62,140</u>

**DIVISION OF MEDICAL RECORDS AND STATISTICS
AND HOSPITAL CANCER REGISTRY (N.C.R.P.)**

Mr. P. Gangadharan	:	Associate Professor
Dr. R. Sankaranarayanan	:	Associate Professor
Dr. Cherian Varghese	:	Senior Research Officer & Assistant Professor
Mr. S. Muraleedharan Nair	:	Medical Statistician
Mr. R. Raveendran Nair	:	Medical Records Officer
Mrs. G. Padmakumari Amma	:	Senior Research Fellow

Medical Records and Statistics

During the year 1990, the new patient registrations numbered 6048, almost 15% more than in 1989, and almost 70% more than in 1982.

The patient statistics for the year 1990 were as follows:

TABLE I
Patient Attendance

Total new registrations	—	6048
New Cancer cases	—	5249
Males	—	2787
Females	—	2462
Sex Ratio	—	1.1 : 1.0
Carcinoma-in-Situ	—	7
Benign Tumours	—	123
Vesicular Mole	—	91
All other & Non-Cancer	—	578
Inpatient admissions	—	3045
Deaths in hospital	—	181
No. of follow-up letters sent	—	3696
No. of Hospital visits by patients (Old + New)	—	43810

The distribution of cancer cases in males and females, sex ratios and percentage microscopically confirmed are given in Table II — Diagram I.

The age and site distribution of cancer cases in males and females are given in Tables III & IV — Diagrams II & III. The microscopic verification of cancer is an important parameter of diagnostic capabilities of the centre. During the year, there was almost 89% histologic verification of tumours. The overall sex ratio was 1.1 : 1.

The maximum frequency of cases was in the 7th decade of life in males and in females the maximum number of cases occurred in the 6th decade. The median age of male cancer cases was 56.5 years and for female cancer cases the median age was 51.7 years. In the 1st and 2nd decades of life, leukaemia, brain cancer and bone cancer were the predominant cancers. In the 3rd decade, leukaemia, lymphoma, brain cancer, Testicular cancer, Thyroid cancer and Bone cancer were prominent cancers in males whereas in females, Breast, Thyroid, Ovary and Brain cancer together formed 60% of all cancer in this age group. In males of other age groups the oral cavity, pharynx and lung become predominant cancer sites and in females the cervix and breast formed the major cancer sites.

Ten leading cancers in males and females are given in Table V.

TABLE V
Ten Leading Cancer Sites in Males and Females. 1990

Site	Male		Site	Female	
	No.	%		No.	%
Lung	346	12.42	Breast	597	24.22
Other Mouth	268	9.62	Cervix	492	19.97
Tongue	231	8.29	Other Mouth	153	6.21
Lymphoma, HD	151	5.42	Ovary	129	5.23
Oesophagus	136	4.88	Thyroid	115	4.67
Leukaemia	129	4.73	Tongue	104	4.22
Larynx	118	4.24	Brain	80	3.25
Oropharynx	117	4.20	Leukaemia	76	3.08
Brain	117	4.20	Lymphoma, HD	59	2.39
Hypopharynx	94	3.38	Oesophagus	52	2.11

Lung cancer was the leading cancer site among males. The number of cancer cases of breast cancer have increased sharply over the years and during 1990 it surpassed the number of cervix cancer cases. Cervix cancer continues to be a leading cancer in females.

Paediatric Cancer Types (0-14 years)

Overall, almost 3.5% of all cancer patients were in the Paediatric age group. Table VI gives the 7 leading paediatric cancer cases.

TABLE VI
Seven leading Paediatric Cancer 1990
0-14 Age Group

Type of cancer	Boys		Type of cancer	Girls	
	No.	%		No.	%
Leukaemia	39	37.1	Brain	22	26.5
Brain	21	20.0	Leukaemia	20	24.1
Lymphoma, HD	12	11.4	Eye	9	10.8
Kidney	6	5.7	Connective		
Bone	6	5.7	Tissue	7	8.4
Endocrine glands	6	5.7	Bone	6	7.2
Connective Tissue	4	3.8	Kidney	5	6.0
			Ovary	5	6.0
Total	94	89.5		74	89.1

All sites 105

All sites 83

89% of all childhood cancers were seen in these seven sites together.

HOSPITAL CANCER REGISTRY

The Hospital Cancer Registry, Medical College Hospital, Trivandrum is a part of the network of 12 cancer registries organised by the Indian Council of Medical Research.

In 1990, the analysis of cancer cases seen in 1988 was reported. During the year 1988, a total of 4745 new cancer cases were registered. The total number of cases had increased to 4745 in 1988 from 3715 cases registered in 1982. The sex ratio of the cases registered was 1.1 : 1. The average age of male patients was 52.9 years and that of female patients was 45.0 years. 88% of the cases were verified microscopically.

Among males the leading cancer sites were lung (10.4%), mouth NOS (10.4%) tongue (6.7%) followed by oesophagus (6.2%). Among females breast cancer was the leading site with 22.3% cases, followed by cervix (22.1%), and ovary (6.3%). Breast cancer was more preponderant in female muslims (23.8%), and christians (22.0%) as compared to hindus (21.9%). Cervical cancer was preponderant in hindu females (24.3%) as compared to muslims (17.7%) and christians (15.9%). Among males other mouth was the preponderant site in hindus and muslims (10.0% and 12.7%). Among Christians, lung is the leading site (15.9%) as compared to hindus (9.7%) and muslims (9.7%). During the year 1988, there were 212 paediatric cancer cases, forming 4.6% of the total new cases. Among these, acute lymphatic leukaemia (25.0%), brain tumours (15.0%), kidney (8.6%), and acute myeloid leukaemia (8.6%) were the leading cancers.

Of the total 4745 cases, 15.7% had received treatment before attending the base hospital and hence were not be evaluated for the extent of the disease. Among the cases evaluated for the extent of the disease, 17.0% were found in localised stages. Of the 4000 analytical cases, 80.7% were treated at the reporting hospital.

ONGOING RESEARCH PROJECTS

Natural Background Radiation Cancer Registry, (NBRR) Karunagappally

This project, funded by the Department of Atomic Energy, Government of India is to study whether there is a higher incidence of cancer in the Karunagappally coastal areas due to the Natural Background Radiation present there.

Dr. P. K. Iyengar, Secretary, Department of Atomic Energy, inaugurated the project on 9th February, 1991. The first phase of the survey is progressing.

A follow-up clinic held every fourth Saturday in the field office of NBRR helps the follow-up examination of cancer patients who hail from the Karunagappally and adjoining taluks. This has helped us to develop better co-operation from the public.

National Cancer Database:

This is a project funded by the Department of Electronics, Government of India. The initial funding is for 3 years. The objectives of the study are to create a database for all cancer related information to be used for cancer control in India. These relate to information on cancer incidence, mortality, treatment facilities, inventory of ongoing clinical and basic research, cancer literature, community anti-cancer programmes etc. In this, the initial effort is to evolve standard data collection formats, computer software, and collection of information on cancer facilities from various centres all over the country etc.

In order to create a database for cervical cancer a proforma was made with elements suitable for a critical appraisal of therapy and survival information and more than 1500 cervix cancer cases have been abstracted using this proforma. The data analysis is being continued.

To create a data base for cancer treatment and research facilities in India, a suitable proforma was devised and mailed to all medical colleges and cancer institutes in the country.

Epidemiologic study of Stomach Cancer

The epidemiologic study of Stomach Cancer is being continued.

Other activities

The Hospital Cancer Registry, Trivandrum continued to publish 'CRAB' the Journal of the National Cancer Registry Programme.



Dr. P. K. Iyengar, Chairman, Atomic Energy Commission, formally inaugurated the Natural Background Radiation Registry, Karunagappally, on 9-2-91.



Dr. P. K. Iyengar (Sitting 4th from left) alongwith the staff of the Natural Background Radiation Registry, Karunagappally.

A booklet for lay public "Questions on Cancer" prepared by Tumour Registry was published in January, 1991.

Institutional visit

1. Mr. P. Gangadharan visited the University of California Medical Centre at San Francisco and other Registries in the United States in January, 1991.

2. Mr. P. Gangadharan visited the Radiation Effects Research Foundation at Hiroshima in February, 1991.

3. Mrs. G. Padmakumary attended the British Council Epidemiology Course of two weeks duration at Cambridge, U.K. during June, 1990. She returned from MRC Biostatistics Unit, Cambridge, U.K. after completion of her fellowship programme.

Conferences attended

Mr. P. Gangadharan attended the Chapter Meeting of the International College of Surgeons in Cochin in January 1991 and presented a paper on "Cancer in South East Asia with special reference to cancer in Kerala".

Mr. P. Gangadharan presented a paper "Cancer in India" in a Seminar in the Medical School, University of California, San Francisco, USA in January, 1991.

Dr. R. Sankaranarayanan attended the Chapter Meeting of the International College of Surgeons in Cochin in January 1991 and presented a paper on "Chemoprevention of Cancer".

Mr. P. Gangadharan gave a talk on "Natural Background Radiation Cancer Registry in Karunagappally, Kerala" at Radiation Effects Research Foundation, Hiroshima, Japan in February, 1991.

The department wishes to thank the following individuals and institutions for their kind advice and support to our studies.

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5. Dr. Stephen Duffy, Medical Research Council, Cambridge, UK.
6. Dr. N. E. Day, Medical Research Council, Cambridge, UK.
7. Medical Research Council, Cambridge, UK.
8. Dr. Calvin Zippin, San Francisco, USA.
9. Dr. John L. Young, California, U.S.A.
10. Dr. Benjamin F. Hankey, National Cancer Institute, USA.

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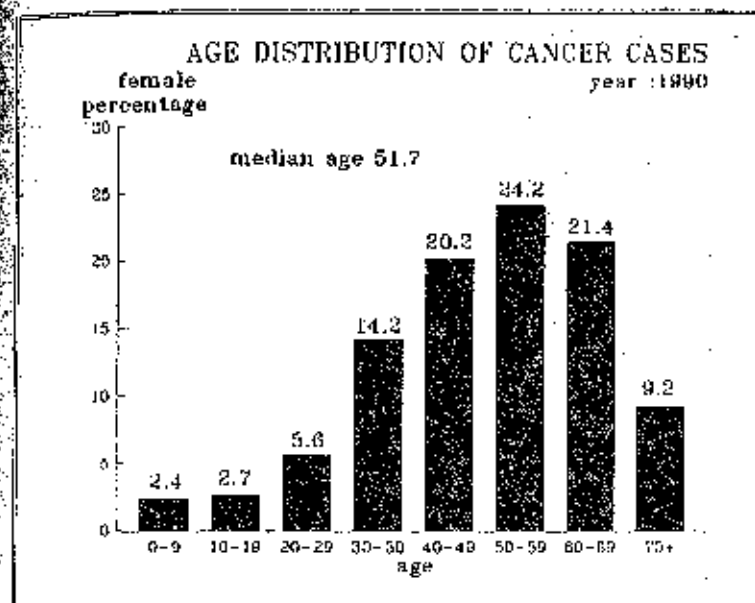
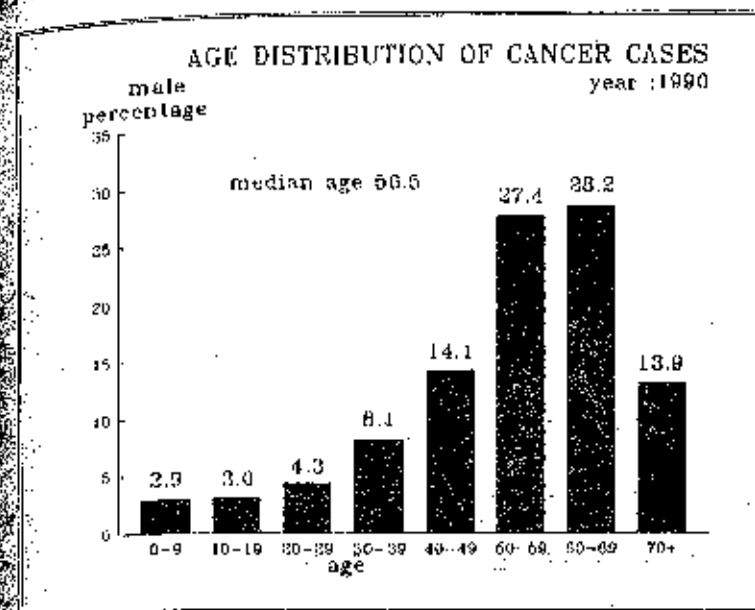


