



REGIONAL CANCER CENTRE

TRIVANDRUM

1985 - 1986

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INTRODUCTION

The Regional Cancer Centre, Trivandrum has completed four years of its existence and three and a half years of its planned growth as envisaged in the Development Programme. It is quite gratifying to note that during this short period this Centre has made rapid growth in many of its activities.

During the year 1985-86, the Centre had the privilege of having Sri. K. Karunakaran, Hon'ble Chief Minister of Kerala as Chairman of its Governing Body.

Realising the important role played by the Regional Cancer Centre, in the Scientific advancement of the State the Govt. of Kerala declared this Centre as a Science and Technology Institute in 1985. In order to give additional thrust to the Research activities, a Research Advisory Committee was constituted during the year under report. The Scientific Committee was also reconstituted to evaluate periodically the overall Scientific activities of this Centre. Quite a good number of externally aided research projects including a few programmes with foreign collaboration started functioning during this year. The Centre could also conduct some valuable training courses like, the Radiobiology course, Cancer Registry course on a national basis with the help of foreign Scientists of international repute as faculty members.

A Community Oncology Division was organised during this year, to plan and implement Community oriented Cancer Prevention and Control Programmes.

With the generous financial assistance, provided by the Government of India, this Centre procured some new equipments like Linear Accelerator, Treatment Planning Computer, Gamma Camera with computer, Ultrasound Scanner and also a few costly laboratory equipments for cancer research and clinicopathological services. Hence the quality of cancer diagnosis and treatment improved considerably.

The construction work of the new building of the Centre which commenced in July, 1985 made rapid progress and the

first phase is almost over. It is expected that one block will be ready for occupation by January, 1987. The approximate expenditure for this construction will be to the tune of three crore rupees. We are indebted to the Government of Kerala for providing necessary funds and to the Government of India for the grants.

Regular Faculty meetings, Journal Clubs, Clinicopathology conferences, Special Clinics, Seminars in Oncology etc. enriched the academic performance of this Centre, considerably.

The Governing Body sanctioned a membership scheme called "Cancer Care for Life" with the objective of providing most modern and high technology Cancer care to the public through the Regional Cancer Centre, on a payment of a nominal sum of Rs. 101/- only once in their life time.

The annual report for the year 1985-86 contains details of activities of all divisions, administration and the statement of accounts.

DEPARTMENTAL ACTIVITIES

DIVISION OF RADIOTHERAPY

Dr. M. Krishnan Nair	-	Director and Professor
Dr. T. K. Padmanabhan	-	Superintendent and Professor
Dr. F. Joseph	-	Associate Professor
Dr. B. Rajan	-	Associate Professor
Dr. C. S. Kuttappan	-	Assistant Professor
Dr. T. Gangadevi	-	Assistant Professor
Dr. Suresh Chandra Dutt	-	Assistant Professor
Dr. P. G. Jayaprakash	-	Assistant Professor
Dr. S. Parameswaran	-	Assistant Professor
Dr. C. S. Rafeeka Beegum	-	Assistant Professor
Dr. V. N. Bhattathiri	-	Assistant Professor
Dr. P.R. Sasindran	-	Tutor
Dr. Jayaprakash Madhavan	-	Tutor
Dr. A. Sudhakaran	-	Tutor
Dr. R. Gireesan	-	Tutor
Dr. C. S. Madhu	-	Tutor
Dr. K. Ratheesan	-	Lecturer

CLINICAL ACTIVITIES

Number of New Cases	—	4182
Number of Inpatient admissions	—	2871

Number of cases treated with teletherapy	—	4471
Number of Selectron treated cases	—	393
Number of I/C radium insertions	—	60
Number of cases treated with interstitial implants	—	115
Intracavitary treatment with Cobalt 60 Tubes	—	12
No. of Radium mould applications	—	10
No. of patients treated with chemotherapy	—	5060

This division is responsible for primary cancer care for most of the patients seen in the Regional Cancer Centre. Cancer Chemotherapy is also the responsibility of the consultants in this division in addition to Radiotherapy. The Radiotherapy and oncology outpatient clinics are conducted on all working days. This division in collaboration with other departments conduct a few special clinics.

ACADEMIC ACTIVITIES

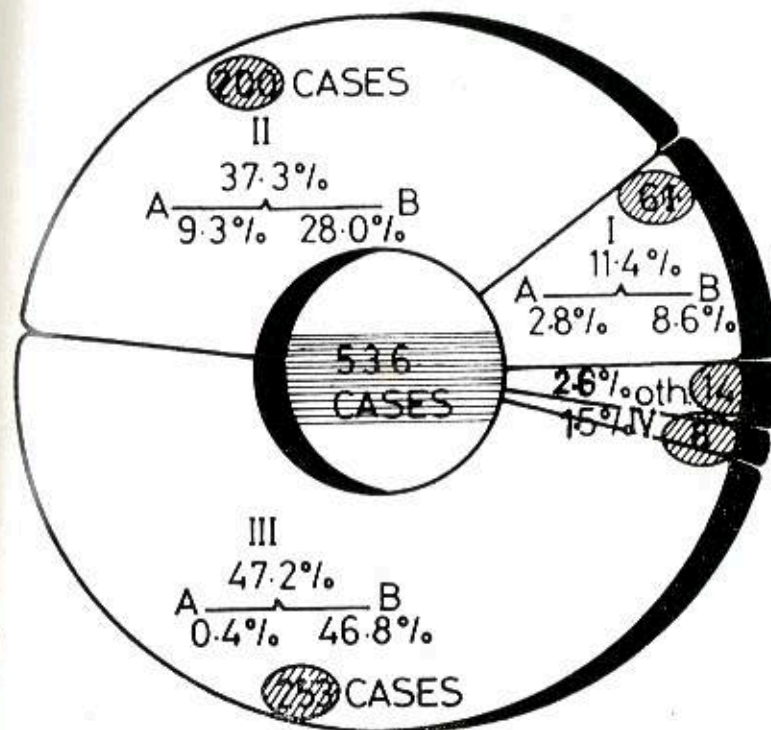
As in the previous years noon clinic is conducted on every working day to discuss problems in management of cases. Journal clubs and symposia are regularly organised to keep track of new developments in the speciality. The division also organises a clinicopathological correlation (CPC) programme once in a month in association with pathology department of Medical College and Cytopathology division of Regional Cancer Centre.