TABLE II

SITE-SITE DISTRIBUTION AND MICROSCOPIC VERIFICATION

ICD-9	SITE	MALE		FEMALE		TOTAL		SEX RATIO	HISTOLOGICAL PROVED CA	
		Total	%	Total	%	Total	%		%	%
140	LIP	22	8.79	14	0.57	36	8.67	1.6:1	53	91.7
141	TONGUE	231	8.29	104	4.22	335	6.38	2.2:1	293	88.1
142	SALIVARY GL.	14	0.50	6	0.24	20	0.38	2.5:1	19	95.0
143	SKIN	69	2.48	39	1.59	108	2.06	1.9:1	98	90.7
144	FLOOR OF MOUTH	25	0.89	3	0.12	28	0.55	9.3:1	26	93.1
145	OTHER MOUTH	268	9.62	153	6.21	421	8.42	1.8:1	351	83.4
146	OROPHARYNX	117	4.28	14	0.57	131	2.58	8.4:1	119	90.8
147	NASOPHARYNX	29	1.04	12	0.49	41	0.78	2.4:1	40	97.5
148	HYPOPHARYNX	94	3.37	13	0.53	107	2.04	7.2:1	96	89.7
149	PHARYNX ETC.	2	0.07	-	-	2	0.04	-	2	100.0
150	ESOPHAGUS	136	4.88	52	2.11	188	3.58	2.6:1	158	84.0
151	STOMACH	87	3.12	35	1.42	122	2.32	2.5:1	92	75.4
152	SMALL INTES.	4	0.14	4	0.16	8	0.15	1.0:1	8	100.0
153	COLON	25	0.98	26	1.06	51	0.97	1.0:1	49	96.1
154	RECTUM	35	1.26	37	1.50	72	1.37	1.0:1	62	84.7
155	LIVER	84	3.01	21	0.85	105	2.08	4.8:1	95	90.5
156	OTHER DIG SYS	4	0.14	1	0.04	5	0.10	4.0:1	4	80.0
157	PANCREAS	38	1.38	18	0.71	56	1.06	3.0:1	22	39.3
158	RETROPERIT.	9	0.32	7	0.28	16	0.30	1.3:1	15	93.8
160	NASAL CAV.	33	1.18	15	0.61	48	0.91	2.2:1	43	89.6
161	LARYNX	119	4.27	4	0.16	123	2.34	29.8:1	112	91.1
162	LUNG	346	12.41	42	1.70	388	7.39	8.2:1	295	76.0
163	PLEURA	6	0.22	2	0.08	8	0.15	3.0:1	8	100.0
164	THYMUS ETC.	9	0.32	-	-	9	0.17	-	9	100.0
170	BONE	26	1.00	20	0.81	46	0.89	1.4:1	46	100.0
171	CONJ. TISS.	48	1.72	37	1.50	85	1.62	1.3:1	82	96.5
172	SKIN, NECK	11	0.39	3	0.12	14	0.27	3.7:1	14	100.0
173	SKIN, OTHER	65	2.35	26	1.04	91	1.73	1.6:1	87	95.7
174	BREAST FEMALE	-	-	507	24.22	507	14.37	-	506	99.6
175	BREAST MALE	5	0.18	-	-	5	0.18	-	5	100.0
179	UTERUS NOS.	-	-	5	0.20	5	0.13	-	5	100.0
180	CERVIX	-	-	492	19.98	492	9.57	-	429	87.2
181	PLACENTA	-	-	3	0.12	3	0.06	-	2	66.7
182	BODY UTERUS	-	-	32	1.28	32	0.61	-	31	96.9
183	OVARY	-	-	129	5.24	129	2.46	-	126	97.7
184	VAGINA	-	-	42	1.70	42	0.80	-	37	88.1
185	PROSTATE	58	2.08	-	-	58	1.18	-	41	70.7
186	TESTIS	27	0.97	-	-	27	0.51	-	27	100.0
187	PENIS ETC.	28	1.00	-	-	28	0.53	-	23	82.1
188	URET. BLAD.	53	1.90	6	0.24	59	1.12	5.9:1	51	86.4
189	KIDNEY	28	0.72	13	0.53	41	0.83	1.5:1	29	69.9
190	EYE	6	0.22	18	0.71	24	0.46	0.4:1	15	62.5
191	BRAIN	117	4.28	81	3.29	198	3.77	1.4:1	156	78.8
192	NERVOUS SY.	7	0.25	2	0.08	9	0.17	3.5:1	9	100.0
193	THYROID GL.	55	1.97	114	4.63	169	3.22	0.3:1	168	98.8
194	OTITIS, GL.	8	0.28	3	0.12	11	0.21	2.7:1	10	90.9
195	ILL. DEF. SIT.	6	0.22	5	0.20	11	0.21	1.2:1	10	90.9
196	SEC. LYMPH. N	53	1.90	11	0.45	64	1.22	6.8:1	60	93.8
197	SEC. RES. ETC.	22	0.79	18	0.71	40	0.76	2.2:1	28	70.0
198	SEC. OTHER	42	1.51	25	1.01	67	1.23	1.7:1	44	65.7
199	PRIM. UNK.	32	1.15	38	1.52	70	1.31	1.1:1	51	72.9
200	LYMPHOSARC.	38	1.38	15	0.60	53	1.01	2.1:1	46	86.8
201	HODGKINS. D.	39	1.40	16	0.63	55	1.05	2.4:1	55	100.0
202	OTH. LYMPH.	82	2.94	28	1.14	110	2.10	2.9:1	104	94.5
203	MULT. MYEL.	48	1.74	13	0.53	61	1.18	3.1:1	49	80.3
204	LEUK. LYMPH.	65	2.37	42	1.70	107	2.06	1.6:1	103	96.3
205	LEUK. MYELO.	63	2.26	31	1.26	94	1.79	2.8:1	93	98.9
208	LEUK. URS.	-	-	3	0.12	3	0.05	-	3	100.0
TOTAL		2787		2162		4949		1.1:1	4624	93.4

TABLE III

CASES OF CANCER BY AGE AND SITE (ICD-9)

MALE

YEAR: 1998

ICD-9	SITE	2-4	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	5	3	13	2	4	2	2	5	3	1	2	22
141	TONGUE	-	-	-	-	2	5	3	13	12	28	31	39	25	48	17	15	231
142	SALIVARY GL.	-	-	1	1	-	-	1	2	1	1	1	2	-	1	2	1	14
143	GUM	-	-	-	-	-	-	-	-	3	5	5	13	12	16	8	7	69
144	FLOOR OF MOUTH	-	-	-	-	-	-	-	-	1	1	4	5	5	5	3	1	25
145	OTHER MOUTH	-	-	1	1	1	1	1	11	9	22	34	45	42	51	21	29	268
146	OROPHARYNX	-	-	-	-	-	-	-	3	6	17	11	24	24	14	10	1	29
147	NASOPHARYNX	-	1	1	2	1	2	3	-	3	2	4	6	3	-	-	-	94
148	HYPOPHARYNX	-	-	-	-	1	-	-	-	1	1	-	-	-	-	-	-	2
149	PHARYNX ETC.	-	-	-	-	-	-	1	1	7	6	25	21	28	38	13	12	136
150	ESOPHAGUS	-	-	-	-	-	-	1	1	7	6	12	13	17	14	8	5	87
151	STOMACH	-	-	-	-	-	-	3	5	4	6	12	13	17	14	8	5	87
152	SMALL INTEST.	-	-	-	-	-	-	-	-	1	-	-	1	1	1	-	-	4
153	COLON	-	-	-	1	-	-	2	2	3	4	2	4	7	5	2	2	25
154	RECTUM	-	-	-	-	1	1	2	3	2	4	2	4	7	5	2	2	35
155	LIVER	1	-	-	2	5	4	4	11	8	9	12	18	7	6	4	-	64
156	GALL BLADD.	-	-	-	-	-	1	-	-	1	1	-	-	1	-	-	-	4
157	PANCREAS	-	-	-	-	-	-	1	3	3	7	2	4	3	4	1	2	30
158	RETROPERIT.	-	-	-	1	1	1	-	-	-	2	-	1	1	1	3	3	9
160	NASAL CAV.	-	-	-	-	1	-	1	2	1	3	5	5	4	5	3	3	33
161	LARYNX	-	-	-	-	-	1	-	1	2	1	3	9	22	24	15	11	119
162	LUNGS	-	-	-	-	-	-	2	12	17	33	48	78	58	58	25	14	346
165	BLADDER	-	-	-	-	-	-	-	-	-	1	-	1	1	2	-	-	6
170	UTERUS ETC.	-	-	1	1	-	-	2	1	1	-	-	-	1	1	1	-	9
171	BONE	-	2	4	6	5	2	2	2	-	1	-	1	1	-	-	2	28
172	SKIN, TISS.	3	-	1	5	1	5	6	5	4	3	4	3	2	1	1	4	48
173	SKIN, MELA	-	-	-	-	-	-	-	1	-	1	2	-	3	1	1	2	11
174	SKIN, OTHER	-	-	-	-	-	-	3	5	1	4	7	4	6	7	2	4	43
175	BREAST MALE	-	-	-	-	-	-	1	-	-	1	1	-	1	-	1	-	5
185	PROSTATE	1	-	-	1	-	-	-	-	-	1	4	4	13	13	13	8	58
186	TESTIS	-	-	-	-	3	7	7	2	1	1	2	1	-	3	-	-	27
187	PELVIS ETC.	-	-	-	-	-	1	2	1	3	-	4	4	5	3	1	4	28
188	URI. BLAD.	-	-	-	-	-	-	1	-	1	3	6	13	8	16	5	8	53
189	KIDNEY	5	1	-	-	-	-	-	1	-	1	2	1	4	2	2	1	28
190	EYE	1	2	-	-	-	-	1	-	2	-	-	-	-	-	-	-	6
191	BRAIN	5	18	6	7	8	5	7	12	7	18	7	14	14	2	3	-	117
192	NERVOUS SY.	1	-	-	3	-	-	1	-	-	2	-	-	-	-	-	-	7
193	THYROID GL.	-	-	-	-	3	5	3	9	3	6	7	6	6	3	1	3	55
194	OTH. ENDO. GL.	4	1	1	-	-	-	1	1	-	-	-	-	-	-	-	-	8
195	ILL. DEF. SPT.	-	-	-	1	-	-	-	-	-	1	-	1	1	1	-	1	6
196	SEC. LYMPH. N	1	-	-	-	-	-	2	4	3	4	7	9	8	7	3	5	53
197	SEC. RES. ETC	-	-	-	1	-	-	1	2	2	2	5	-	6	2	1	-	22
198	SEC. OTHER	-	-	-	-	2	1	2	1	4	3	4	8	18	6	1	-	42
199	PRIM. UNK.	-	-	-	-	-	-	2	-	1	2	3	10	18	2	-	2	32
200	LYMPHOSARC.	-	5	1	2	1	1	1	-	1	3	5	2	2	2	-	4	38
201	HODGKINS. D.	1	3	1	5	3	3	1	4	2	2	5	3	3	-	2	1	39
202	OTH. LYMPH.	-	1	-	3	1	3	4	6	5	7	10	16	9	4	7	6	82
203	MULT. MYEL.	-	-	-	-	-	2	-	2	4	6	3	5	6	8	4	-	48
204	LEUK. LYMPH.	11	15	4	9	6	6	3	3	2	2	-	2	1	1	-	1	66
205	LEUK. MYELO.	4	1	4	7	6	7	7	-	8	7	3	4	2	1	2	-	63
Total		38	42	25	59	53	65	83	142	144	245	327	429	483	374	184	174	2787

TABLE IV

CASES OF CANCER BY AGE AND SITE (ICD-9)

FEMALE YEAR-1992

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	5	1	3	-	2	14	
141	TONGUE	-	-	-	-	3	-	4	3	7	9	11	18	15	13	14	7	184
142	SALIVARY GL.	-	-	-	-	1	-	1	-	2	2	7	8	7	3	7	39	
143	GUM	-	-	-	-	-	-	-	-	-	1	-	1	-	1	-	3	
144	FLOOR OF MOUTH	-	-	-	-	-	-	-	-	-	1	-	1	-	1	-	3	
145	OTHER MOUTH	-	-	-	-	-	-	1	4	18	14	7	31	28	24	16	18	153
146	OROPHARYNX	-	-	-	-	-	-	-	1	-	4	-	1	2	1	3	2	14
147	NASOPHARYNX	-	-	-	-	1	2	2	2	-	-	1	1	1	1	-	3	13
148	HYPOPHARYNX	-	-	-	-	-	1	-	1	1	2	2	1	1	1	-	6	52
150	ESOPHAGUS	-	-	-	-	-	-	-	1	1	3	9	11	6	8	5	6	52
151	STOMACH	-	-	-	-	1	2	2	2	2	6	3	9	5	3	2	-	35
152	SMALL INTEST.	-	-	-	-	-	2	-	-	-	-	1	-	-	-	-	1	4
153	COLON	-	-	-	-	1	3	1	1	2	3	4	4	6	1	-	-	26
154	RECTUM	-	-	-	-	-	-	1	1	1	3	4	7	5	2	7	6	37
155	LIVER	1	-	-	-	1	2	1	2	1	3	2	2	2	3	-	1	21
156	OTHER DIG ST	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1
157	PANCREAS	-	-	-	-	-	-	-	2	-	3	-	2	-	3	-	-	18
158	RETROPERIT.	2	-	-	-	-	-	-	1	1	-	-	2	-	-	-	1	7
168	NASAL CAV.	-	-	-	-	1	1	-	2	2	1	2	2	1	1	1	1	15
161	LARYNX	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1
162	LUNG	-	-	-	-	1	4	2	2	2	3	7	9	8	3	2	-	42
163	PLEURA	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	2
178	BONE	-	3	3	6	-	2	1	1	-	2	-	2	-	-	-	-	28
171	CONN. TISS.	2	2	3	4	6	2	2	2	3	1	2	4	-	2	1	1	37
172	SKIN, MELA	-	-	-	-	-	-	-	-	-	-	-	2	1	-	-	-	3

ICD-9	SITE OTHER	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
174	BREAST	-	-	-	-	1	19	38	66	99	94	88	75	51	37	12	18	297
179	UTERUS NOS.	-	-	-	-	1	-	-	-	1	-	-	2	-	-	-	1	5
180	CERVIX	-	-	-	-	4	15	48	53	64	65	65	84	57	18	27	492	
181	PLACENTA	-	-	-	-	-	2	-	-	1	-	-	-	-	-	-	-	3
182	BODY UTERUS	-	-	-	-	-	-	2	2	3	4	5	7	4	4	1	-	32
183	OVARY	-	2	3	6	8	6	12	15	11	21	11	13	9	7	2	3	129
184	VAGINA	-	-	-	-	-	2	-	1	-	1	8	6	11	7	5	1	42
188	URI. BLAD.	-	-	-	-	-	-	-	1	-	2	-	-	-	-	2	1	6
189	KIDNEY	3	1	1	-	1	2	-	-	-	-	1	-	1	2	1	-	13
190	EYE	6	2	1	-	-	-	-	-	-	-	-	1	-	-	-	-	10
191	BRAIN	4	12	6	4	4	9	9	18	4	5	3	3	4	3	-	1	81
192	NERVOUS SY.	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	2
193	THYROID GL.	-	-	-	3	7	13	11	21	9	18	12	11	7	5	4	1	114
194	OTH. ENDO. GL.	1	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	3
195	ILL. DEF. SITE	1	-	-	-	-	-	-	-	1	-	-	1	1	-	1	-	5
196	SEC. LYMPH.	-	-	-	-	-	-	1	-	-	3	2	1	3	-	1	-	11
197	SEC. RES. ET	-	-	-	-	-	-	1	-	-	1	2	-	3	3	-	-	10
198	SEC. OTHER	2	-	-	-	-	-	2	5	4	4	2	2	1	1	1	2	25
199	PRIM. UNK.	-	-	1	1	-	-	-	3	2	2	3	7	3	4	3	1	38
200	LYMPHOSARC.	-	-	-	1	-	1	-	2	3	-	2	2	2	-	2	-	15
201	HODGKINS. D.	-	-	1	2	2	3	2	1	2	-	1	1	-	1	-	-	16
202	OTH. LYMPH.	-	-	-	1	2	1	3	1	-	3	3	2	7	3	-	2	28
203	MULT. MYEL.	-	-	-	-	-	-	-	1	-	-	2	4	3	1	1	1	13
204	LEUK. LYMPH.	5	18	4	7	2	2	2	2	1	-	-	-	3	3	1	-	42
205	LEUK. MYELO.	-	-	-	4	2	3	1	3	4	3	3	2	4	-	2	-	31
208	LEUK. UNS.	1	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	3
Total		28	32	23	44	48	91	137	213	215	282	271	325	385	221	115	112	2462

DIVISION OF COMMUNITY ONCOLOGY

1. Dr. Babu Mathew : Associate Professor
2. Dr. Ramani S. Wesley : Lecturer

The major objectives of the division were centred round (1) Health Education (2) Professional Training (3) Generation of software for cancer awareness programmes, health education and professional training (4) Training and utilisation of voluntary agencies for cancer survey and surveillance (5) Cancer screening programmes in rural areas (6) Community based epidemiological and interventional research and (7) Maintenance of a supplementary register for precancerous lesions.

Health education

The health education on cancer was carried out through various methods:-

1. Articles in the lay press

3 articles were published in the lay press about cancer and village cancer detection programmes.

1. Crusade against cancer May 1990 The Indian Express
2. Misconceptions about cancer Oct. 1990 Ningsalute Arogyam
3. Chavassery first 'Cancer free' village Dec. 1990 The Indian Express

Programmes through All India Radio

A total of 5 programmes were broadcast through A. I. R., 2 from Calicut station and 3 from Trivandrum station. Special features on cancer survey and surveillance programmes of Chavassery and Kalpatta were broadcast from Calicut station. Dr. Babu Mathew participated in 3 programme broadcast from Trivandrum station, the topics being "Tobacco and Health", "Cancer Prevention Strategies" and "Lifestyles and cancer".