ONGOING TEACHING PROGRAMMES

- MD — Radiotherapy
- Diploma in Medical Radiation therapy (DMRT)
- MD (General Medicine, Obstetrics and Gynecology)

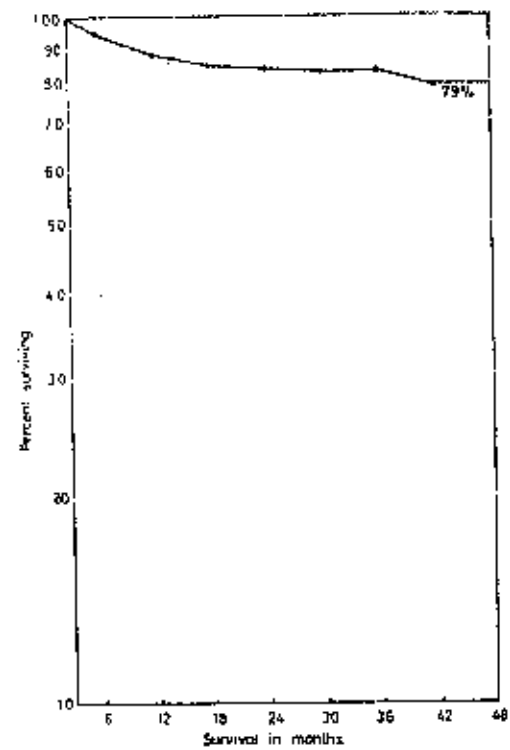
Fig. 1

STAGE DISTRIBUTION OF 536 CASES



Stage distribution of 536 cases of Carcinoma cervix treated with external radiation and intracavitary treatment (Caesium) in the years 1981 and 1982.

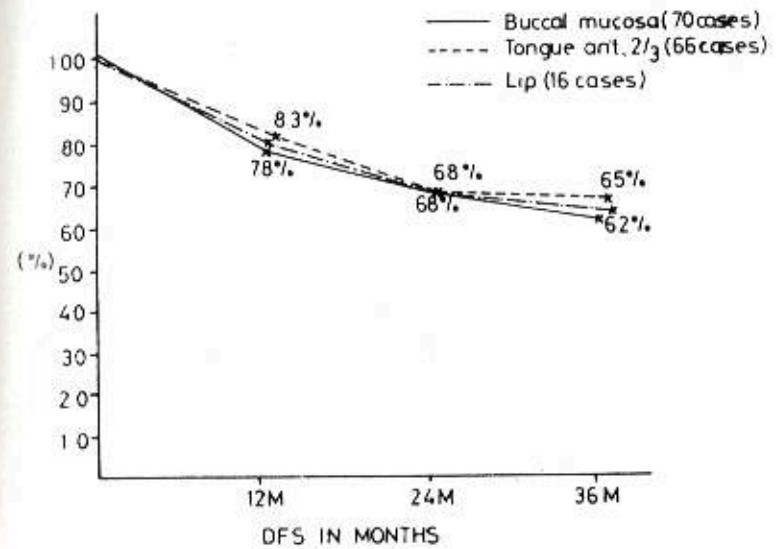
Fig. II



Survival at the end of 48 months of 636 cesium treated cases of carcinoma cervix

Fig. III

REGIONAL CANCER CENTRE, TRIVANDRUM
ORAL CANCER: RESULTS OF IMPLANTATION



Results of preloaded interstitial therapy
of 152 oral cancer patients

MS (General Surgery and ENT)

DGO, DLO

MBBS (IIIrd Year & IVth Year)

B.Sc (Nursing)

Certified Radiological assistant's course (CRA)

Hospital orientation for DRP course of BARC

A specialised course on Radiobiology was organised in co-operation with British Council with Faculty members from Radiotherapy research unit, Institute of Cancer research, The Royal Marsden Hospital, U.K.

This year MD degree in Radiotherapy of the University of Kerala was awarded to Dr. Jayaprakash Madhavan.

PAPERS PRESENTED, PUBLISHED AND CONFERENCES ATTENDED

1. Dr. M. Krishnan Nair: Cancer Larynx – Radiotherapy techniques for T1 and T2 lesions – Proc. of Indian Society of Oncol. Feb. 1986 (Bombay).
2. Dr. T. K. Padmanabhan: Radiotherapy in Carcinoma of the tongue – Indian experience Proc. of Indian Society of oncology Feb. 1986 (Bombay).
3. Dr. M. Krishnan Nair: Preloaded interstitial brachytherapy Transfer of technology programme of the ISO, 1986 (Bombay).
4. Dr. M. Krishnan Nair: Cancer problem in Kerala – Situational review – International association of Tumour registry – Hartford, Connecticut, U.S.A.
5. Dr. T. K. Padmanabhan, Dr. R. Sankaranarayanan and Dr. M. Krishnan Nair – Carcinoma of the Nasopharynx – Results of Radiotherapy – Proc. of Indian Society of Oncology, Feb. 1986 (Bombay).

Dr. M. Krishnan Nair was member of the National faculty for Technology Transfer Programme (TTP) on Head and Neck Cancer held at Bombay and Dr. T.K. Padmanabhan was in the National faculty for TTP on Breast Cancer at Delhi. These programmes were conducted in connection with ISO Conference Feb. 1986.

TREATMENT RESULTS:

So far, end result reporting from this centre was not attempted because of the inadequacy of follow up data. Now that cancer registry is in existence for the last 4 years it has become possible for this centre to report the results at least in the case of major forms of cancers. These patients were primarily treated in this centre.

A remote afterloading caesium intracavitary equipment was installed in this centre, in December 1980. In the first two years (1981 and '82) 536 cases of Carcinoma Cervix were treated with Intracavitary radiation or a combination of external radiation and Intracavitary radiation. The stage grouping of these patients and the survival at the end of 48 months are as shown in Fig. I and II.

Interstitial therapy using preloaded applicators like radium still remains a main form of treatment in this country for all accessible lesions in oral cavity in early stages-especially Buccal Mucosa, Oral Tongue and Lip. The results of 152 patients treated with implant were analysed and the 3 year results are shown. It is interesting to note that results do not vary according to individual sites (Fig. III).

DIVISION OF CANCER SURGERY

Dr. Thomas Cherian	: Asst. Prof. in Charge
Dr. Gladys Jeevy	: Anaesthetist
Dr. Paul Sebastian	: Lecturer
Dr. K.L. Jayakumar	: Research Fellow – I.C.M.R. Project

Clinical

All cases which required surgery were examined in the O.P. by a combined team of Surgeons and radiotherapists before the treatment policy was decided on the basis of the clinical stage and the site, and regional node status. Relevant investigations like x-ray, fine needle aspiration cytology, biopsies and scans when indicated, were done before treatment is started. Due to the severe constraints and lack of adequate theatre facilities, beds and post operative wards, only a limited number of cases and of limited regions are presently being operated in this department.

Surgery:

A total of 315 cases were operated on during the year under report. Tissue conservation has been achieved as far as possible. Following is the list of surgical cases:—

Carcinoma buccal mucosa	: 30
Carcinoma Tongue	: 15
Carcinoma floor of mouth	: 2
Carcinoma lower alveolus	: 10
Carcinoma upper alveolus	: 2
Carcinoma lip	: 9

Carcinoma Thyroid	:	3
Closure of orocutaneous fistulae	:	5
Regional Block Dissection	:	5
Carcinoma Breast	:	15
Total	:	96
Major	:	96
Minor	:	219

Age distribution:

Below 40	:	3
40-49	:	19
50-59	:	34
60-69	:	34
70-79	:	3
80 and above	:	4

Sex distribution:

M : F = 51 : 46

Operative mortality : Nil

It has been the policy right from the beginning to do primary reconstruction in all cases of oromandibular cancer. Surgery for the oromandibular cancer involved wide excision of the cheek, hemimandibulectomy, with supra omohyoid block and if indicated radical neck dissection.