Programmes through Doordarshan

A programme for 20 minutes 'Peoples Participation in Prevention and Control of Cancer at Chavassery' was telecast by Doordarshan in June, 1990 covering the details of the training of volunteers, survey, screening camps and treatment details given to patients of Chavassery. Six new posters were given to Doordarshan on warning signals of cancer and hazards of tobacco, which were telecast as follows:

Training of Voluntary agencies for cancer Survey and Surveillance

The most important activity during the period under report was picking up committed voluntary agencies in rural areas to carry out cancer survey and health education in the village. The training for volunteers was given by specialists from the Centre for identification of warning signals of cancer, to carry out health education on cancer and its prevention, to conduct house to house surveys and antitobacco activities.

The volunteers very successfully completed surveys of 11170 persons in Chavassery and 18074 in Kalpatta. Similar surveys of over 540000 persons are in progress at Puthugie village, Kasarcode, Thirurangadi and Malappuram.

Cancer Awareness Programmes

In addition to the training programmes mentioned above, Cancer awareness classes for 1-2 hours were held for various groups and general public. The details of such awareness programmes are shown in Table No. I.

Professional Training

A batch of 80 house surgeons and junior doctors of Medical College, Calicut, was given one day training on various aspects of Prevention and Control of Cancer on 3rd October, 1990. Two batches of Public Health Nurses were given training on the role of Prevention and Control of Cancer. A batch of about 400 Homeopathic doctors was given orientation on the present

day set up of cancer detection, treatment modalities, cure rate, methods of pain relief in cancer.

Participation in Health Exhibitions

During the period under report this division arranged 13 exhibitions. (See Table No. II). In addition to these we have given our exhibits to schools and voluntary agencies for arranging science exhibitions in several villages.

Generation of Software for Health Education

A book in Malayalam "Pukaelayum Arogyavum" was published by this division. This book was meant to train talented students in the Arts and Science Colleges and to stimulate them to generate health education materials for antitobacco Health Education. A training programme was held in 4 Colleges of Trivandrum district and the students have responded to the training by contributing posters and slogans for anti-tobacco campaigns.

Twelve new posters were developed for displaying in the exhibitions. Several bit notices, and stickers were printed by various voluntary agencies to assist them in their health education programmes.

Cancer Screening Programmes in Rural areas

In addition to the 2 major cancer screening programmes at Chavassery and Kalpetta, this division had participated in Cancer Screening Programmes throughout the State. (See Table No. III)

From our experience it is now clear that only cancer screening programmes with proper awareness and motivation of the beneficiaries by local voluntary agencies alone will help in identifying new cases in localised stages of the disease. The help of local voluntary groups is necessary for not only to motivate an asymptomatic patient for not only to examination, but also to encourage him to take modern treatment of cancer at the earliest opportunity. We are now conducting training programmes for committed voluntary groups in all the districts of Kerala.

Research Activities

A. Ongoing Projects:

Collaborative studies with the environmental carcinogenesis Unit, University of British Columbia, Canada.

This project was started about 5 years ago and 12 studies were taken up and all of them were completed by the end of December, 1990. Six papers in journals 2 chapters in monographs and several papers in international conferences were presented based on the results of these studies.

I. C. M. R. Project on the feasibility of utilising trained Multipurpose Health Workers for Primary and Secondary Prevention of Oral Cancer in Rural areas:

This Project was started in 1988 and meant to utilise health workers for early detection of oral cancer, without any additional incentives and as part of their routine duties. 292 Health workers were given training in July, 1988 on oral cancer and identifications, and for referring all suspected cases to Regional Cancer Centre. The work did not progress as expected, for several reasons. The workers failed to motivate asymptomatic patients to the centre. The males who belong to the high risk group will be out door for work during the visting time of health workers. In spite of the retraining and visits of the specialists to the Primary health centres the health workers were inept in identifying cases and referring them to the Centre.

B. New Projects

1. Preventive Oncology Centre

Preparations are in progress for implementing the four projects sanctioned by the I.C.M.R. for Proventive Oncology. A lesson on "tobacco hazards" to be incorporated in the high school text has been formulated, screened by specialists and finalised. A book on "Hazards of Tobacco" has been prepared and is under publication. For opportunistic multi organ cancer screening work demographic details are being collected from Kazhakuttom Village.

2. Collaborative studies on chemoprophylaxis of Oral Precancerous lesions

The project with the collaboration of the University of Birmingham is submitted and is awaiting clearance from I.C.M.R.

3. For clinical Trial using "Multin" for chemo-prophylaxis of oral Precancerous lesions, M/s. Ambadi Laboratories, Madras has sanctioned Rs. 56,000/-.

Papers Published/Presented in Conferences

Papers Published :

1. H. F. Stich, M. P. Rosin, A. P. Honby, Babu Mathew, B. Sankaranarayanan and M. Krishnan Nair. Pilot intervention studies with carotenoids. Chemistry and Biology. Editors N. I. Krinsky et al. Plenum Press, New York. pp. 313 to 321.
2. H. F. Stich, B. Placic, R. Sankaranarayanan, Babu Mathew and M. Krishnan Nair. Quantitation of chromatin patterns by Image analysis as a predictive tool in chemopreventive trials. Complex Mixers and Cancer Risk. Editors H. Vamio et al. Lyon International Agency for Research on cancer 1990, pp. 151 to 164.
3. Babu Mathew, A. Joseph, T. Mayadevi, K. George Varghese and M. Krishnan Nair. Primary and Secondary prevention of oral cancer using National Service Scheme volunteers. Proceedings of the National Seminar on Oral Cancer, Madras, 1990. pp. 35 to 37.
4. Babu Mathew, Ramani S. Wesly, D. K. Pai, Thomas Cheriyan, K. L. Jayakumar, C. Sreekumar and M. Krishnan Nair. Battle against cancer utilising trained volunteers in rural areas. Proceedings of the Kerala Science Congress. Editor. Balakrishnan Nair, Calicut, 1991. pp. 418 to 419.
5. Ramani S. Wesly, Babu Mathew, N. Sreedevi Amma, Paul Sebastian, P. Sivaramakrishnan, C. Sreekumar and



Prof. V. Gopalakrishna Kurup (P.S.C. Chairman), Hon. Health Minister Sri A. C. Shanmukhadas, Sri V. Divakaran, M.L.A., and Hon. Agri. Minister, Sri V. V. Raghavan, in a meeting at Nedumudi on 28/12/1990 for free distribution of Cancer Care for Life Policies to Agricultural Labourers.



The Cancer Detection Camp at Nedumudi village on 28/12/1990.

M. Krishnan Nair. Utilisation of trained unemployed youth in Community cancer screening programmes using seven warning signals of cancer as a diagnostic tool. *Tropical doctor* (accepted for publication Jan. 1990).

6. Ramani S. Wesly, T. V. Gopalakrishnan and B. K. H. Nair. Leprosy among school children in Trivandrum City. *Indian journal of Dermatology, Venerology and Leprology* 1990, 56: 286-288.

Conference attended and papers presented

1. Babu Mathew. Oral manifestations in AIDS. III National convention of the Indian Academy of Oral Medicine, Bangalore, September, 1990.
2. Babu Mathew, R. Sankaranarayanan, M. Krishnan Nair and H. F. Stich. Vitamin A and Retinoids in chemoprevention of Oral Cancer. III National Convention of the Indian Academy of Oral Medicine, Bangalore, Sept. 1990.
3. Babu Mathew, Ramani S. Wesly and M. Krishnan Nair. Oral Cancer Survey and Surveillance in the rural areas utilising trained youth. III National Convention of the Indian Academy of Oral Medicine, Bangalore, 1990.
4. Babu Mathew. Diagnosis and management of precancerous lesions of oral mucosa. Oncology update, International College of Surgeons, India Section, South Zone, Cochin. December, 1990.
5. K. Ravindran Pillai, Babu Mathew, M. Krishnan Nair and Venugopal P. Menon. Serum lipids, lipid peroxidase and ciruloplasmin levels in premalignant and malignant lesions of oral cavity a preliminary study. III Annual Conference of the Society for Research on Polyunsaturated Fatty Acids, Trivandrum, Dec. 1990.
6. M. Krishnan Nair, Babu Mathew, R. Sankaranarayanan and Ramani S. Wesly. Evaluation of control strategies for tobacco related cancers in Kerala, India. Control of

Tobacco related cancers and other diseases, International Symposium, Bombay, Jan. 1990.

Dr. Babu Mathew was elected as the President of the Indian Academy of Oral Medicine for 1990-91. He was appointed as external referee for the Ph. D. examination of the University of Bombay.

Acknowledgements

We place on record our gratitude to M/s D. Krishnatha Pai, Manager North Malabar Gramin Bank, Chavassery, M. Chathan, Secretary, Indian Red Cross Society, Wayanad Dist., Dr. M. Aboobaker, Asst. Surgeon, Govt. Hospital, Thiroorangedi, M. Somasundaram, Secretary, Social Service League, Medical College, Calicut and D. Damodaran, Manager, North Malabar Gramin Bank, Kasargodu for co-ordinating the training to utilise the volunteers for cancer detection and health education in the rural areas.

TABLE I

Cancer Awareness Programmes					
Sl. No.	Date	Place	Organised by	No. Attended	Type of participants
1	2	3	4	5	6
1.	25 4-90	Palghat	Vivekananda Kendra	35	Community Health workers
2.	31-5-90	V. J. T. Hall, Thiruvananthapuram	Alcohol and Drugs Information centre	300	General public
3.	19-5 90	Thiruvananthapuram	College of Nursing	30	B. Sc. Nursing students
4.	9-6-90	Wadi	Catholic Welfare Association	98	General public
5.	14-7-90	Purathoor Malappuram	Y. M. C. O., Purathoor Malappuram	150	Members of voluntary organisations
6.	5-8-90	Kakkened	Kerala Text Book Printing Press Employees Welfare Association	200	Press Employees
7.	15-8-90	Kalpetta	Indian Red Cross Society	210	Community Volunteers

1	2	3	4	5	6
8.	27-8-90	Mar Ivanious College Thiruvananthapuram	R. C. C. & University Health Centre, Thiruvananthapuram	75	Talented Students
9.	6-9-90	N. S. S. College, Dhanuvachapuram	R. C. C. & University Health Centre, Thiruvananthapuram	75	Talented Students
10.	16-9-90	Attingal	Homeopathic Practitioners Associations	400	Homeopathic Practitioners
11.	17-9-90	Iqbal College, Peringamala	R. C. C. & University Health Centre, Thiruvananthapuram	75	Talented Students
12.	3-10-90	C. M. E., Calicut	N. S. S. Unit, Calicut Medical College	7.	Medical Students
13.	12-10-90	East Fort	Govt. Homeopathic College, Thiruvananthapuram	50	House Surgeons of Homeo- pathic College
14.	5-11-90	Christian College, Kattakada	R.C.C. & University Health Centre, Thiruvananthapuram	75	Talented Students
15.	13-11-90	Pathanamthitta	Miima	40	Secretaries and Presidents of Miima Co-operative Societies
16.	18-11-90	Cannanore	Y's Men's Club, Cannanore	40	Members of Y's men's Club
17.	19-11-90	Cannanore	Press Club, Cannanore	30	Members of Press Club and Media
18.	3-1-91	Sherthalai	Bharath Scouts & Guides	70	Scout Masters & Scout Captains
19.	9-1-91	Attingal	Bharath Scouts & Guides	40	Rovers an Rangers
20.	13-1-91	Kadinamkulam	N. S. S. Unit of University College, Thiruvananthapuram	150	General Public
21.	17-1-91	Patcha Palode	Bharath Scouts & Guides	40	Scout Masters
22.	28-2-91	Parapanangady	Al-JunaAth	65	Anganwadi Workers and Community Volunteers
23.	2-3-91	Koduvally	Arbhudha Niveranasamithi	140	Community Volunteers
24.	3-3-91	Puthego Kasaragode	North Malabar Gramin Bank, Kasargodu	90	Community Volunteers
				2553	

TABLE II
Exhibitions Held

Sl. No.	Date	Place
1.	19-5-90	Valiyathura
2.	31-5-90	V. J. T. Hall, Tvm.
3.	20-5-90	Chavassery
4.	26-5-90	Kazhakulam
5.	5-8-90	Kakkannad
6.	15-8-90	Kalpetta
7.	16-9-90	Aithngal
8.	2-10-90	Kalpetta
9.	3-10-90	Calicut
10.	18-10-90	Chavassery
11.	28-10-90	Nedumudi
12.	3-3-91	Puthoge
13.	9-3-91	Kattanam

TABLE III
Details of Cancer Detection Camps

Sl. No.	Date	Place of Camp	Organised by	Newly detected Cancers	Old cases in recurrence	Pre-Cancers	Total Screened
1	2	3	4	5	6	7	8
1.	2-4-90	Madathura	Milma	1	0	14	200
2.	9-4-90	Prayar	Swathandra Arts & Recreation Club	2	1	16	100
3.	21-4-90	Pattazhi	Y's Men's Club, Pattazhi	5	1	13	260
4.	27-4-90	Othara	Union Club, Othara	2	0	12	205
5.	2-5-90	Quilon	Co-operative Bank, Quilon	2	2	8	250
6.	14-5-90	Valiyathura	B.Sc. Nursing students	1	0	20	38
7.	20-5-90	Chavassery	North Malabar Gramin Bank, Chavassery	10	12	92	731

1	2	3	4	5	6	7	8
8.	26-5-90	Kazhakuttom	Madhya Nirodhana Samithi	0	1	5	30
9.	31-5-90	Malayinkil	Kamaraj Foundation of India	0	0	0	35
10.	9-6-90	Wadi, Quilon	Catholic Welfare Association, Wadi	1	0	7	98
11.	4-8-90	Amaravila	N.S.S. Unit of Medical College, Thiruvananthapuram	0	0	6	80
12.	18-8-90	Vengola	Vengola Panchayat	5	0	19	160
13.	2-10-90	Kalpetta	Indian Red Cross Society	10	7	46	287
14.	7-10-90	Kundara	Y's Men's Club, Kundara	8	0	16	289
15.	27-10-90	Puthanambalam	P.H.C. Puthanambalam & Veyanasala	0	0	32	150
16.	30-10-90	Parvathy Mills, Quilon	Rotary Club, Quilon	0	0	12	90
17.	4-11-90	Kilikolloor	Navajoythi Arts & Sports Club	1	0	3	112
18.	17-11-90	Mannamoola	S. Jyothi Ashramam	1	0	11	60
19.	18-11-90	Chavassery	North Malabar Gramin Bank	3	2	30	153
20.	8-12-90	Thevalli, Quilon	Y's Men's Club of Quilon	3	0	8	130
21.	16-12-90	Sreekariyam	Loyola School	0	0	4	30
22.	19-12-90	Pallithottam, Quilon	Blaze Arts Club, Pallithottam, Quilon	3	1	8	65
23.	28-12-90	Nedumudi	Puthiyodathu Varambinakonam Karshaka Sahakarana Sangam	0	0	21	700
24.	30-12-90	Puthenthoppu	N.S.S. Unit of St. Xavier's College, Thiruvananthapuram	1	0	7	80

1	2	3	4	5	6	7	8
25.	13-1-91	Kadinamkulam	N.S.S. Unit of University College, Thiruvananthapuram	0	0	73	150
26.	16-1-91	Kaithaparambu	Kaithaparambu, Milma	5	0	16	250
27.	3-2-91	Sasthamkotta	N.S.S. of D. B. College	0	0	6	30
28.	17-2-91	Quilon	N.S.S. Unit of T. K. M. Engineering College, Quilon	2	0	27	200
29.	24-2-91	Angengo	Catholic Welfare Society	1	0	2	37
30.	9-3-91	Kattanam	Marthoma Mission Hospital, Kattanam	2	1	25	400
31.	17-3-91	Mainagapally	Navajoythi Arts & Sports Club, Mainagapally	0	0	25	256
				69	28	584	5656

EARLY CANCER DETECTION CENTRE, ERNAKULAM

Dr. B. Syamala Kumari : Cytopathologist

The activities of this centre are centred round the following:

1. Routine Examination of persons.
2. Monthly Cancer Detection Programme among workers of Port Trust.
3. Pap smear test, Fine Needle Aspiration Cytology and other cytology tests.
4. Cancer Detection Camps.
5. Cancer Awareness Programme.

In addition collaborative work with the Cancer Detection Unit of ESI Hospital Udyogamandal and Contributory Health Scheme, JNM Hospital FACT Udyogamandal, were also in progress.

The Centre actively took part in the Health Programme organised by the Health authorities of the District. Thus, exhibits on Cancer Education were kept and explained and leaflets given to the Public in connection with the exhibition conducted by the General Hospital, Ernakulam on 28th, 29th & 30th November, 1990.

A regular Cancer Awareness Programme was started among field workers and staff of P. H. Centres of this District. There has been a significant increase in the number of patients referred from these centres.

A total of 92 camps were conducted all these years and 12 camps during the year under report. This number is in fact less than that of the previous years, but each camp was preceded by an Education Programme given to the voluntary workers of this camp. A regular programme of cancer detection work among workers of Port Trust has been arranged to be conducted monthly or fortnightly. An awareness programme conducted before starting this helped much for getting co-operation in conducting the camp for 8000 workers.

Follow up clinic for cancer patients of this area, treated at RCC Trivandrum was conducted regularly.

A total of 6467 persons underwent Cancer Detection check up during the year under report. A total of 12 camps and 9 awareness programmes were conducted. 198 Cancer Cases were detected and sent for treatment. Of these majority are cervical, oral and breast cancers and 60-70% of them being in the curable stage.

A detailed report on the work and lesion break up is enclosed.

Conference & Seminars attended

1. Sri Sujathan, K., Cytotechnologist attended the Seminar on 'Oncology Update' organised by the International College of Surgeons at Ernakulam on 9th December 1990.

AWARENESS PROGRAMME 1990-91

Sl. No.	Date	Place	Sponsors	Persons attended	Status of participants
1.	31-5-90	Kunnakurudy	Malankara Orthodox Church Medical Mission Hospital	103	81 Layman and Socio medical workers
2.	3/7-90	Primary Health Centre, Vaduvucode	Dist. Medical Officer of health Ernakulam	48	Doctors and field staff of the P. H. Centre
3.	4/6-	P. H. Centre, Ramsamangalam	do-	42	do
4.	10-7-90	P. H. Centre, Chengamanad	do-	36	do
5.	11-7-90	P. H. Centre, Angamaly	do	61	Field staff of Angamaly & Kalady P. H. Centres, Health Supervisors of DMOS office and Junior Doctors of Kalady P. H. Centres.
6.	23-10-90	Early Cancer Detection Centre Ernakulam	Corporation of Kochi	10	Volunteers of Voluntary organisations.
7.	10-11-90	Port Trust Hospital, Cochin	Port Trust Employees Welfare activities	75	Employees of Cochin Port Trust
8.	30-1-91	ECDC, Ernakulam	Kerala Catholic Youth Movement, Alangad	10	Volunteers of Social organisation
9.	6-3-91	ECDC Ernakulam	YWCA Vannappuram	10	Volunteers of Voluntary organisation

RESUME OF WORK DONE 1990-1991

Particulars of work	Centre based	Camp based	Total
Persons screened	5281	1186	6467
Cervical smears	3548 (1127 Follow up)	550	4098
Oral smears	145	19	164
Sputum (No. of Persons)	185	—	185
Fine Needle Aspiration Cytology	518	54	572
Body Fluids	133	—	133
Washing & Lavages	16	—	16
Nipple discharge	20	3	23

(A) Gynaecological Cytology (4098 Nos.)

Sl. No.	Lesion	Centre	Camp	Follow up	Total
1	2	3	4	5	6
1.	Normal	582	264	70	916
2.	Inflammation	1110	191	676	1977
3.	Inflammation with Squamous metaplasia	29	2	23	54
4.	Squamous metaplasia	2	—	—	2
5.	Inflammation with atypical Squamous metaplasia	6	—	—	6

1	2	3	4	5	6
6.	Inflammation with glandular cell hyperplasia	10	—	2	12
7.	Inflammation with reserve cell hyperplasia	17	1	5	23
8.	Inflammation with endocervical regeneration	2	—	2	4
9.	Inflammation with Squamous Cell atypia	—	1	—	1
10.	Autolytic strophic changes	1	—	—	1
11.	Hyperkeratotic cervix	10	—	5	15
12.	Hyperkeratotic cervix with inflammation	8	—	—	8
13.	Inflammation with atypical glandular cells	17	6	3	26
14.	Granulomatous inflammation	—	1	1	2
15.	Mild dysplasia	5	—	4	9
16.	Moderate Dysplasia	3	—	—	3
17.	Severa dysplasia	1	—	2	3
18.	Inflammation with mild dysplasia	51	4	26	81
19.	Inflammation with moderate dysplasia	2	—	5	7
20.	Inflammation with severe dysplasia	3	—	2	5
21.	Inflammation with squamous metaplasia and mild dysplasia	6	—	5	11

1	2	3	4	5	6
22.	Fungus infection	21	6	3	30
23.	Fungal infection with mild dysplasia	1	—	3	4
24.	Trichomonas infection	377	65	243	685
25.	Trichomonas infection with mild dysplasia	58	5	21	84
26.	Trichomonas infection with moderate dysplasia	9	—	6	15
27.	Trichomonas infection with severe dysplasia	4	1	1	6
28.	TV and Fungal infection	3	1	—	4
29.	TV with endocervical atypia	7	—	5	12
30.	Leptothrix	7	—	—	7
31.	Herpes simplex infection	1	—	—	1
32.	Herpes with moderate dysplasia	1	—	—	1
33.	Herpes with severe dysplasia	—	—	2	2
34.	Endometrial hyperplasia	1	—	—	1
35.	Atypical endometrium	4	—	—	4
36.	Carcinoma in-situ	3	—	2	5
	MALIGNANCIES (39 Nos)				
	Squamous Carcinoma (37)				
a)	Moderately differentiated Squamous Cell Carcinoma	18	—	2	20
b)	Well Differentiated Squamous Cell Carcinoma	9	—	—	9

1	2	3	4	5	6
e)	Poorly differentiated Squamous Cell Carcinoma	8	—	—	8
38.	Adenocarcinoma	—	—	2	2
39.	Suspicious of malignancy	5	1	2	8
40.	Radiation changes	1	—	1	2
41.	Miscellaneous lesions	18	1	3	22
	Total	2421	550	1127	4098

NON GYNAECOLOGICAL CYTOLOGY

Oral (164 Cases)

Sl. No.	Lesion	Centre	Camp	Total
1.	Non Malignant lesion	52	2	54
2.	Inflammatory lesion	11	2	13
3.	Fungus	1	—	1
4.	Leukoplakia	32	8	40
5.	Laukoplakia with atypia	9	4	13
6.	MALIGNANCIES (20 Cases)			
	Squamous Cell Carcinoma	26	—	26
7.	Verucous Carcinoma	2	—	2
8.	Suspicious of malignancy	6	2	10
9.	Radiation Changes	3	—	3
10.	Miscellaneous	1	1	2
	Total	145	19	164

Sl. No.	Lesion	Centre	Camp	Total
SPUTUM—(185 Nos)				
1.	Non Malignant lesions	127		
2.	Fungus	3		
3.	Atypia	8		
4.	Suspicious of malignancy	11		
5.	Miscellaneous	3		
MALIGNANCY (33 Cases)				
6.	Squamous Cell Carcinoma	24		
7.	Adenocarcinoma	4		
8.	Anaplastic Carcinoma	4		
9.	Giant Cell Carcinoma	1		
Total		185		

III. ASPIRATIONS

(A) BREAST (294 Cases)

1.	Benign lesions	199	18	217
2.	Malignancy	49	—	49
3.	Recurrence	Nil	—	—
4.	Miscellaneous	22	1	23
5.	Suspicious of malignancy	4	1	5
Total		274	20	294

Sl. No.	Lesion	Centre	Camp	Total
(B) Thyroid (93 cases)				
1.	Benign lesions	76	8	83
2.	Malignancy	6	—	6
3.	Suspicious of malignancy	2	1	3
4.	Miscellaneous	—	1	1
Total		83	10	93
(C) Lymphnode (80 Cases)				
1.	Benign lesions	14	2	16
2.	Granulomatous lymphadenitis	28	4	32
3.	Malignancy: Primary - 2 Secondary - 25	27	—	27
4.	Suspicious of malignancy	2	—	2
5.	Miscellaneous	3	—	3
Total		74	6	80
(D) Other sites (105 Cases)				
1.	Benign	68	17	85
2.	Malignancy	16	—	16
3.	Suspicious of malignancy	2	—	2
4.	Miscellaneous	1	1	2
Total		87	18	105

Sl. No.	Lesion	Centre	Camp	Total
(E)	Ovarian Cyst Aspiration No malignant cell	1	—	1
IV. Body Fluids				
(a)	Ascitic Fluid No Malignant cells	49	—	49
	Malignancy	7	—	7
	Miscellaneous	1	—	1
	Total	57		57
(b)	Pleural fluid No malignant cells	56	—	56
	Malignancy	12	—	12
	Suspicious of malignancy	2	—	2
	Miscellaneous	1	—	1
	Total	71		
(c)	CSF : No malignant cells	4	—	4
(d)	Bile : No malignant cells	1	—	1
V. Washings and Lawages				
(a)	Bronchial Washings (16 Cases) No Malignant Cells	14	—	14
	Suspicious of malignancy	1	—	1
	Miscellaneous	1	—	1
	Total	16		16
VI. Nipple Discharge				
	No Malignant cells	20	3	23

EARLY CANCER DETECTION CENTRE, PALGHAT

Dr. R. Ananda Kamath : Medical Officer

This Centre completes 5 years of its existence in April, 1991. As in the previous years it continued all the activities undertaken during the last year with the objectives of early detection of cancer, creation of cancer awareness in the community and extension of therapy to all curable cancers and pain relief for all incurable cancers. Routine work in the Centre included examination of persons who came voluntarily or referred from other institutions, collection and processing of smears, giving suitable guidance to cases diagnosed as cancer and follow-up of some treated cancer cases and advanced cancer cases. In some, chemotherapy was also given. Organisation of cancer detection camps with the aid of voluntary organisations were also undertaken. At these, screening was done, cervical smears were taken on all women above 20 years and from suspicious lesions in other cases, clinically suspicious cases were referred to RCC. Cancer cases attending these camps were also given necessary advice. A small talk was also given at the beginning, relating to cancer awareness. Separate cancer awareness talks were also given.

The details of activities undertaken during the last year are being presented in tabulated forms. A noteworthy activity in this year has been a survey held in May/June '90 at Kallepully and neighbouring villages with the help of Vivekananda Medical Mission. First a training was given to volunteer investigators (32 persons) by Dr. Babu Mathew, Head, Community Oncology Division on 25-4-90 and they went to the houses in a Village around Kallepully for survey and individual houses were visited and details collected in the proforma form 27-4-90 to 8-5-90. A total of 4300 persons were surveyed (Male 1932, Female 2368) of which 68 persons were suspected to have malignant or pre-malignant lesions and were asked to attend the cancer detection camp on 12-5-90. The survey results are with community oncology division for analysis. This was followed by a cancer detection camp held at a School at Kallepully on 12-5-'90.

Only seven cancer detection camps were held during this year, due to various constraints.

Acknowledgements

Thanks are due to Dr. C. D. Anto, DMOH, Palakkad, for deputing Medical Officers and vehicles for the camps and to voluntary organisations for organising the cancer detection camps and cancer awareness programmes.

TABLE I
RESUME OF WORK DONE DURING THE YEAR
1990-1991

	Male	Female	Total	Ca.Cases
Total number of persons screened in the centre	477	362	839	50
Number of smears taken for Cytological examination	363	311	674	41
Total number of persons screened in the camp	169	393	562	16
Number of smears taken for cytological examination	33	183	216	6
Total Number of Smears taken	396	494	890	
Total number of Biopsy sent for HPE				34
Total number of known cancer cases and suspected cancer cases in the Camps				26
Number of Cancer patients referred to R.C.C. Trivandrum				77
Number of cancer patients referred to M.C.H. Calicut				21
Number of Cancer patients referred to other Institutions				15
Total number of referred Cases				113

TABLE II

Break up of Cytologically detected lesions 1990-1991

Specimen	Centre	Camp	Carcinoma		Total
			Centre	Camp	
Cervix	234	162	20	4	396
Buccal	107	43	9	1	150
Sputum	292	..	6	..	292
Breast	19	5	1	1	24
Fluid	5	..	..	..	5
Others	17	6	5	..	23
Total	674	216	41	6	890

TABLE No. III

Analysis of Cervical Smears 1990-91

	Centre	Camp	Total
1. Normal	36	37	73
2. Inflammation	122	83	205
3. Hyperkeratotic Cervix	—	1	1
4. Inflammation with squamous metaplasia	23	12	35
5. Trichomonas vaginalis Infection	8	5	13
6. Inflammation with reserve cell Hyperplasia	6	5	11

	Centre	Camp	Total
7. Inflammation with Glandular cell Regeneration	7	1	8
8. Herpes infection	—	1	1
9. Inflammation with Mild Dysplasia	2	3	5
10. Inflammation with Squamous Metaplasia and Mild dysplasia	3	1	4
11. Mild Dysplasia	—	2	2
12. Moderate Dysplasia	1	—	1
13. Carcinoma in situ	1	—	1
14. Invasive squamous cell carcinoma	15	3	18
15. Malignant cells	4	1	5
16. Suspicious of Malignancy	5	1	6
17. Unsatisfactory samples	1	6	7
Total	234	162	396

Non-Gynaecological 1990-91

	Centre	Camp	Total
I. Oral			
No Malignant cells	86	37	123
Phemphigus infection	1	—	1
Suspicious of Malignancy	11	5	16
Malignant cells	9	1	10
Total	107	43	150