Contrary to the general belief it was found that supra omohyoid block dissection was an adequate surgery for nodal disease in carcinoma of the buccal mucosa, in majority of cases.

It was interesting to note that even with excellent loco-regional control in Oral Cancer, a few patients were getting

distant metastasis. Three advanced cases, two cases of Cancer of lower alveolus and one case of lower lip, showed bony metastasis.

Our post operative wound infection rate (less than 10%) and other complications were low, in spite of the limited facilities. Operative mortality rate was almost absent. Only one patient died in the Post operative period during the period of review; she had advanced carcinoma breast with lung metastasis. Local disease control had been excellent; only 14 out of 96 cases developed recurrence.

Innovations:

1. **A simple technique for a one stage repair of full thickness defects of the upper lip.**

Reconstruction of the normal hairbearing upper lip in the male has always been a difficult problem in plastic surgery. The techniques have always been multistaged and the resultant hair was not of facial quality. This department has devised a simple one stage procedure for aesthetically acceptable normal hair bearing reconstruction for defects of the upper lip.

2. **Reconstruction of the Tongue.**

Following glossectomy for carcinoma of the tongue this department had been doing primary reconstruction of the tongue with excellent functional results in selected cases. The speech, swallowing, and surprisingly gustatory functions were excellent.

3. **A cheap readymade disposable vacuum suction drainage system for closed wound drainage.**

This department devised a vacuum drainage system for closed wound drainage from materials readily available in the hospital. We have been using this system in all our closed wounds, and attribute our low infection and flap failure to this. It is very cheap (costs about Rs. 10/-) compared to the commercially available vacuum suction drains which costs about Rs. 400/-.

Pain Clinic:

A pain clinic has been organised for the management of intractable cancer pain. Dr. Gladys Jeevy and Dr. Paul Sebastian are in charge of this clinic.

Academic activities:

The staff have actively participated in the undergraduate and post graduate teaching programmes in the Medical College.

Research activities:

This division co-operates with the research division of the centre, supplying them with tissue materials. Dr. Jayakumar attached to the ICMR Project is involved in the isolation of the tumour-associated antigen in carcinoma of the tongue. Kerala being an area with a large proportion of cancer of oromandibular region is ideally set to study and clarify certain ambiguities associated with treatment of cancer of the region. This division will co-operate and participate in the multi-institutional study in cancer of the buccal mucosa proposed by ICMR.

Seminar & Conferences:

Dr. Thomas Cherian attended in the International Workshop on 'Breast Cancer' in February 1986 at Delhi under Transfer of Technology Programme.

Dr. Gladys Jeevy and Dr. Paul Sebastian participated in Cancer Pain Relief Workshop in February 1986 at Ahmedabad under the same programme.

DIVISION OF PAEDIATRIC ONCOLOGY

Dr. P. Kusumakumari : Lecturer

This section was started in 1982. The number of cases reported in this division through the last few years were as follows:

1982	-	141	Cases
1983	-	153	"
1984	-	158	"
1985	-	171	"

The diagnosis related grouping of the 171 cases is as follows:

Type	Number
Leukaemia	48
Brain Tumour	42
Lymphoma	15
Soft tissue sarcoma	13
Neuroblastoma	9
Nephroblastoma	9
Retinoblastoma	10
Bone tumours	5
Miscellaneous	20
	<hr/>
	171

Sex ratio:

Male : Female .. 94:77

46% of the cases were between 1-5 year group.

Leukaemia constituted more than 1/4 of the total number of cases; More than 75% of them were getting chemotherapy from the S.A.T. Hospital, Trivandrum and they were referred to this division only at the time of cranial prophylaxis.

Out of 171 cases, 100 cases required Chemotherapy, 76 patients out of them received chemotherapy directly from the Regional Cancer Centre whereas rest of them were treated either in the S.A.T. Hospital or in other Medical College Hospitals. Drugs were supplied free of cost to more than 3/4 of these patients.

Radiotherapy was the main modality of treatment in cases of brain tumours. It was also used for cranial prophylaxis in Leukaemias, soft tissue sarcoma, advanced cases of Wilm's tumour, Retinoblastoma and Ewings sarcoma.

A number of patients required blood transfusions while getting chemotherapy. Non-availability of fresh blood was a serious constraint in the treatment of children. 300 blood transfusions were administered to 70 patients during this year. Surgical treatments of different forms were needed for more than 80 patients. These were mostly undertaken in the S.A.T. Hospital, Trivandrum.

Out patient clinic in Paediatric Oncology is being held on all days except Sundays. Detailed diagnostic work up of Paediatric Oncology patients is done as a routine. These include Haematology including bone marrow, CSF studies, Abdominal scans, C.T. examination and complete Biochemistry. All management decisions of these cases were taken by a multi-disciplinary team consisting of Paediatric Surgeon, Oncologists, Radiotherapists and Pathologists. This group meets every Monday at 12 noon. The Pathology specimens and histopathology slides are also examined at that time and reviewed. Decisions on free treatment are also taken by the academic forum during this session. All patients needing aggressive form of treatment were admitted to the wards.

Major types of Oncological problems:

Acute lymphatic leukaemia:

All patients referred initially to this centre received three drug induction regimen (Vincristine, Adriamycin and Prednisolone). With this schedule more than 75% of the patients went into remission in the first month itself.

Non-Hodgkin's Lymphoma:

Majority of the Non-Hodgkin's lymphoma received combination chemotherapy (COMP) or CHOP. Out of 6 patients who received COMP, 3 are surviving (at the end of one year) and the solitary CHOP patient is also surviving now.

Hodgkin's disease:

Four such cases were treated with classical COPP regime.

Soft Tissue sarcomas:

All 13 patients received combination of chemotherapy and radiation as per IRS II protocol. These patients were in the following stages:-

Stage II	— 4
Stage III	— 8
Stage IV	— 1

Wilm's tumour:

9 cases of Wilm's tumour were seen.

Stage I	— 3
Stage II	— 1
Stage III	— 5

All of them were treated according to NWTS-3 protocol.

Neuroblastoma:

9 cases were seen, out of which 4 who received combination chemotherapy with Vincristine, Adriamycin and Endoxan are surviving.

The Paediatric Oncology department participated in the Leukaemia clinic held in the S.A.T. Hospital, Trivandrum every

week. The following categories of students of the Medical College were trained.

- i) Undergraduate III year MBBS.
- ii) Postgraduate students (MD students in Paediatrics and General Medicine)

Conferences attended:

Dr. P. Kusumakumari attended

- i) The symposium-cum-workshop in new dimensions of foetal liver transplantation held in February 1986 at All India Institute of Medical Sciences, New Delhi.
- ii) Technology Transfer Programme on Lymphomas, Leukaemias and Paediatric malignancies held at Kidwai Memorial Institute of Oncology, Bangalore and at Cancer Institute, Adayar, Madras during February 17-22nd of 1986.

DENTAL WING

Dr. L. Sudha — Tutor
Dr. K. R. Nalinakumari — Lecturer

All the suspected Oral Cancer cases registered in the Regional Cancer Centre, were attended to in this section. During the year under report the following services were rendered.