	Centre	Camp	Total
II. Sputum			
No Malignant Cells	269	—	269
Malignant Cells	3	—	3
Squamous cell carcinoma	2	—	2
Adenocarcinoma	1	—	1
Atypical cells and suspicious of Malignancy	11	—	11
Unsatisfactory Samples	6	—	6
Total	292	—	292
III. Breast			
No Malignant Cells	10	3	13
Malignant Cells	1	1	2
No Cells	8	1	9
Total	19	5	24
IV. Pleural Fluid			
No Malignant Cells	5	—	5
Total	5	—	5
V. Others			
No Malignant Cells	10	6	16
Malignant Cells	5	—	5
Suspicious of Malignancy	2	—	2
Total	17	6	23

TABLE IV — DETAILS OF CAMPS CONDUCTED IN 1990-91

Sl. No.	Date	Place	Sponsored by	No. of participants	Smear Taken	No. of Biopsies	Known Cancer cases	Clinically Diagnosed ca. cases	Cytologically Diagnosed ca. cases	Suspected ca. cases
1.	12-5-90	Kalleapully	Vivekananda Medical Mission	61	24	—	—	1	—	3
2.	23-8-90	Ottapalam	Rotary Club of Ottapalam	49	20	3	—	5	4	1
3.	30-9-90	Pirayiri	Leo Club of Palghat	45	20	—	—	—	—	2
4.	6-10-90	Mayurtha Road	N.S.S. Unit, Govt. Victoria College, Palghat	35	9	—	—	—	—	—
5.	7-10-90	Palakkad	Womens Unit of Juma-at-e-Islami, Palakkad	165	68	4	—	2	—	3
6.	14-10-90	Kalladikod	Priyadarsani Arts & Sports Club, Kalladikode	152	62	2	—	—	1	—
7.	29-11-90	Koppum	Cultural and Charitable Organisation, Koppum	55	23	—	7	2	1	4
TOTAL				562	216	7	7	10	6	13

TABLE No. IV
LIST OF CANCER AWARENESS PROGRAMMES IN 1990-91

Sr. No.	Date	Place	Sponsored by	Nature	Number of Participants
1.	19-4-90	Pudussery	P. H. Centre, Pudussery	Talk	75
2.	25-4-90	Marutha Road	Vivekananda Medical Mission, Palghat	Training of Field Workers	32
3.	27-4-90 to 8-5-90	Kallaeppully, Kottaekadu	"	Field Survey	4300
4.	3-2-91	Kanjikode	Panchayat Saksharatha Samithi, Pudussery	Exhibition	200

DIVISION OF LIBRARY & INFORMATION SERVICES

Mr. M. Chandrakumaran Nair : Librarian

The research and clinical activities of the Centre is effectively supported by the library and information division which is being organised in its full-fledged form. With the appointment of a Senior Librarian during the period under report, efforts are being made for strengthening the library's collection and organisation of library and information services. A Library Committee has been constituted with Director as Chairman which is meeting periodically to consider all matters concerning the development of the library and its functioning. As on 31st March 1991, the Centre's Library has a collection of 2130 books, 350 bound volumes of periodicals, 350 reprints and reports and receives about 70 journals which include most of the important foreign journals on Oncology. Efforts are underway for the technical processing of documents using Dewey Decimal Classification 20th ed, AACR II and Medical Subject Headings (MeSH). The Centre is in the regular mailing list of various national / international agencies and institutions related to Oncology and its allied areas. Inter-institutional loan arrangements have been made with the neighbouring libraries like Medical College Central Library, SCTIMST Library, British Library and Centre for Development Studies Library. Facilities are provided for reprographic services, reprint service, and other reference services in the library. MEDLINE search facilities are also being provided by mail service from MEDLARS Centre, New Delhi regularly on demand. As the price of books and journals have been rising at a phenomenal rate of about 20 to 25% per annum, the accepted policy is to build up the collection on its core subject areas of interest and the need for peripheral areas may be met by participation in the resource sharing programmes. In addition to internal users, the library is being utilised by the staff members of neighbouring institutes and other research workers.

SPECIAL CLINICS (Multi disciplinary)

In addition to the routine clinics and morning clinics, the following special clinics with the active participation of faculty members from other departments were conducted regularly.

- I. Paediatric Oncology — All Mondays at 12 noon. Resource persons from other departments. Dr. V. G. Chellam, Professor of Paediatric Pathology, Dr. Mani Ninan, Director & Professor of Paediatric Surgery, Dr. N. Surendran, Professor of Paediatric Surgery.
- II. Head and Neck Clinic — All Tuesdays 12 Noon. Resource persons — Staff of E. N. T.
- III. Trophoblastic tumour clinic — All Wednesdays 12 Noon. Resource persons — Dr. K. Lalitha, Director and Professor of Obst. & Gynaecology.
- IV. Clinicopathological Conference — on 1st Saturday of every month at 11.30 A.M. Resource persons — Dr. M. A. Aleykutty, Professor of Pathology & Other staff of Department of Pathology.
- V. Pain Clinic — All Thursdays at 1 P.M. (Conveners) — Dr. Gladys Jeevy., Dr. Paul Sebastian and Dr. Francis V. James.

SYMPOSIA AND SEMINARS

During the year under report due to certain constraints we were unable to conduct many seminars and symposia. However the following noteworthy seminars were conducted.

I. Medical Physics:

- (a) A 2 day Seminar on "Quality assurance in Radiotherapy was conducted on 6-11-1990 and 7-11-1990, with Dr. Edward. S. Sternick, Director, Medical Physics, Dept. of Radiation Oncology, New England Medical Centre Hospital, Massachusetts, U.S.A. as faculty member.

- (b) A Two day Seminar was conducted on "Prototype Multileaf Collimator System and" Specifications of a Treatment Planning Computer and High Dose Rate Microelectron, on 20-11-1990 and 21-11-1990 by Dr. John Wilkinson, Principal Physicist Christie Hospital Manchester, U. K.

II. Management of Pain

Miss. Gillian Burn, W.H.O., Consultant on Cancer Pain conducted Seminars on Cancer Pain and Palliative Care on 11-3-1991. She also conducted a 2 days Teaching programme for nurses on "The Management of patients with advanced cancer".

**CONFERENCES/SEMINARS/TRAINING/WORKSHOPS
ETC ATTENDED BY VARIOUS STAFF**

1. Dr. V.P. Gangadharan
Asst. Prof. of Medical
Oncology AIP Kerala Chapter; Cochin -
April 1990
2. Mr. Thayal Singh Elias
Lecturer in Radiation
Physics International Symposium on Phy-
sics of Medical Imaging and
Advances in Computer Appli-
cation, Hyderabad, July, 1990.
3. Dr. V.P. Gangadharan
Asst. Prof. of Medical
Oncology Southern Regional Conference of
API; Kodaikanal, August, 1990.
4. Mr. Thomas Abraham
Scientific Officer
Cancer Research C.C.M.B. Hyderabad, September
1990.
5. Dr. Babu Mathew
Assoc. Prof. of Com-
munity Oncology III National Convention of the
Indian Academy of Oral Medicine,
Bangalore, September, 1990.
6. Dr. Cherian Varghese
Lecturer, Medical
Oncology VI Annual Conference of the
Association of Radiation Onco-
logists of India, Coimbatore,
October, 1990.
7. Dr. Prabha, B.
Asso. Prof. of Cancer
Research XXIV I. C. A. I. Annual Con-
vention, Trivandrum, October,
1990.
8. Mr. K. Raveendran Pillai
Cytotechnologist XX Annual Conference of
Indian Academy of Cytologists,
Karnataka; October, 1990.
9. Mr. Raveendran Ankathil
Scientific Officer
Cancer Research -do-

10. M/s. Molykutty John
Cytotechnologist -do-
11. Dr. N. Sreedevi Amma
Prof. of Cytopathology -do-
12. Dr. B. Chandralekha
Asso. Prof. of Cytopa-
thology -do-
13. Dr. P. G. Jayaprakash
Asso. Prof. of
Radiotherapy 10th International Conference on
the use of Computers in Radiation
Therapy (X. ICCR), Lucknow,
November, 1990.
14. Mr. C. A. Davis
Asst. Prof. of Radiation
Physics -do-
15. Dr. K. S. Thomas
Lecturer in Radiotherapy -do-
16. Mr. P. G. Gopalakrishna
Kurup
Asso. Prof. of Radiation
Physics -do-
17. Dr. T. P. Ramachandran
Asso. Prof. of Radiation
Physics -do-
18. Dr. P. G. Jayaprakash
Asso. Prof. of Radio-
therapy Computerised Treatment Plan-
ning System in Radiation Therapy
for Developing Countries, Bombay
November, 1990.
19. Mr. C. A. Davis
Asst. Prof. of Radiation
Physics -do-
20. Dr. K. Ramachandran
Lecturer in Imageology Training in Computed Tomoph-
graphy, Japan, November, 1990.

21. Dr. Prabha Balaram Workshop on Cloning and characterisation of Animal Genes, Calcutta 1990.
22. Dr. Babu Mathew Asso. Prof. of Community Oncology Oncology Update by international College of Surgeons, Indian Section, South Zone, Cochin, December, 1990.
23. Dr. Paul Sebastian Asst. Prof. of Cancer Surgery -do-
24. Mr. K. Raveendran Pillai Cytotechnologist Symposium on Biological Oxidation and Poly unsaturated fatty acids, Trivandrum, December, 1990.
25. Mr. Raveendran Ankathil Scientific Officer Cancer Research Indo-U.S. Workshop on Molecular Cytogenetics in Human Neoplasms, Bangalore, December, 1990.
26. Mr. C. A. Davis Asst. Prof. of Radiation Physics International Seminar on Frontiers in Imaging, Trivandrum, December, 1990.
27. Dr. P. Kusumakumary Asst. Prof. of Paediatric Oncology Indo-U.S. CME in Medical Oncology, Bangalore, December, 1990.
28. Dr. V.P. Gangadharan Asst. Prof. of Medical Oncology -do-
29. Dr. Jayaprakash Madhavan Asst. Prof. of Radiotherapy National Conference, Oncology 91 of Indian Society of Oncology and CME, Gwalior, January, 1991.
30. Dr. Francis V. James Lecturer in Radiotherapy -do-
31. Dr. Thomas Cherian Asso. Prof. of Cancer Surgery -do-

32. Dr. Paul Sebastian Asst. Prof. of Cancer Surgery -do-
33. Dr. P. Kusumakumary Asst. Prof. of Paediatric Oncology -do-
34. Dr. K. Ramadas Asst. Prof. of Radiotherapy -do-
35. Dr. B. Rajan Asso. Prof. of Radiotherapy -do-
36. Dr. K. Sasidharan Asso. Prof. of Imageology Annual Congress of IRIA Poona, January 1991.
37. Dr. N. Sreedevi Amma Prof. of Cytopathology Symposium and Workshop as Colposcopy and cervical lesions, Coimbatore, January, 1991.
38. Dr. N. Sreedevi Amma Prof. of Cytopathology CME Programme on Nodular lesions of Thyroid, Kottayam, January, 1991.
39. Mr. R. Raveendran Nair MR & CSO Computer in Hospital Workshop, Bombay, February, 1991.
40. Dr. Francis V. James Lecturer in Radiotherapy XII Congress of Association of Radiation Oncologist of India, Chandigarh, February, 1991.
41. Dr. Thomas Cherian Asso. Prof. of Cancer Surgery Breast Cancer Seminar & Workshop on Head & Neck Cancer, Bombay, February, 1991.
42. Dr. Paul Sebastian Asst. Prof. of Cancer Surgery -do-

44. Dr. V. N. Bhattathiri
Asst. Prof. of Radiotherapy
1st Conference of Indian Society of Radiotherapy and Indo-Japanese Symposium on Radio-modifiers, New Delhi, February, 1991.
45. Dr. Prabha, B.
Asso. Prof. of Cancer Research
AMBO International Training Course, Japan, March, 1991.

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6. Krishnan Nair, M., Sankaranarayanan, R., Mathew, B., Stich, HF: Dietary intervention in cancer. *Int. Discip Res Rev*, 1990, 1: 5-10.
7. Sasidharan, K., Ramachandran, K., Pradeep, V. M., Kusumakumary, P., Surendran, N., Krishnan Nair, M: Disappearing interface in ultrasonography. *Ind. J. Rad Imaging*. 1990, 44: 169-171.

8. Kannan, S., Kartha, C.C., Prabha, B., Joy, A., Nalinakumari, K.R., Hareendran, N. K., Krishnan Nair, M.: Evaluation of the potential use of electron microscopy in early detection of malignant changes in oral leukoplakia. Proceedings of the Kerala Science Congress, Feb-March 1991, 241-243.
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11. Reghuram K. Nair: TC-99m Mag 3: Can it be a viable alternative to TC-99m DTPA? Indian Journal of Nuclear Medicine 1991, 6, 1.
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ADMINISTRATION

MEMBERS OF THE GOVERNING BODY OF THE REGIONAL CANCER CENTRE SOCIETY THIRUVANANTHAPURAM

1. Sri E. K. Nayanar : Chairman
Chief Minister of Kerala
2. Sri A. C. Shanmukhadass : Vice Chairman
Minister for Health
Government of Kerala
3. Sri M. S. Joseph : Alternate
Secretary to Govt. Vice Chairman
Health & Family Welfare Dept.
4. Sri M. Mohankumar : Member
Commissioner & Secretary to Govt.
Finance Department
5. Sri V. Krishnamurthy : Member
Secretary to Govt., Planning Dept
6. Secretary to Govt. : Member
Union Ministry of Health &
Family Welfare, Govt. of India or
his nominee
7. Director General of Health : Member
Services, New Delhi or
his nominee
8. Dr. S. C. Gupta : Member
Director
Vikram Sarabhai Space Centre
Thiruvananthapuram
9. Dr. M. S. Valiathan : Member
Director,
Sree Chitra Thirunal
Inst. of Medical Science & Technology
Thiruvananthapuram

10. Dr. Aysha Guharaj : Member
Director of Medical Education
Thiruvananthapuram
11. Dr. V. K. Jayapalan : Member
Principal
Medical College,
Thiruvananthapuram
12. Dr. K. R. Harilal : Member
Principal,
Medical College, Kottayam
13. Dr. M. Krishnan Nair : Convener
Director
Regional Cancer Centre
Thiruvananthapuram

**MEMBERS OF THE EXECUTIVE COMMITTEE OF THE
REGIONAL CANCER CENTRE SOCIETY**

1990-1991

1. Shri M. S. Joseph, : Chairman
Secretary to Govt.
Health & Family Welfare Dept.
2. Sri M. Mohankumar : Member
Commissioner & Secretary to
Govt., Finance Department
3. Sri V. Krishnamurthy : Member
Secretary to Govt.
Planning Department
4. Dr. Aysha Guharaj : Member
Director of Medical Education
Thiruvananthapuram
5. Dr. V. K. Jayapalan : Member
Principal, Medical College,
Thiruvananthapuram
6. Dr. M. Krishnan Nair : Convener
Director,
Regional Cancer Centre
Thiruvananthapuram

**BUILDING COMMITTEE MEMBERS OF THE REGIONAL
CANCER CENTRE, THIRUVANANTHAPURAM**

1. Sri M. J. Mathew, : Chairman of the Build-
Chief Engineer, P.W.D., ing Committee upto
Buildings & Local Works, 5/9/90
Trivandrum
- Sri K. Madhavan Pillai, : -do- continuing
Chief Engineer, P. W. D.
Buildings & Local Works
Trivandrum.
2. Sri Thomas Panicker, : Member
Chief Architect,
P.W.D., Trivandrum
3. Dr. Aysha Guharaj, : Member
Director of Medical Education,
Trivandrum
4. Dr. V. K. Jayapalan : Member
Principal,
Medical College,
Trivandrum
5. Dr. M. Krishnan Nair, : Member
Director,
Regional Cancer Centre,
Trivandrum
6. Sri K. R. Bhaskaran Nair, : Member
Finance & Accounts Officer,
Regional Cancer Centre,
Trivandrum
7. Sri. G. Ravindranathan Nair, : Convener
Project Engineer,
Regional Cancer Centre,
Trivandrum

**MAJOR DECISIONS OF THE GOVERNING BODY OF
THE REGIONAL CANCER CENTRE DURING
THE YEAR 1990-91**

The governing body resolved that the recruitment rules of the Regional Cancer Centre as approved by the Governing Body and issued as Govt. Order shall continue as recruitment rules of the RCC with regard to Academic posts. The Governing Body also resolved to reiterate in the service rules that the Society shall observe statutory reservations strictly in such recruitment and to record in the service rules that the RCC shall give preference to internal candidates in recruitments through open advertisement if everything else are equal.