2707 patients were referred to this section, during the year, for —

1. Extractions	: 1689
2. Biopsies	: 707
3. Bite Block	: 148
4. Miscellaneous	: 163

In addition to these, mould preparations were done in this section for all cases requiring radiotherapy of the oral cavity as well as for radium implantation.

Research:

This section is helping the Research division in the immunological studies on oral cancer.

We are actively collaborating in the Research projects of the British Columbia Cancer Research Centre, Canada, the details of which are given elsewhere.

DIVISION OF CYTOPATHOLOGY

1. Dr. M.K. Lalitha Bai	: Professor
2. Dr. B. Chandralekha	: Associate Professor
3. Dr. B. Kumari Chandrika	: Assistant Professor
4. Dr. Elizabeth Abraham	: Assistant Professor
5. Smt. J. Ambika Kumari	: Senior Scientific Officer
6. Sri. G. Reghunathan Nair	: Cytologist

MAJOR ACTIVITIES:

1. Screening of the symptomatic women attending the Gynaecological out patient, SAT Hospital for detection of the cancer of uterine cervix.
2. Assessment of Hormonal status of patients attending the obstetrics and Gynaecology Department, SAT Hospital.
3. Cytodiagnostic aspiration of cases from Medical College Hospital, SAT Hospital, SCD Hospital, Ophthalmic Hospital, W & C Hospital, Regional Cancer Centre and other Hospitals.
4. Bone marrow and peripheral smear examination of RCC patients.
5. Histopathology review of cases referred to the centre.
6. Histopathological examination of specimens received from Regional Cancer Centre.
7. Examination of materials received from Population screening from Thrikkadavoor and from various medical camps.
8. Teaching and Training.

A total of 42,827 slides were processed during the year 1985 which was 23.6% more than the previous year (1984-32, 718).

Cytology service rendered to the various sections are given below:-

Paediatrics	: 1.7%
Gynaecology	: 28.68%
Medical College Hospital	: 34.72%
Regional Cancer Centre	: 22.60%
S.C.D., Pulayanarkotta	: 12.06%
Dental and others	: 0.16%

ROUTINE WORK

Diagnostic aspirations done in the Laboratory	: 12 per day (Average)
Cervical smears collected by the Lab: staff	: 40/day
Vaginal smears collected by the Lab: staff	: 15/day
Histopathology	: 10/day
Bone marrow	: 3/day

In addition we received specimens from other hospitals.

Population screening:

During the field work at Thrikkadavoor and Trivandrum Corporation area a total number of 1782 smears were collected and screened for detection of Carcinoma of Uterine Cervix. More than a twofold increase is noted in this category as compared to the previous year. Most of them showed non-specific inflammation.

Hormonal Cytology:

2892 smears were examined. Most of the smears were collected from cases having bad obstetric history, repeated abortion, few cases like primary and secondary amenorrhea and cases of carcinoma breast.

Non-Gynaecological and Aspiration Cytology:

5783 specimens were studied for cytodiagnosis from 4579 cases. From each specimen a minimum of 4 slides were studied.

For each case of sputum 3-5 consecutive samples were examined. The specimens studied include the following:

Site	Number of cases studied
Body Fluids	860
Liver (FNAC)	327
Skin & Subcutaneous tissue	87
Thyroid	464
Lymphnode	612
Breast	513
Parotid	41
Mass abdomen	87
Bone and joints	82
Pancreas	4
Testis	10
Sputum	566
Bronchial Aspiration	95
Lung Aspiration	13
Others	818
Total	<u>4579</u>

Histopathology:

The total number of histopathology slides for second opinion received in the lab increased from 134 to 158 this year. During this year 1329 surgical specimens were processed in the laboratory.

Bone Marrow and Peripheral Smear:

305 cases of bone marrow and peripheral smear were examined. The total number of slides screened were 1220.

Teaching and Training:

Undergraduates, Pathology Post Graduates, M.L.T. students and B.Sc. Laboratory Technology students were posted in the Lab for different periods and were given training. The post graduates of other departments like Obste. & Gynaecology, Surgery, Medicine etc were given guidance in their thesis work which involved cytological aspects. A.N.Ms and Assistant Surgeons were also given training for early cancer detection. Regular oncocytology C.P.Cs. were conducted.

Training courses for Cytotechnologists and Cyto-technicians were also conducted during this year.

Research:

The Research Work on the value of fine needle aspiration biopsy diagnosis of Hepatic Malignancies is progressing.

Conferences attended:

Dr. M. K. Lalitha Bai and Dr. B. Chandralekha attended the following Conferences:

1. Annual Conference of Indian Academy of Cytology 1985 at Lucknow.
2. Annual Conference of International Academy of Pathology (Indian Division) 1985 at Udaipur.
3. Annual Conference of Indian Association of Pathologists and Microbiologists 1985 at Udaipur and
4. Dr. M. K. Lalitha Bai and Dr. Elizabeth Abraham attended IAPM Kerala Chapter (1985) held at Trichur.

Workshop:

1. Dr. M. K. Lalitha Bai was a faculty participant in the Tumour Registry Training Programme held at Trivandrum (October 7-18, 1985).
2. Dr. B. Chandralekha was a faculty participant (Subject-ongoing cytology programmes) in the workshop on prevention and Control of Cancer held at Trivandrum on 8-3-1986.

Papers presented/published:

1. Dr. M.K. Lalitha Bai was a participant in the symposium on carcinoma of the Uterine Cervix held at Udaipur (34th Annual Conference of Indian Association of Pathologists and Microbiologists)

Subject: Cytology Screening Programme for detection of carcinoma of Uterine Cervix - Experience.
2. Dr. B. Chandralekha, Dr. N. Sreedevi Amma, Dr. M. K. Lalitha Bai, Dr. B. Kumari Chandrika 1985-Value of Cytology in the Diagnosis of Hepatic Malignancies.
Abstract No. 85, IAPM, Udaipur.
3. Dr. M.K. Lalitha Bai, Dr. B. Kumari Chandrika, Dr. B. Chandralekha, Dr. T. K. Padmanabhan - 1985 - Squamous Cell Carcinoma - clear cell variant is childhood - report of two cases - abstract No. 119 IAPM, Udaipur.
4. Dr. K. T. Shenoy, Dr. Sreedevi Amma, Dr. M. K. Lalitha Bai and Dr. V. Balakrishnan - Fine needle aspiration cytology in the diagnosis of Hepatic Malignancies (sent for publication).
5. Dr. M. K. Lalitha Bai - Adenoid Cystic Carcinoma - Cytology IAPM Kerala Chapter 1985 - Trichur.

Achievements:

Indian Council of Medical Research (ICMR) accredited our Cytology Laboratory for training and examination purposes of Cytologists, Cytotechnologists and Cytotechnicians this year.

The first batch of Cytotechnologists (5 candidates) and 2nd Batch of Cytotechnicians (3 candidates) have successfully completed their training.

This division helped and co-operated in the activities of the Early Cancer Detection Centres.

Training in detection of early cancer was given for Assistant Surgeons, ANMS and other field workers of Rural Cancer Detection Centre at Thrikkadavoor, Quilon District.

Cytology Laboratory Services at a glance (1967-1985)

Year	Staff			Academic Work	Hormonal	Cervical SATH (Symptomatic)	Aspiration	Bone Marrow & peripheral smear (No. of slides)	Histopathology
	Medical	Technical	Others						
1967	1	2	2	1. Thesis Gynaecology	115				
1968	"	"	"	"	316				
1969	"	"	"	"	606				
1970	"	"	"	"	660				
1971	1	3	3	2. MBBS	743	135			
1972	"	"	"	"	727	767	201		
1973	"	"	"	"	662	1417	188		
1974	"	"	"	"	748	1549	227		
1975	"	"	"	"	1027	1923	490		
1976	"	"	"	"	1233	2670	290		
1977	"	"	"	"	1234	3151	490		
1978	2	7	2	3. M.D. Pathology	2723	3603	477		
1979	"	"	"	4. MLT 5. ANM 6. Asst. Surgeon	3639	5077	590		
1980	"	"	"	"	3427	5662	813	250	40 (Review)
1981	3	"	"	"	3739	5619	1664	430	50 (Review)
1982	"	"	"	"	3011	5618	2974	450	90 (Review)
1983	4	"	"	"	3780	5815	3810	500	134 (Review)
1984	5	"	"	"	3248	7358	4981	1095	
1985	5	6	"	7. B.Sc. MLT 8. Cyto-Technician 9. Cytotechnologist	2892	8340	5783	1220	1487 (158 Review & 1329 specimen)

(Also screened more than 27,000 asymptomatic women for early detection of Carcinoma of the Uterine Cervix in population Screening Project).

DIVISION OF NUCLEAR MEDICINE

Dr. P. Ramachandran Nair	—	Associate Professor
Dr. V. Padmanabhan	—	Assistant Professor
Dr. V.M. Pradeep	—	Lecturer
Mr. Raghu Ram K. Nair	—	Lecturer

MAJOR ACTIVITIES

During the year 1985-86, a total of 12,547 patients were registered in this division. Out of this a total of 8626 cases were referred for various Radioisotope investigations consisting of in-vivo and in-vitro diagnostics and 3921 cases for ultrasound examination.

The new Gamma Camera with Computer was inaugurated by the Chief Secretary of Kerala. Sri. V. Ramachandran I.A.S.

Radioisotope investigations:

In-vivo

Gamma Camera	—	400
Static (Thyroid)	—	3600
Uptake etc	—	426
		<hr/>
Total		4426
		<hr/>

In-vitro

T3 RIA	—	1340
T4 RIA	—	2060
TSH	—	680
BHCG	—	120
		<hr/>
Total		4200
		<hr/>

Ultrasound

OB. & GYN.	—	2640
Abdomen (Cancer)	—	142
Abdomen (Gastro)	—	786
Others	—	353
		<hr/>
Total		3921
		<hr/>

The division is concerned with the two aspects of Imaging viz.

1. Using Nuclear Medicine Techniques and
2. Using ultrasound

The general equipments available in the department are:—

- a. Gama Camera-Computer System
- b. Rectilinear Scanner
- c. Thyroid Probe.
- d. Renograph unit
- e. RIA counter
- f. Automatic RIA counter
- g. Shadow shield whole body monitor
- h. Real Time ultrasound scanner with different probes.

With the limited staff available, all the equipments were put to the maximal use for various types of investigations. A major thrust of the department is towards the establishment of a standardised RIA set up to cater to a kaleidoscopic spectrum of RIA needs. It is worth emphasising the fact that the department at present is almost catering to the need of the whole State for investigations in the field of Thyroidology.

Research activities:

Considering the importance of studies on the regional health problems, the emphasis has been given to programmes incorporating broad-based studies on the various diseases common in our settings. The following aspects have been taken as long term on-going research programmes of the division.

1. Hormonal patterns in Thyroid disorders.
2. Iodine kinetics in adolescent goitres.
3. Functional status of solitary and Multiple lesions of Thyroid (High land region of Kerala).
4. Spatial distribution and Radiotracers and their Temporal sequence in different thyroid disorders.
5. Thyroglobulin as a marker of Thyroid malignancy (ICMR Project).
6. Thyroid Function after Head & Neck Irradiation (ICMR Project).
7. Non-Invasive Screening for Osteoporosis in the Perimenopausal women.
8. Ultrasound Characterisation of solitary thyroid nodules.
9. Ultrasound screening of extra cranial carotid arterial system in the elderly.
10. "Window" ultrasonography in "High Risk" neonates (CSIR Project).
11. Ultrasonic assessment of Foeto-placental unit.
12. Ultrasound Profile of mass lesions of liver.
13. Neurone specific enolase-(NSE) as a marker for apudomas.
14. Scintigraphic Profile of metastatic carcinoma.

Future Programmes:

1. Thermographic Profile of solitary thyroid nodules vs ultrasound and scintigraphy.
2. B12 absorption studies during and after abdominal irradiation.
3. Insulin antibody studies in different types of Diabetes mellitus.
4. Prolactin levels in Hansen's Disease.
5. Screening for Neonatal chemical Hypothyroidism (NCH)
6. Goitre survey in juvenile population of Kerala.
7. Atrial Natriuretic peptide (ANP) in different types of hypertension.
8. Thermomammography vs. ultrasonomammography in breast lesions.

Teaching:

The staff of the Division are involved in teaching Nuclear medicine and allied sciences to postgraduate students, undergraduate students and for paramedical staff. The staff were also guide/co-guide for D.M. and M.D./M.S. students of other departments.

Conferences etc attended/papers presented/papers published.

1. Mr. Raghu Ram K. Nair participated in the IAEA - BARC - Workshop on quality control in RIA (Bombay, Oct. 1985).
2. Dr. V. M. Pradeep participated in the IAEA "Train the Trainee" programme in RIA, Beijing (China) Oct. 1985.
3. "Ultrasound in Tumour Diagnosis" - Guest lecture by Dr. P. Ramachandran Nair, at the All India Symposium cum workshop, Biomedical Engineering Society of India, Bombay, Nov. 1985.

4. Dr. P. Ramachandran Nair, Chaired a Scientific session and presented 4 papers in the 16th Annual Conference of Society of Nuclear Medicine, India, at Bangalore, Dec. 1985.
5. Dr. P. Ramachandran Nair, Dr. Pradeep, Dr. V. Padmanabhan and Mr. Raghu Ram K. Nair participated in the International Symposium on Non-Invasive Imaging New Delhi/Madras – Jan. 1986.

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

PATIENT SERVICE:

Treatment Planning in Teletherapy and Brachytherapy:

External Beam Therapy ... 4471

Intracavitary treatment
(Remote Afterloading
equipment – Selectron) ... 393

Rectal dose measurements
were done using DPD 5
dosimeter with its intra-
cavitary probe.

Intracavitary radium treatment ... 60

Intracavitary treatment
with cobalt-60 tubes ... 12

Interstitial Implants ... 115

Radium mould ... 10

QUALITY ASSURANCE OF RADIOTHERAPY EQUIPMENT:

Cobalt-60 Teletherapy units ... 4

Radiotherapy Simulator ... 1

Selectron Remote After-
loading system ... 1

Radium sources ... 603 mgs

All equipments were routinely checked and maintained by the Radiation Physics Department. This has reduced the down

time of these equipments considerably. Routine tests for ensuring quality performance of radiotherapy equipments and radiation protection surveys were carried out periodically.