The Governing Body resolved to agree in principle for the construction of an additional building (II phase building of the RCC Master Plan) at a cost of Rs. 4.5 crores. Since the resource position of the RCC was not fully clear due to non-finalisation of the VIII Plan, the Governing Body resolved to authorise the Executive Committee to estimate the resources of the Centre during the VIII Plan period and sanction a construction programme. It was also resolved that the construction shall be started during the financial year itself with the funds available for capital investment.

The Governing Body resolved to handover to the Medical College, Trivandrum the space vacated by National Cancer Registry and Regional Cancer Centre Laboratories in the Medical College block of the Regional Cancer Centre.

The Governing Body resolved to felicitate Dr. M. S. Valiathan who was awarded the Padma Bhushan on the 3rd of June, 1990 under the Chairmanship of the Hon'ble Chief Minister.

The Governing Body resolved to approve the Annual Report of the RCC Society for the year 1989-90 with the comments of the Commissioner and Secretary to Govt. (Finance) as such and resolved to approve the budget proposals for 1991-92 and revised estimates for 1990-91.

**MAJOR DECISIONS OF THE EXECUTIVE COMMITTEE
DURING THE YEAR 1990-91**

The Executive Committee resolved:

- (i) Purchase Theratron 780°C Telecobalt Therapy Unit and Cobalt 60 source and to dispose the radium source available.
- (ii) Participation of Dr. M. Krishnan Nair, Director in the preparation of W. H. O. Manual of Radiotherapy at Hamburg, West Germany.
- (iii) Dr. M. Krishnan Nair, Director to serve as a member of Scientific Advisory Board of I.C.M.R., New Delhi.
- (iv) Dr. K. Sasidharan, Prof. of Imageology and Dr. K. Ramachandran, Asst. Prof. of Imageology to undergo training in C. T. Scanner in Japan.
- (v) Shri P. Gangadharan, Asso. Prof. of Cancer Epidemiology (Statistics) to accept fellowship and visit Cancer Research Centre, San Francisco, U.S.A. and the Radiation Research Foundation at Hiroshima, Japan.
- (vi) Dr. Prabha Balam, Assoc. Prof. of Cancer Research to attend AMBO International Conference on Detection of DNA abberations in Cancer.
- (vii) Smt. G. Padmakumari Amma, Senior Research Fellow to accept WHO Fellowship award and visit U. K.
- (viii) Dr. B. Rajan, Assoc. Prof. of Radiotherapy to be Hon. Consultant in Radiotherapy in Sree Chitra Thirunal Institute of Medical Science and Technology, Trivandrum.
- (ix) Dr. M. Subhadra, Prof. of Anatomy, Medical College, Trivandrum being appointed as Honorary Consultant in Genetics.

The Committee also resolved to purchase 8 equipments and to sanction various additional posts for augmentation of Clinical Laboratory, Medical Oncology, Imageology, Surgical

Pathology Services, Computational Statistics and Electronic data processing.

The Committee also resolved to permit Dr. V. Padmanabhan, Assoc. Prof. of Nuclear Medicine, Dr. Gladys Geevi, Anaesthetist, Dr. K. Ramachandran, Lecturer in Imageology, Shil Raghunathan Nair, Cytologist, Smt. Padmavathy Amma, Senior Technician to join in the Regional Cancer Centre Service.

The Committee also resolved to create a few posts if necessary and make special recruitment to these posts to satisfy the requirement on the statutory reservation of SC/ST Categories. It was resolved to invest the C.C.L. funds to the tune of Rs. 5 lakhs and Rs. 10 lakhs in the Unit Trust of India and CANFIN HOME LIMITED respectively.

It was resolved to give away Cash awards of Rs. 500 each to Shri K. Thankappan Chettiyar and Shri A. Rajayyan (Helpers) in appreciation of their exemplary services.

ENGINEERING DEPARTMENT

This department can feel proud of having finished the first phase of the Building construction, in a record time last year, so that it could be fully commissioned towards the end of 1990, to the best satisfaction of all concerned. Immediately it was decided to embark on the 2nd phase of construction, as proposed and envisaged in the master plan of the Regional Cancer Centre. This was felt very necessary because of the difficulties experienced in physical separations of the OP and I.P. and treatment rooms etc which are at present in far flung places. Further this will enable to release back the five wards and other places occupied by the R.C.C., to the Medical College, which will be mutually beneficial.

The II phase building of the centre is proposed to be constructed as 3 tower blocks in 8 floors and another block in 5 floors.

One block will serve as a link block between the OP department and the proposed I.P. wards, facilitating easy transport of men and materials. The Second block, nearly 2400 sq. mts., is mainly intended for the Research Division and in addition will accommodate the utilities, clinical laboratories, postoperative care ward, library etc.

The third block, nearly 12,000 sq. mts. will accommodate, the I.P. wards, operation theatres and ancillary laboratories etc., besides residential accommodation in a tandem fashion.

Another block, a 5-storeyed building with a floor area of 3000 sq. mts., will provide Radiotherapy and connected facilities, (linear accelerator, interstitial and intracavitary brachytherapy, simulator etc., rooms) and office rooms for radiotherapists, physicists and technicians.

The foundation stone for the 2nd Phase of Construction was laid by Shri E. K. Nayanar, Hon'ble Chief Minister of Kerala on 14th November 1990 at a function presided over by Shri A.C. Shanmukhadas, Hon'ble Minister for Health & Family Welfare. Dr. I. S. Gulathi, Vice-Chairman, State Planning Board, Dr. G.

Balamohanam Thampi, Vice-Chancellor, University of Kerala and Dr. Aysha Guharaj, Director of Medical Education made felicitations.

Piling work for the main building started in August 1990, M/s. Coastal Foundations (P) Limited, Ernakulam are doing the piling work at an estimated cost of Rs. 45 lakhs. It is expected that the piling work will be completed by the end of June, 1991. Construction of the superstructure will start from July, 1991. The Project is to be completed in 3 years when it will be ready for occupation.

Two floors of the O.P. Block had to be extended, one floor to accommodate equipment expected from the Japanese Govt., which will arrive in 1991-92. The other floor form extension of the O.P. services in order to reduce the over crowding in the present O.P. This floor will also house a clinical lab., Blood Bank, a small cafeteria and doctors common room.

Civil work estimated at Rs. 30 lakhs will be completed by end of July, 1991. Electrification, Airconditioning, False ceiling work etc., costing about Rs. 10 lakhs is also expected to be completed simultaneously.

The Building Committee which controls the construction activities of the Project met seven times during the year under report to discuss planning and implementation of the Project during the current year.

Sri G. Ravindrenathan Nair, came back as Project Engineer in April, 1991, Sri R. Asokan Nair, First Grade Overseer joined in January 1991.

ACCOUNTS

1990 - 91

REGIONAL CANCER CENTRE

(Regn. No. 67/81)

BALANCE SHEET AS ON

SOCIETY, THIRUVANANTHAPURAM

(Regn. No. 67/81)

31ST MARCH, 1991

Figures as on 31-3-1990		Rs. Ps.	
LIABILITIES			
CAPITAL FUND			
As per Last Balance Sheet	4,73,02,557.60		
<i>Add:</i> Transfer of Capital			
Grants from State Govt.	79,71,483.52		
From Central Govt.	1,27,04,766.00		
4,73,02,558	Transfer of Donation	Nil	
			6,79,78,807.12
OTHER SPECIFIC FUNDS			
			55,890.46
CAPITAL GRANTS :			
1) From Government of India, Ministry of Health & Family Welfare			
a) Vide Ltr. No. 22015/3/90R dt. 27-3-91 Dupt. of Health			
	20,00,000.00		
b) Vide Ltr. No. DOZ-35011/1/88 MG (Vol III) under Indo-Japanese Grant in aid agreement received in Kind			
	1,20,00,000.00		
			1,40,00,000.00
<i>Less:</i> Amount utilised for acquiring Hospital Equipments, transferred to Capital Fund			
	1,27,04,766.00		
			12,95,234.00
Nil	Balance Unutilised part transferred and shown under utilised Grants	12,95,234.00	Nil
4,73,02,558			6,80,34,487.67

Figures as on 31-3-1990		Rs. Ps.	
ASSETS			
6,87,08,060	FIXED ASSETS		7,25,73,981.21
8,25,316	Machinery at Site	Nil	
—	CAPITAL WORK IN PROGRESS		28,77,815.29
INVESTMENTS			
a) Term Deposit in respect of CCL Programme with various Banks			
		1,40,77,214.00	
b) Can Fin Homes Ltd.			
		10,00,000.00	
c) Unit Trust of India			
		6,00,000.00	
d) In CCL-Non-operational account with Banks			
		2,89,427.55	
1,10,09,980			1,58,66,641.55
—	INVESTMENTS MATURED	1,81,700.00	
—	Term Deposit-Suspense	15,105.00	
			1,76,895.00
2,09,116	DEPOSITS		2,14,469.00
CURRENT ASSETS, LOANS & ADVANCES			
Closing Stock of Medicines, Chemicals, Eng. items etc.			
6,40,950		10,06,111.29	
1,11,089	Interest Accrued on Deposits	1,69,713.85	
6,70,000	Grant Receivable	Nil	
5,484	Income Tax Deducted at Source	7,383.00	
—	Prof. Tax-Excess Paid	1,419.00	
ADVANCES			
Considered good			
		16,31,834.40	
Doubtful			
		16,363.00	
10,65,978	Considered	18,47,197.40	
—	ADVANCE FOR PROJECTS	3,01,585.85	
7,12,99,878		31,13,410.39	9,17,09,762.06

REGIONAL CANCER CENTRE

(Regn. No.

BALANCE SHEET AS ON

SOCIETY, THIRUVANANTHAPURAM

667/81)

31ST MARCH, 1991

Figures as on
31-3-1990

LIABILITIES		Rs.	Ps.
4,73,02,658	Balance Brought Forward	6,80,34,497.67	
	2) From Govt. of Kerala Capitalised as per Income and Expenditure Account	87,95,899.52	
	<i>Less:</i> Amount Utilised for acquiring Equipments and construction of Building transferred to Capital Fund	87,95,899.52	
Nil			Nil
	3) Donation Received for Purchase of Capital Assets As per last Balance Sheet	84,000.00	
	<i>Add:</i> Received during the year	10,000.00	
		94,000.00	
84,000	<i>Less:</i> Equipment purchased and transferred to NTR project	55,000.00	
			39,000.00
UNUTILISED GRANTS			
	1) For putting up Cobalt therapy unit from the Government of India As per last Balance Sheet	54,00,000.00	
	<i>Less:</i> Amount utilised and transferred to Capital Fund during the year 1989-90	20,00,000.00	
		34,00,000.00	
	II) For Cancer Control Programme No. 2 (235)/89 TDID dt. 14-12-1989	3,80,000	
	<i>Less:</i> Amount Utilised during 1990-91	3,80,000	
		Nil	
4,73,86,663		34,00,000.00	6,80,73,497.67

Figures as on
31-3-1990

ASSETS		Rs.	Ps.
7,12,39,878	Balance Brought Forward	31,13,410.39	9,17,09,782.06
	Sundry Debtors	1,95,462.00	
287	Stamps on hand	Nil	33,08,862.39
	CASH ON HAND (including Imprest of Rs. 6,550/- at various centres)		88,656.65
9,922			
	BALANCE WITH BANKS		
	a) State Bank of Travancore MC Br.		
11,72,583	b) Indian Overseas Bank, Pattom	1,42,690.00	
4,83,699	c) Kerala State Co-op. Bank	6,32,738.28	
9,35,180	d) Canara Bank, Puthenchanthai	17,462.15	
19,84,039	e) Govt. Treasury, Trivandrum	45,46,213.00	53,39,101.43
			20,00,000.00
	CASH IN TRANSIT		
INCOME & EXPENDITURE ACCOUNT			
	As per last Balance Sheet	40,35,543.22	
	<i>Add:</i> Excess of Expenditure over Income as per Income and Expenditure Account	40,53,510.47	
		80,89,053.69	
	<i>Less:</i> Cancer Care for Life Scheme— Balance of Income over Expenditure account as per last B/a.	20,31,214.56	
	<i>Add:</i> Excess of Income over Expenditure of CCL Scheme	7,03,852.81	
		27,35,167.37	
7,58,25,848	Balance Brought Forward	53,53,896.32	10,24,46,382.52

REGIONAL CANCER CENTRE
(Regn. No.
INCOME AND EXPENDITURE ACCOUNT

SOCIETY, THIRUVANANTHAPURAM
567/81)
FOR THE YEAR ENDED 31ST MARCH, 1991

Figures as on 31-3-1990	EXPENDITURE	Rs. Ps.
3,72,816	To Opening Stock of Medicine, Films, Chemicals etc.	6,40,950.00
21,31,664	.. Purchase of Medicines, Films, Chemicals etc.	30,73,227.00
33,52,834	.. Salaries, Wages & Allowances	51,36,126.28
27,532	.. Consultation Service Fee	57,100.00
24,337	.. Uniform	34,956.30
8,250	.. Rent, Rates & Taxes	25,345.00
1,10,829	.. Postage, Telegram & Telephone	1,53,916.00
1,10,862	.. Printing & Stationery	1,63,667.00
1,92,311	.. Travelling Expenses	1,72,386.70
55,045	.. Advertisement Charges	1,12,700.00
4,07,960	.. Electricity Charges	6,05,695.00
8,500	.. Legal Expenses	5,500.00
	.. Remuneration to Auditors	
10,000	For Audit	8,500.00
	For Tax Representation	1,500.00
		10,000.00
	.. Repairs & Maintenance	
5,23,363	Equipments	5,52,240.90
86,646	Buildings	2,11,784.90
1,06,093	Vehicles and Others	2,76,695.35
		10,40,721.15
	.. New Building Inauguration & Shifting Expenses	Nil
93,853	.. Interest & Bank Charges	14,59,128.00
15,44,335	.. Service Contract Charges	1,95,210.00
91,68,230		1,28,86,628.43

Figures as on 31-3-1990	INCOME	Rs. Ps.
	BY GRANT RECEIVED	
	From Government of Kerala, Health and Family Welfare Department.	
	a) 1st Instalment as per Letter No. GO/Rt. 1524/90 H&FWD dt. 10th May 1990	42,00,000.00
	b) IInd Instalment as per Letter No. GO/Rt. 2494/90 H&FWD dt. 7th Aug. 1990	45,00,000.00
	c) IIIrd Instalment as per Letter No. GO/Rt. 3302/90 H&FWD dt. 3rd Jan. 1991	50,00,000.00
	d) IVth Instalment as per Letter No. GO/Rt. 598/91 H&FWD dt. 25th Feb. 1991	58,25,000.00
	e) Vth Instalment as per Letter No. GO/Rt. 1025/91 H&FWD dt. 27th March 1991	11,47,000.00
		2,06,72,000.00
	Less: Part of the Grant Capitalis- ed and transferred to Capital Fund Representing the cost of Hospital Equipments acquired and for construction of Building	79,71,483.52
		1,27,00,516.48
67,85,742		1,27,00,516.48

REGIONAL CANCER CENTRE

(Regn.

INCOME AND EXPENDITURE ACCOUNT

Figures as on 31-3-1990	EXPENDITURE	Rs. Ps.
91,68,230	Balance Brought Forward	1,28,86,629.43
50,933	To Conference, Seminars & Workshop	52,981.25
---	.. Computer Expenses	8,941.50
1,02,907	.. Books & Periodicals	38,425.10
---	.. Early Cancer Detection Centre Expenses	---
3,29,308	.. Salaries & Allowance	4,71,147.60
51,481	.. Travelling & Other Expenses	47,004.75
---	.. Proportionate Share of National Tumour Registry Project	6,18,152.35
1,19,088	.. Miscellaneous Expenses	1,38,342.00
67,880	.. Provision for Stationery	1,10,348.85
---	.. Provision for Depreciation	63,305.00
---	.. Prior Period Expenses	78,04,047.31
---		5,381.00
98,89,807	TOTAL	2,16,26,472.89

Sd/-
Director
Regional Cancer Centre
Trivandrum-11

SOCIETY, THIRUVANANTHAPURAM

(No. 567/81)

FOR THE YEAR ENDED 31ST MARCH, 1991

Figures as on 31-3-1990	INCOME	Rs. Ps.
67,85,742	Balance Brought Forward	1,27,00,516.48
16,74,204	By Investigation Fee	39,24,634.50
37,205	.. Interest Received	1,31,553.92
3,750	.. Cytotechniclon Course Fee	2,876.00
7,000	.. Fee on Ultrasonography Training	11,000.00
---	.. Computer Application Course	1,800.00
45,577	.. Miscellaneous Receipts	63,108.15
---	.. Closing Stock of	---
---	Films	63,943.00
---	Chemicals	1,28,298.60
---	Medicines	4,06,426.00
---	Other Surgical Instruments	1,38,896.77
8,40,950	.. Excess of Expenditure over	7,37,474.37
6,25,379	.. Income transferred	40,53,510.47
99,89,807	TOTAL	2,16,26,472.89

Vide our Report of even date attached
For SANKAR & MOORTHY
Chartered Accountant

Sd/-
H. KRISHNAMOORTHY
Partner

**REGIONAL CANCER CENTRE SOCIETY,
CANCER CARE FOR
INCOME AND EXPENDITURE ACCOUNT**

**THIRUVANANTHAPURAM (Regn. No. 576/81)
LIFE SCHEME
FOR THE YEAR ENDED 31ST MARCH, 1981.**

Figures as on 31-3-1980	EXPENDITURE	Rs. Ps.
47,139	To Salaries & Allowances	48,317.00
10,570	.. Advertisement & Publicity	19,000.00
21,782	.. Processing of Application Forms Mailing Cards etc.	17,884.00
56,324	.. Cost of Return of Unused Application Forms	24,079.00
31,758	.. Printing & Stationery	41,083.00
—	.. Postage & Telephone	7,184.00
1,212	.. Travelling Expenses	—
13,417	.. Maintenance of Motor Vehicles	16,252.95
1,07,137	.. Cost of Medicines and Expenses re-imbursed to patients	3,35,419.00
430	.. Miscellaneous Expenses	1,214.00
6,95,379	.. Excess of Income over Expenditure	7,03,862.81
9,84,148	TOTAL	12,14,785.76

Sd/-
Director
Regional Cancer Centre
Trivandrum-11.

Figures as on 31-3-1980	INCOME	Rs. Ps.
12,660	By Sale of Application Forms	—
9,71,298	.. Interest on Fixed Deposits and other investments	12,14,785.76
9,84,148	TOTAL	12,14,785.76

Vide our Report of even date attached
For SANKAR & MOORTHY
Chartered Accountants

Sd/-
H. KRISHNAMOORTHY
Partner

REGIONAL CANCER CENTRE

(Regn. No.

Schedule of Fixed Assets

Description of Assets	GROSS BLOCK			
	Cost as on 1-4-1990	Additions	Sales/ Adjustments	Cost as on 31-3-1991
	Rs. Ps.	Rs. Ps.	Rs. Ps.	Rs. Ps.
Building (Old)	8,60,110.25	—	—	8,60,110.25
Building	2,23,93,884.47	3,31,223.00	—	2,27,25,107.47
Boundary Wall	1,27,118.63	—	—	1,27,118.63
Water Supply	9,03,999.00	89,905.00	—	9,93,904.00
Furniture & Fixtures	11,52,904.02	4,23,479.17	—	15,76,383.19
Office Equipments	1,09,883.90	1,89,292.00	2,250.00	2,96,925.90
Telephone Equipments	5,15,695.00	2,21,319.00	—	7,37,014.00
Hospital Equipments	1,78,92,884.02	1,37,12,002.55	—	3,16,04,886.57
Electrical Installation & Fittings	59,93,872.90	1,61,108.00	—	61,54,980.90
Air Conditioning	—	59,77,346.35	—	59,77,346.35
Computer (Hardware)	—	1,95,525.00	—	1,95,525.00
Vehicles	4,38,492.95	—	—	4,38,492.95
Library Book	1,96,340.55	2,00,365.45	—	3,96,706.00
Lift/Elevator	4,89,480.00	—	—	4,89,480.00
Air Conditioning (under Installation)	56,33,400.35	—	56,33,400.35	—
Total	5,67,08,066.04	2,15,01,565.52	56,35,650.35	7,25,73,981.21

Note: Air conditioning costs Rs. 56,23,384.65 has been shown as additions during the year as the same was not taken for depreciation purposes in the previous year.

Note: A sum of Rs. 123 lakhs and Rs. 80 lakhs have been utilised till 31-3-1991 on purchase of Hospital and Laboratory Equipments and construction of Building respectively out of the Grant in aid Received from Central Government.

SOCIETY, THIRUVANANTHAPURAM

567/81)

as on 31st March, 1991.

Description of Assets	DEPRECIATION BLOCK			NET BLOCK	
	Upto 31-3-1990	Additions	Total upto 31-3-1991	As on 31-3-1991	As on 31-3-1990
	Rs. Ps.	Rs. Ps.	Rs. Ps.	Rs. Ps.	Rs. Ps.
Building (Old)	1,61,486.25	34,931.00	1,96,417.25	6,63,693.00	6,98,624.00
Building	11,19,349.68	10,80,287.89	21,99,637.57	2,05,25,469.90	2,12,74,534.79
Boundary Wall	12,393.63	5,736.00	18,129.63	1,08,989.00	1,14,725.00
Water Supply	1,35,600.00	1,28,746.00	2,64,346.00	7,29,558.00	7,68,399.00
Furniture & Fixtures	2,26,539.12	1,34,984.07	3,61,523.19	12,14,860.00	9,26,364.90
Office Equipments	60,828.90	35,415.00	96,243.90	2,00,682.00	49,055.00
Telephone Equipments	77,354.00	98,949.00	1,76,303.00	5,60,711.00	4,38,341.00
Hospital Equipments	98,22,385.02	43,56,500.55	1,41,78,885.57	1,74,26,001.00	80,70,499.00
Electrical Installation & Fittings	8,99,080.90	7,88,385.00	16,87,465.90	44,67,515.00	50,94,792.00
Air Conditioning	—	8,96,601.35	8,96,601.35	50,80,745.00	—
Computer (Hardware)	—	78,210.00	78,210.00	1,17,315.00	—
Vehicles	1,34,597.95	60,779.00	1,95,376.95	2,43,116.00	3,03,895.00
Library Book	1,15,951.55	42,113.45	1,58,065.00	2,38,641.00	80,389.00
Lift/Elevator	73,422.00	62,409.00	1,35,831.00	3,53,649.00	4,16,058.00
Air Conditioning (under Installation)	—	—	—	—	56,33,400.35
Total	1,28,38,989.00	78,04,047.31	2,06,43,036.31	5,19,30,944.90	4,38,69,077.04

Sd/-

Director
Regional Cancer Centre
Trivandrum-11.

For SANKAR & MOORTHY
Chartered Accountants

Sd/-
H. KRISHNAMOORTHY
Partner

SANKAR & MOORTHY
Chartered Accountants

Telephone : 68356
Gandhari Amman Coil Street
Trivandrum-695 001

The Governing Body,
Regional Cancer Centre Society,
Rogn. No. 567/81,
Thiruvananthapuram.

AUDIT REPORT

We have examined the books of accounts of REGIONAL CANCER CENTRE SOCIETY, Rogn. No. 567/81, THIRUVANANTHAPURAM for the year ended 31st March, 1991 and report that the Balance Sheet as at 31st March, 1991 and the Income and Expenditure Account annexed thereto for the year ended that date together with the Notes attached thereon, which we have signed under reference to this report, are correct and are in agreement with the books of accounts and other records kept by the Society so far as it appears from our examination subject to the following:

1. Internal Control in respect of Fixed Assets, Stores and Engineering Items are not commensurate with the size and magnitude of the Society.
2. Provision for doubtful advances amounting to Rs. 15,363/- has not been made in the accounts as referred to in Note No. 11.
3. Accounts relating to various Research Projects remain unaudited for which an advance of Rs. 3,74,700/- has been received from ICMR/Other Government Departments.
4. Allocation of Grant of Rs. 206.72 Lakhs received from Government of Kerala between Capital and Revenue at Rs. 79.72 Lakhs and Rs. 127.00 Lakhs respectively, on the basis of the addition to Fixed Assets made during the year 1990-91 as referred to in Note No. 5.
5. a) Land at Pulayankotta measuring 17 Acres in Sy. No. 2122, assigned by the Government of Kerala vide order No. GO/MS-1054/22/RD dated 17-11-1982 has not been brought to the accounts for want of clear document of Title as referred to in Note No. 8.
6. The balance in "CCL Fund" and the Investments made thereof in earlier years has not been reconciled. The difference in respect of above amounting to Rs. 15,105/- has been shown as Term Deposit Suspense as referred to in Note No. 8.

7. An amount of Rs. 1,27,119/- booked under buildings, included in Fixed Assets representing the cost of construction of boundary wall at ECDC Palghat around 69 Cents of land assigned to Regional Cancer Centre Society vide GO, B19/88-RD dated 28-7-1988 for which the receipt of Patta in favour of the Society is yet to be obtained as referred to in Note. 7.

For SANKAR & MOORTHY
Chartered Accountants

Trivandrum,
28-10-1991.

Sd/-
H. KRISHNAMOORTHY
Partner

Remarks of the Regional Cancer Centre on the points raised in the Audit Report.

1. The remarks are noted. Internal control procedures will be strengthened.
2. Out of Rs. 15,363/- a decree in favour of R. C. C. to realise an amount of Rs. 15,000/- has been obtained from Court. The execution petition filed in accordance with the decree is now under the consideration of the Court.
3. In future, it will be ensured that Investigators of the Research Projects get their accounts audited, by the prescribed authority.
4. No remarks.
5. Action is pursued with revenue authorities to get documents of Title of the property.
6. The difference of Rs. 15,105/- will be verified and reconciled.
7. Action is pursued with revenue authorities to get patta of the land.

Sd/-
DIRECTOR

**Regional Cancer Centre Society, Trivandrum
NOTES FORMING PART OF ACCOUNTS**

1. Unprovided Depreciation amounting to Rs. 1,28,38,989/- has been brought to the accounts during the year under review. For the year 1990-91, rates applicable as per Schedule XIV of the Companies Act, 1956 has been adopted.
2. Stock of Medicines, Chemicals and Other Surgical Instruments amounting to Rs. 7,37,474.37 are brought to the accounts as valued by various Departments.
3. Capital Commitments pending execution as at 31st March, 1991 works out to Rs. 48,00,012/- consisting Rs. 17,75,704/- representing Building Works Extension of Phase I and Rs. 30,24,308/- for Piling Works for Building Phase II.
4. Grant-in-Aid from Central Government includes an amount of Rs. 1.20 Crores representing the Capitalised Value of Equipments received as per Indo-Japanese Grant-in-Aid Agreement through the Ministry of Health and Family Welfare, New Delhi vide letter No. DOZ-35011/1/88 MG (VII, III).
5. Out of the Grant received from Government of Kerala amounting to Rs. 206.72 Lakhs, an amount of Rs. 79.72 Lakhs have been transferred to Capital Fund representing Fixed Assets and other Equipments acquired/constructed during the year. The balance of Rs. 127.00 Lakhs has been treated as Revenue Grant and taken to Income and Expenditure Account in the absence of any stipulation as regards the nature of the Grant.
6. The amount credited to Cancer Care for Life Fund Account in earlier years upto 1989-90 could not be reconciled with the corresponding investments to the tune of Rs.15,105/-. This has been accounted for as Term Deposit Suspense and disclosed in Balance Sheet.
7. The land assigned by the State Government vide Order GO/619/88 RD dated 28-7-1988 measuring 69 Cents at

Palghat, and the building constructed there in for Rs. 1,27,119/- for which the receipt of Patta has not been received.

8. 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 the accounts since the clear document of Title has not been received.
9. Claim made by the Executive Engineer, Special Buildings, P. W. D. amounting to Rs. 3,45,615/- for deposit works carried out for R. C. C. has not been acknowledged as debt and hence treated as Contingent Liability and not provided for in the accounts.
10. Previous years figures has been grouped wherever necessary.
11. An amount of Rs. 15,363/- included in advances viz. Purchase Advance Rs. 363/- and Other Advance Rs. 15,000/- has not been provided for in the accounts, since the matter is pending negotiation.

For SANKAR & MOORTHY
Chartered Accountants

Sd/-
H. KRISHNAMOORTHY
Partner

SANKAR & MOORTHY
Chartered Accountants

Phone: 68356
Gandhari Amman Coil Street
Thiruvananthapuram-695 001

UTILISATION CERTIFICATE

Certified that the Grant of Rs. 2,06,72,000/- (Rupees Two Crores Six Lakhs Seventy Two Thousand only) received during the year 1990-91 by the Regional Cancer Centre Society, Thiruvananthapuram (Regn. No. 567/81) from the Health and Family Welfare Department, Government of Kerala, as per the Government Orders:-

	<i>Lakhs</i>
GO/Rt. 1524/90 -- H&FWD dt. 10-5-1990	42.00
GO/Rt. 2494/90 -- H&FWD dt. 7-8-1990	45.00
GO/Rt. 3302/90 -- H&FWD dt. 3-1-1991	50.00
GO/Rt. 598/91 -- H&FWD dt. 25-2-1991	58.25
GO/Rt. 1025/91 -- H&FWD dt. 27-3-1991	11.47
	<hr/> 206.72 <hr/>

has been utilised by the Society during the year 1990-91 for the purpose of Chemotherapy and Nuclear Medicine and Allied Services and also for the overall development and maintenance of the Institution and other working expenses, implementation of projects, construction of buildings, functioning of Early Cancer Detection Centre and National Tumor Registry.