This department participated in the postal dose inter-comparison programme of the Radiation Standardisation Laboratory of the Bhabha Atomic Research Centre, Bombay.

The personnel Monitoring service was extended to all personnel (90 persons) by this department. This department provided the physics support to the Radio-diagnosis department of the Medical College Hospital, Trivandrum. These included quality assurance of X-ray diagnostic machines, their maintenance and possible repairs as and when needed.

STUDIES UNDERTAKEN CURRENTLY:

Studies are being undertaken in the fields of:-

- (a) Dosimetry in Selectron treatments.
- (b) Dosimetry in total body and hemibody irradiation.
- (c) Measurement of dose to critical organs in radiotherapy patients.

ACADEMIC PROGRAMMES:

The following categories of students were trained in this department.

M.D. Students in Radiodiagnosis and Radiotherapy.

D.M.R. (D & T).

C.R.A. Students.

III Yr. MBBS Students.

DRP Diploma Students of the BARC and University of Bombay.

Conferences attended and Papers Presented:

1. 'Rectal Dosimetry in Selectron Treatments'. Paper presented by Dr. T. P. Ramachandran at the VIIth Congress of Assoc: Rad: Onco: of India, Bangalore during October 1985.

2. 'Faults and Breakdowns in Selectron LDR System - Three and Half Years Experience'.

Paper presented by Shri. P.G. Gopalakrishna Kurup at the VIIth Congress of Assoc: Rad: Onco: of India, Bangalore during October 1985.

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DIVISION OF RESEARCH

Dr. J. Stephen	— Associate Professor
Dr. (Mrs) B. Prabha	— Assistant Professor
Mr. T. Vijayakumar	— Senior Research Officer
Mr. K.K. Vijayan	— Lecturer
Mr. Thomas Abraham	— Scientific Officer
Mr. Ravindran Ankathil	— Scientific Officer
Mrs. B. Padmavathy Amma	— Technical Officer

As in the previous years the Research Division has been engaged mainly in clinically oriented research on human cancer in the fields of Biochemistry, Immunology, Cell Biology and Cytogenetics.

In Biochemistry the work on plant lectins is in progress. Seeds from various plant species were screened for specific lectins. Isolation, purification and characterization of these lectins were also undertaken. Purified lectins conjugated with horse radish peroxidase were incubated with cryostat sections, dewaxed paraffin sections and smears of various tissues including cancerous tissues of specific organs in search of tissue specific binding of these lectins. So far, only the jackfruit lectin has shown fairly good tissue specificity as reported last year. Another piece of work in Biochemistry has been the isolation of naturally occurring flavanoids, elucidation of their structure, synthesis of their analogues and employment of these for radiation sensitization studies.

Quantitative estimation of biochemical markers such as alpha-feto protein, Carcinoembryonic antigen, beta two microglobulin in the blood of cancer patients before and during treatment has also been undertaken using imported kits. Research in Immunology centred around tumour associated antigens, circulating immune complexes, cell mediated and humoral immune response are in progress.

More than 80% of the oral cancer patients showed in their sera antibodies to cytoplasmic component of oral cancer cells as evidenced from immunofluorescence studies. Patients with other cancers also showed high incidence of antitumour antibodies in their sera.

"Detection and isolation of circulating immune complexes" has been another research project giving encouraging results. The presence of circulating immune complexes was detected in the sera of oral cancer patients by polythyleneglycol precipitation and the values were compared with those of the controls. The circulating immune complex was characterised for the immunoglobulin type using radio immunodiffusion method. It was observed that the sera of the patient group had high levels of circulating immune complexes and these were of Ig G and Ig A types. There was no stage associated difference in circulating immune complexes.

In another study biochemical and immunological alterations in premalignant and malignant lesions of the oral cavity were investigated. Cell mediated and humoral immune responses were studied in oral leukoplakia, oral submucous fibrosis and oral cancer and these were compared with those of the normal controls. Total and high affinity rosette forming cells were assessed for cell mediated immunity and serum and tissue immunoglobulins were estimated for humoral immunity. A depression in cell mediated immunity was observed in oral submucous fibrosis and oral cancer patients compared to controls and an elevation in serum and tissue immunoglobulins Ig A, Ig D and Ig E in these patients. Also a progressive decrease in serum copper and zinc levels was observed from oral leukoplakia to oral cancer through oral submucous fibrosis. Copper/Zinc ratio was found to be increased in oral submucous fibrosis and decreased in oral cancer.

Comparative studies on oral cancer, breast cancer and cancer of the uterine cervix have revealed a depression in cell mediated immunity which progressed with the progression of the disease. Similarly immunoglobulins were also found to be altered in all types of tumours studied and the alterations were correlated with clinical stages. Circulating immune complexes and the

antibody concentrations of the immune complexes were also found to be increasing with the progression of cancer. The immunological status returned to normal level in patients who responded to treatment whereas it remained altered in patients who were still on treatment for residual lesions.

The ICMR project on the immunotherapy of the cancer of the tongue is also progressing well.

In the field of cell biology, in addition to the establishment of primary cultures and subcultures of human tumour cells, mouse fibrosarcoma cell cultures have also been established for studies of drug and radiation response of the cell types. The technique of autoradiography was successfully employed for the detection of even minute traces of radioactive materials happened to be incorporated in human body.

Chromosome studies on leukamiae and lymphomas were undertaken with the view of establishing cause effect relationship, diagnosis, prognosis and cytogenetical description. In lymphomas aneuploidy was a salient feature with occasional occurrence of polyploidy. Ph¹ chromosome was present in 95% of CML cases. Other cytological abnormalities such as coenocytosis, anisonucleosis, nucleolar variations etc were also encountered.

Research Papers published.

1. Sasidharan, V.K., Vijayakumar T., Kumari T.V. and Vasudevan, D.M. Immunological assessment of patients suffering from carcinoma. *Ind. J. Radiology and Imaging* 39:67 (1985).
2. Vijayakumar, T. and Vasudevan, D.M. High affinity rosette forming cells in carcinoma of oral cavity, breast and cervix. *Cancer Letters* 27:339 (1985).
3. Vijayakumar T. and Forrester, J.A.: Isolation and tissue staining characteristics of lectins from winged bean and jack fruit. *Proc. Intern. Symp. on Impact of Biotechnology on diagnostics* p.p. 150 (1985).

Vijayakumar, T., Ravindran Ankathil, Ramani P., Sasidharan V.K., Vijayan K.K. and Vasudevan D.M. Serum immunoglobulin in patients with carcinoma of oral cavity, uterine cervix and breast. *Cancer Immunol. Immunother.* 22:76. (1986).

Ph.D. Degree.

Mr. V.K. Sasidharan, former research fellow of this Division was awarded Ph.D. degree by the University of Kerala for his research work on immunological and biochemical aspects of oral cancer.

Conferences/Seminars attended.

Mr. Vijayakumar T., Senior Research Officer participated in the Annual Conference of the Society of Biological Chemists of India held in Pantnagar in November 1985 and presented the paper entitled "Search for tissue specific plant lectins. He also presented "Cell mediated and humoral immune response in solid tumours" at the Annual Convontion of Indian College of Allergy and applied Immunology held in Calcutta in December 1985 and "circulating immune complexes as biological markers in solid tumours", at the First National Seminar Cum Workshop on Monoclonal antibodies in clinical oncology held in Madras in December, 1985. Mr. T. Vijayakumar, presented a paper on "Lectins" at the International Symposium held at Rome in April 1985

Mr. Ravindran Ankathil, Scientific Officer participated and presented the paper "Serum and tissue immunoglobulin levels in pre-malignant and malignant lesions of the oral cavity" at the 19th Annual Convention of Indian College of Allergy and Applied Immunology held in Calcutta during 2nd to 4th December 1985. He also attended the first National Seminar Cum Workshop on monoclonal antibodies in experimental and clinical oncology held in Madras in December, 1985.

Mr. Thomas Abraham, Scientific Officer attended a short term training course in Hybridoma Technology sponsored by the National Biotechnology Board at the School of Biological Sciences, Madurai Kamaraj University during April-May 1985. He had also participated in the Indo-U. S. workshop on interferons

in Biomedical Research at the Central Drug Research Institute, Lucknow in September, 1985. Mr. Vijayakumar T., Mr. K. K. Vijayan and Mr. Ravindran Ankathil participated in the Annual National Conference of Immunology held in Trichur in December, 1985.

INVESTIGATIONS DONE IN THE CLINICAL LABORATORY DURING 85-'86.

Complete Haematology (Hb, Tc, Platelet, Bleeding time, Clotting Time, ESR, DC)	}	— 13834
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Biochemical Investigations

Blood Urea	— 3828
Blood Sugar	— 3112
Serum Creatinine	— 3788
Uric Acid	— 2828
Bilirubin	— 2715
SGOT	— 2786
SGPT	— 2786
Alk. Phosphatase	— 2812
Acid Phosphatase	— 418
Proteins	— 2108
Albumin	— 2108
Calcium	— 418
Phosphorous	— 418
C.S.F.	
Sugar	} — 248
Protein	
Bone marrow	— 6213
Special staining (Peroxidase)	— 2108
Urine Routine	— 4685

DEPARTMENT OF MEDICAL RECORDS & STATISTICS AND HOSPITAL CANCER REGISTRY - (N.C.R.P.)

Mr. P. Gangadharan	— Associate Professor
Dr. R. Sankara Narayanan	— Asst. Professor
Mr. S. Muralidharan Nair	— Medical Statistician
Mr. R. Raveendran Nair	— Medical Record Officer

The Department of Medical Records and Statistics has been involved in patient service activities, research and training. The following patient services were managed by the department:

- A. Out Patient Registrations
- B. Inpatient Admissions and Discharges
- C. Assessment of Patient's income and levying charges for treatment and investigations.
- D. Maintenance of Medical Records and patient follow-up
- C. Other services

A. OUT PATIENT REGISTRATIONS

A total of 4182 new patients were registered during 1985. This was 122 patients ie 3% more than that registered in 1984. A continuous increase in patient attendance has been noted during the past 5 years.

Total patient attendance during the year, (both old and new together) numbered 29,593 the average daily attendance being 98 patients.

The patients were referred from various institutions throughout the Kerala State and an analysis indicates that 94% of the patients were from Kerala, the rest of the patients being from the adjoining districts of the neighbouring states. Of the total registered cases, 56% was referred from the Medical College Hospitals (MCH & SAT); 18% from the Government General Hospitals,

and 26% of the total patients was referred by private practitioners and from private hospitals. A feed back of information on the patient to the referring doctor has helped to strengthen the referral system and to develop participation of the referring physician in the total management of the patient.

At the time of registration, the social investigator obtains several socio demographic information from patients which are of great value in research. The distribution of Cancer Cases seen in 1985 is appended in this report.

B. INPATIENT ADMISSION, DISCHARGE & DEATH REPORTING

The Record Section looks after the inpatient admissions and discharges and is responsible for reporting deaths to the Municipal Corporation of Trivandrum.

A total of 2871 patients were admitted to the inpatient wards of the centre during the year. The average bed occupancy rate was 98% and the average length of stay was about 17 days. This does not include the 135 cancer patients admitted in the Pay Wards. There is no fixed quota of pay ward rooms available for cancer patients and hence the number of cancer patients of Regional Cancer Centre in the pay wards would be varying from time to time.

122 deaths occurred in the hospital which were promptly reported to the Municipal Corporation.

As we follow the Unitary System of registering the patients, i.e. one patient one number; no separate case paper is prepared or a new number given for inpatients. This enables the clinician in uninterrupted management of the patient as the total record becomes available at any time.

C. ASSESSMENT OF INCOME & LEVYING OF CHARGES

Assessment and Categorisations of all patients were done on the basis of their income and charges were collected. But the system of free treatment to all those who could not afford to

pay was meticulously followed. Thus 72% of the patients were registered in the free category and no charges were levied from them. Only 8% constituted the high income group and 20% belonged to the middle income group.

D. MEDICAL RECORD MAINTENANCE

For the storage of case papers, serial number filing system is adopted to facilitate easy retrievability of the case papers. At present we have almost 30,000 patient case papers stored in the record room.

Information retrieval is a major problem due to the large size of data source and currently we are planning for automated information storage and retrieval systems.

In the out patient counter, registration of patients is done as per serial order and the register prepared serves as the number index. Apart from this, we have:

1. Name index (master index)
2. Diagnostic index

The case papers are regularly checked and deficiencies discussed in record committee meetings.

Special efforts are made for follow-up of patients. As we follow an appointment system for follow-up, we are in a position to maintain the follow-up rate at a high level. 75% of the patients keep up the appointment. For the rest, reply paid follow-up post cards are sent promptly. During the year, 3329 such cards were mailed. For study and thesis purposes selected groups of case papers were identified and given to research workers of the centre. The section also stores the X-ray pictures of patients, but separate from the main record folder. The slides are stored in the cytopathology laboratories.

OTHER PATIENT SERVICES

Patients are issued Railway Concession Certificates, Air Concession Certificates, Essentiality Certificates, Pension Certificates

and Certificates for various other purposes. Leaflets and pamphlets highlighting the hospital procedures, maintenance of discipline etc are also provided to the patients while they present for registration or admission.

HOSPITAL CANCER REGISTRY

The Hospital Cancer Registry, Trivandrum, is one of the 6 registries of the National Cancer Registry Project of the Indian Council of Medical Research. The 1984 data covering all the cancer patients seen at M.C.H., S.A.T., Dental College and Regional Cancer Centre are being scrutinised and tabulated according to the ICMR format.