For SANKAR & MOORTHY
Chartered Accountants

Sd/-
H. KRISHNAMOORTHY
Partner

28-10-1991

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SANKAR & MOORTHY
Chartered Accountants

Phone - 68356
Gandhari Amman Coil Street
Thiruvananthapuram-695 001

UTILISATION CERTIFICATE

Certified that the Grant of Rs. 7,04,766/- (Rupees Seven Lakhs Four Thousand Seven Hundred and Sixty-six), out of the Grant received amounting to Rs 20 Lakhs from the Ministry of Health and Family Welfare, Government of India vide Letter No. 22015/3/90R dated 27-3-1991, has been utilised by the Society during the year ended 31st March, 1991, for purchase of equipments in connection with the development of the Regional Cancer Centre.

For SANKAR & MOORTHY
Chartered Accountants

28-10-1991

Sd/-
H. KRISHNAMOORTHY
Partner

CANCER CARE FOR LIFE SCHEME

Modern medical management of cancer is expensive on account of the enormous cost for diagnosis and treatment. As such a number of patients especially of the weaker section do not comply with the stringent requirements of modern treatment. The R.C.C. sought to relieve the problem to a certain extent by offering to the residents of Kerala, a welfare scheme called "Cancer Care for Life". It was introduced with effect from 1-7-1986, and period of enrolment continued upto 30-6-1991. Anyone who is not a cancer patient could become a member of the scheme by filling in an application form for membership and making a one-time remittance of Rs. 101/- to a designated bank. A membership card was issued to those joining the scheme. The membership in the scheme entails the applicant to receive cancer diagnostic and treatment facilities at the R.C.C., Trivandrum in the unfortunate event of getting cancer anytime during his life-time after 2 years from the date of enrolment. R.C.C. meets Bus/Railway fare from residence in Kerala for the first trip to the Centre and accommodation charges according to the rules of the Centre. If the Academic Forum after due consideration of various facts recommend advanced treatment elsewhere such expenses are also met by in the Centre.

The details of working of the scheme are given below:

	Upto 31-3-1990	During 1990-91	Upto 31-3-1991
	Rs.	Rs.	Rs.
1. No. of persons enrolled in the scheme	1,06,000	37,800	1,42,800
2. Investment under the scheme	1,10,10,000	48,57,600	1,58,67,600
3. No. of members who have claimed benefits under the scheme	50	61	111
4. Expenditure incurred in granting benefit to members	1,28,000	3,35,400	4,63,400

LIST OF STAFF

<i>Director</i>	—	Dr. M. Krishnan Nair
<i>Superintendent</i>	—	Dr. N. Sreedevi Amma
<i>Hon. Secretary (Academic)</i>	—	Prof. A. Joseph

RADIOTHERAPY

Dr. M. Krishnan Nair	—	Director & Professor
Dr. N. Balakrishnan Nair	—	Professor
Dr. F. Joseph	—	Associate Professor
Dr. B. Rajan	—	"
Dr. T. Gangadevi	—	"
Dr. C.S. Rafeeka Beegum	—	"
Dr. P. G. Jayaprakash	—	"
Dr. V. Narayana Bhattathiri	—	Assistant Professor
Dr. Jayaprakash Madhavan	—	"
Dr. K. Ramadas	—	"
Dr. G. Suroshchandra Dutt	—	"
Dr. K. Ratheesan	—	"
Dr. K. S. Thomas	—	Lecturer
Dr. Francis V. James	—	"

DENTAL WING

Dr. K. R. Nalinakumari	—	Lecturer
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IMAGEOLOGY DIVISION

Dr. K. Sasidharan	—	Associate Professor
Dr. V. Padmanabhan	—	"
Dr. V. M. Pradeep	—	Assistant Professor
Dr. K. Ramachandran	—	"
Sri. K. Reghu Ram Nair	—	"
Smt. B. Vimala	—	Radiographer
Smt. V. Sheela	—	"
Sri Joe D'Cruz	—	"
Smt. B. R. Suja	—	"
Smt. S. I. Sathyalekha	—	"

RADIATION PHYSICS

Dr. T. P. Ramachandran	—	Associate Professor
Sri. P. G. Gopalakrishna Kurup	—	"
Sri. C. A. Davis	—	Assistant Professor
Sri. Thayal Singh Elias	—	Lecturer
Smt. Suseelamma, S.	—	Radiographer
Smt. C. Anitha	—	"
Sri N. Sadasivan Nair	—	"
Smt. T. G. Radhamony Amma	—	"
Smt. M. Leela	—	"
Sri. C. Viswanathan	—	"
Smt. P. Seetha	—	"
Sri. P. Ramabhadran	—	"
Smt. Susamma George	—	"

CYTOLOGY

Dr. N. Sreedevi Amma	—	Professor
Dr. B. Chandralekha	—	Associate Professor
Dr. Elizabeth K. Abraham	—	Assistant Professor
Dr. G. Rajasekharan Pillai	—	"
Smt. J. Ambika Kumari	—	Senior Scientific Officer
Sri. G. Raghunathan Nair	—	Cytologist
Sri. K. Raveendran Pillai	—	Cytotechnologist
Smt. C. Radhamma	—	Lab. Technician
Smt. S. Najeeya	—	"
Smt. G. Leelamma	—	Technician

SURGICAL ONCOLOGY

Dr. Thomas Cherian	—	Associate Professor
Dr. Gladys Jeevy	—	Anaesthetist
Dr. Paul Sebastian	—	Assistant Professor
Dr. Santhosh John Abraham	—	Lecturer
Dr. D. K. Vijayakumar	—	"
Sri. R. Harikumar	—	Theatre Assistant
Sri. K. Thankappan Chettiar	—	Helper

PAEDIATRIC ONCOLOGY

Dr. P. Kusuma Kumari	—	Assistant Professor
Dr. S. Rajeev Kumar	—	Lecturer

MEDICAL ONCOLOGY

Dr. V. P. Gangadharan — Assistant Professor

COMMUNITY ONCOLOGY

Dr. Babu Mathew — Associate Professor
Dr. Ramani S. Wesley — Lecturer

CANCER RESEARCH

Dr. Prabha Balaram — Associate Professor
Sri. Raveendran Ankathil — Scientific Officer
Sri. Thomas Abraham — "
Smt. Molykutty John — Lecturer
Smt. P. Ramani — "

CLINICAL LABORATORY

Smt. B. Padmavathy Amma — Technical Officer
Smt. C. Gangadevi — Lab. Technician
Smt. J. Usha — "
Smt. P. Renuka — "
Smt. A. Leela — Animal House Keeper-cum-Attender
Sri. K. Vikraman Nair — "

HOSPITAL CANCER REGISTRY AND MEDICAL RECORDS

Sri. P. Gangadharan — Assoc. Prof. of Cancer Epidemiology (Statistics)
Dr. R. Sankaranarayanan — Assoc. Prof. of Cancer Epidemiology & Clinical Research
Dr. Cherian Varghese — Asst. Prof. of Cancer Epidemiology & Clinical Research.
Sri. R. Raveendran Nair — Medical Records & Clinical Services Officer
Smt. G. Padmakumari Amma — Medical Statistician
Smt. Aleyamma Mathew — Lecturer in Computational Statistics

Smt. P. T. Latha — Social Investigator
Smt. Anita Nayar — "
Smt. V. Jalejakumari — Clerk
Sri. L. G. Amaldas — "
Sri. G. Rajasekharan Nair — "
Smt. C. Sreedevi Kutty — Typist
Smt. D. Chandrika — Coding Clerk
Sri. B. Sreekumar — "
Smt. P. G. Sarladevi — Cashier
Smt. R. Sheelakumari — "
Sri. C. Mohanachandran — Clinical Records Assistant
Sri. K. Anilkumar — "
Smt. Siju R. Nair — "
Smt. S. Sreelatha — "
Sri. K. B. Rajendra Prasad — Telephone Operator-cum-Receptionist
Sri S. Rajayyan — Helper

PHARMACY DEPT.

Smt. K. C. Maya — Pharmacist - cum - Store keeper

SECURITY SERVICES

Sri. S. Vijayan Nair — Sergeant
Sri. K. Thankappan Nair — Security Guard
Sri. N. Achuthan Nair — "
Sri. G. Sukumaran Nair — "
Sri. B. Somasekharan Nair — "
Sri. K. P. Rajeswaran — "
Sri. B. Stellace — "
Sri. B. Sahadevan — "

NURSING SERVICES

Sr. Vijaya — Nursing Superintendent
Smt. P. M. Aleykutty — Staff Nurse
Smt. S. Geetha — "
Smt. V. S. Anithamony — "
Smt. K. C. Nirmala — "
Smt. S. Prasanna Kumari — "

Smt. P. Premalatha	—	"
Smt. Sheela Rodriguez	—	"
Smt. C. P. Zaina	—	"
Smt. V. Christeen	—	"
Smt. N. Sobhana	—	"
Smt. V. Valsala Kumari	—	"
Smt. Sunithakumari	—	"
Smt. Ambily Prasad	—	"
Smt. K. Radha	—	"
Smt. S. Jayalakshmi	—	"
Smt. B. S. Geethakumary	—	"
Smt. Sally Thomas	—	"
Smt. C. Krishna Kumari	—	"
Smt. P. V. Padmaja	—	"
Smt. P. Sulekha Beevi	—	"
Smt. K. Vijayalakshmy	—	"
Smt. Suraja Kumari	—	"
Smt. M. G. Sobhana	—	"
Smt. Rajifa Beegum	—	"
Smt. P. V. Ambujam	—	"
Smt. Mary Treesa	—	"
Smt. N. Geetha	—	"
Sri. P. P. Mohamadali	—	"
Sri. Baiju Sreenivas	—	"

LIBRARY

Sri. C. Chandrakumaran Nair	—	Librarian
-----------------------------	---	-----------

DIRECTOR'S OFFICE

Sri. N. Ramaswamy Iyer	—	Secretary & CA to Director
Smt. B. Savithri Anma	—	Confidential Assistant
Sri. P. Antony	—	Helper

ADMINISTRATIVE OFFICE

Sri. P. K. Bhaskaran Nair	—	Registrar
Sri. G. Sadasivan	—	Administrative Officer
Sri. K. R. Bhaskaran Nair	—	Finance & Accounts Officer

Sri. K. J. Raju	—	Financial Assistant
Sri. K. Sasikumar	—	Cashier
Sri. G. Gnanaswaran	—	Accountant
Smt. R. Sudevi	—	Confidential Assistant
Smt. S. Mallikadevi	—	"
Smt. S. Anitha	—	"
Sri. S. V. Sasikumar	—	Office Assistant
Smt. N. Beena	—	"
Smt. B. Lalitha	—	"
Smt. K. Rajalekshmi	—	"
Sri. K. Sreedharan Nair	—	"
Smt. C. Shylaja	—	"
Sri. P. Krishnan Nair	—	Driver
Sri. P. Sreekumaran Nair	—	"
Sri. N. Sasidharan Nair	—	"
Shri T. P. Krishnadasan	—	"
Sri. M. Subair	—	Helper
Sri. K. Devaraja Panicker	—	"
Sri. G. Surendran	—	"
Sri. R. Anil Kumar	—	"
Sri. C. Hari	—	"
Sri. K. G. Balachandran	—	"
Sri. P. Gopakumar	—	"
Sri. P. S. Suresh	—	"
Sri. L. Balachandran	—	"
Sri. K. Sivankutty	—	"
Sri. S. Senan	—	"
Smt. P. Seethalekshmi	—	"
Smt. M. Amrithamma	—	"
Sri. C. S. Santhosh Kumar	—	"
Sri. John Evidus	—	"
Sri. A. Krishnan Kutty	—	"
Sri. R. Sasikumaran Nair	—	Helper-cum-Watchman

ENGINEERING WING

Sri. G. Raveendranathan Nair	—	Project Engineer
Sri. A. Rajan	—	Maintenance Engineer (Elec.)
Sri. L. Vijayakumar	—	Asst. Maintenance Engr. (Mech.)

Sri. R. Ashokan Nair	—	Ist Grade Overseer
Smt. P. Suseela	—	Confidential Assistant
Sri. A. R. Santhosh Kumar	—	Supervisor
Sri. N. Sasidharan	—	"
Sri. K. R. Rajendran	—	"
Sri. B. Rajeevan	—	"

EARLY CANCER DETECTION CENTRE, ERNAKULAM

Dr. B. Syamala Kumari	—	Cytopathologist
Smt. Mercy Joseph	—	Cytotechnologist
Sri. K. Sujathan	—	"
Sri. K. S. Jayalal	—	Cytotechnician
Sri. James Thomas	—	"
Smt. L. Madhavikutty Amma	—	Staff Nurse
Smt. T. P. Ramani	—	U. D. Typist
Smt. N. Santhakumary	—	Hospital Attender Gr. II
Sri. P. M. Abdul Rahiman	—	Helper
Sri. V. Soman	—	"

EARLY CANCER DETECTION CENTRE, PALGHAT

Dr. R. Ananda Kamath	—	Cytopathologist
Smt. C. Radha	—	Cytotechnologist
Sri. B. Anujan	—	"
Sri. A. Nataraj	—	Cytotechnician
Smt. P. C. Bhavani	—	Staff Nurse
Smt. Lekshmikutty	—	Hospital Attender Gr. II.
Sri. G. Das	—	Helper
Sri. T. C. Luise	—	"

ACKNOWLEDGEMENT

Government of India, Ministry of Health & Family Welfare.

Government of India, Department of Science and Technology.

Government of Kerala, Department of Health & Family Welfare.

Chief Secretary to Government of Kerala.

Indian Council of Medical Research, New Delhi

World Health Organization, New Delhi.

International Union Against Cancer (UICC) Geneva, Switzerland.

British Council, Madras.

American Cancer Society, New York

National Cancer Institute, Bethesda, Maryland, U.S.A.

Allegheny General Hospital, Pittsburg, U.S.A.

Christie Hospital & Holt Institute, Manchester.

Chester Beatty Research Institute, London.

University of British Columbia—Environmental Carcinogenesis Unit, Vancouver, Canada.

Bhabha Atomic Research Centre, Bombay.

Director General of Health Services, Government of India, New Delhi.

Director, Vikram Sarabhai Space Centre, Trivandrum.

Director, Sree Chitra Thirunal Institute for Medical Sciences & Technology, Trivandrum.

Kerala State Committee on Science, Technology and Environment, Trivandrum.

Director of Medical Education, Kerala.

Director of Health Services, Government of Kerala, Trivandrum

Principal, Medical College, Trivandrum.

Superintendent, Medical College Hospital, Trivandrum

Superintendent, Sree Avittam Thirunal Hospital for Women and Children, Trivandrum.

Dean, Dental College, Trivandrum.

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