The registry staff makes regular visits to the out patient clinics, inpatient wards, medical record and pathology department for identifying cancer cases. The number of provisional registrations made during the year 1984 from the different sources were as follows:-

M.C.H.: OP & IP	—	800
Dental College	—	53
S.A.T. Hospital	—	261
R.C.C.	—	4060
Medical Records, M.C.H.	—	1656
Pathology Records	—	2112
		<hr/>
Total		8942

All the cases are being scrutinised for duplications and pre 1982 diagnosis. After eliminating such cases, we are hopeful of registering around 4150 cancer cases during the year 1984. 4000 case abstracts have already been despatched to the ICMR. An accession register is maintained for the registered cases to enable follow-up annually.

RESEARCH

Data obtained from patients are constantly subjected to epidemiologic studies. End result studies for some cancer sites have been carried out.

Studies to estimate the incidence of cancer in Trivandrum city are underway. The preliminary observations indicate that the over all incidence rate of cancer in this city's population is comparable to that seen in Madras and Bangalore. The oral cancer incidence rates are however observed to be very high; higher than in Madras, Bangalore and Bombay.

TRAINING

The Second Tumour Registrars Training Programme was conducted in October 1985.

The Indian Society of Oncology organised six Transfer of Technology Programmes of 5 days duration in connection with the 2nd biennial meeting of the society. The Regional Cancer Centre, Trivandrum was requested by the Society to host and organise the Transfer of Technology Programme in Cancer Epidemiology and Prevention from Feb. 17 to 21, 1986.

Our staff also participated as faculty for training the Multipurpose Health Workers of the Primary Health Centre, Anchalumood, Community Development Block at Thrikkadavoor, Quilon.

Some Significant Aspects of newly registered patients in R.C.C. - 1985.

Total persons registered (M: F-1.1:1)	—	4182
Number of Males	—	2163 - 52% of total attendance
Number of Females	—	2019 - 48% - do -
Number of Cancer cases	—	3686 - 88% - do -
Number of Benign tumours	—	49 - 1% - do -
Number of other conditions including no cancer	—	447 - 11% - do -

Papers presented.

✓ P. Gangadharan presented a paper on "Cancer in Kerala" in the Epidemiology Symposium during II Biennial Conference of Indian Soci: of Oncology Feb.'86, Bombay.

REGIONAL CANCER CENTRE, SITE DISTRIBUTION OF CANCER CASES - 1985

ICD 9	Mal. Neoplasm of	Male		Female		Total	
		No.	%	No.	%	No.	%
140	Lip	5	0.3	24	1.4	29	0.8
141	Tongue	149	7.7	68	3.9	217	5.9
142	Major salivary glands	6	0.3	8	0.5	14	0.4
143	Gum	54	2.8	30	1.7	84	2.3
144	Floor of mouth	23	1.2	—	—	23	0.6
145	Other and unspc. parts of mouth	248	12.8	128	7.3	376	10.2
146	Oropharynx	62	3.2	12	0.7	74	2.0
147	Nasopharynx	20	1.0	8	0.5	28	0.8
148	Hypopharynx	66	3.4	10	0.6	76	2.1
149	Other and ill-defined sites	5	0.3	—	—	5	0.1
150	Esophagus	104	5.4	38	2.2	142	3.9
151	Stomach	91	4.7	26	1.5	117	3.2
152	Small intestine, including duodenum	1	0.1	1	0.1	2	0.1
153	Colon	23	1.2	6	0.3	29	0.8
154	Rectum, rectosigmoid junction and anus	30	1.6	21	1.2	51	1.4
155	Liver and intrahepatic bile ducts	54	2.8	11	0.6	65	1.9
156	Gall blad. & ext. hepatic bile duct	3	0.2	3	0.2	6	0.2

ICD 9	Mal. Neoplasm of	Male		Female		Total	
		No.	%	No.	%	No.	%
157	Pancreas	20	1.0	8	0.5	28	0.8
158	Retroperitoneum and peritoneum	6	0.3	5	0.3	11	0.3
159	Other and ill-def. sites within the dig. organs and peritoneum	—	—	—	—	—	—
160	Nasal cavities, middle ear accessory sinuses	24	1.2	17	1.0	41	1.1
161	Larynx	90	4.6	7	0.4	97	2.6
162	Trachea, bronchus and lung	216	11.2	25	1.4	241	6.5
163	Pleura	—	—	—	—	—	—
164	Thymus, heart and mediast.	4	0.2	1	0.1	5	0.1
165	Other and ill-defined sites within the resp. system and intrathoracic organs	—	—	—	—	—	—
170	Bone	21	1.1	20	1.2	41	1.1
171	Connective and other soft tissue	23	1.2	20	1.2	43	1.2
172	Skin Melanoma	11	0.6	9	0.5	20	0.5
173	Other skin	23	1.2	13	0.7	36	1.0
174	Female Breast	—	—	347	19.9	347	9.4
175	Male Breast	5	0.2	—	—	5	0.1

ICD 9	Mal. Neoplasm of	Male		Female		Total	
		No.	%	No.	%	No.	%
179	Uterus Unsp.	—	—	6	0.3	6	0.2
180	Cervix	—	—	452	25.9	452	12.3
181	Placenta	—	—	3	0.2	3	0.1
182	Body Uterus	—	—	23	1.3	23	0.6
183	Ovary etc	—	—	99	5.7	99	2.7
184	Other Female Gen.	—	—	18	1.0	18	0.5
185	Prostate	25	1.3	—	—	25	0.7
186	Testis	22	1.1	—	—	22	0.6
187	Penis etc	26	1.3	—	—	26	0.7
188	Urinary bladder	30	1.6	2	0.1	32	0.9
189	Kidney	25	1.3	14	0.8	39	1.1
190	Eye	9	0.5	9	0.5	18	0.5
191	Brain	86	4.4	43	2.5	129	3.5
192	Nervous system	4	0.2	4	0.2	8	0.2
193	Thyroid Glands	35	1.8	74	4.2	109	3.0
194	Endo. Glands	6	0.3	3	0.2	9	0.2
195	Ill. Def. Sites	1	0.1	—	—	1	—

ICD 9	Mal. Neoplasm of	Male		Female		Total	
		No.	%	No.	%	No.	%
196	Sec. Lymph Nodes	44	2.3	19	1.1	63	1.7
197	Sec. Resp. Sites	13	0.7	10	0.6	23	0.6
198	Sec. Other sites	23	1.2	10	0.6	33	0.9
199	Primary Unknown	28	1.4	20	1.2	48	1.3
200	Lympho Sarcoma	31	1.6	14	0.8	45	1.2
201	Hodgkin's Disease	32	1.7	7	0.4	39	1.1
202	Lymphoid Tissue	44	2.3	13	0.7	57	1.6
203	Multiple Myeloma	14	0.7	7	0.4	21	0.6
204	Leuk. Lymphatic	24	1.2	16	0.9	40	1.1
205	Leuk. Myeloid	26	1.3	13	0.7	39	1.1
206	Leuk. Monocytic	—	—	—	—	—	—
207	Leuk. Specified	—	—	—	—	—	—
208	Leuk. Unspecified	3	0.2	—	—	3	0.1
230-234	Ca.-in-situ	1	0.1	2	0.1	3	0.1
TOTAL		1939	100.0	1747	100.0	3686	100.0

DIVISION OF COMMUNITY ONCOLOGY

Dr. Babu Mathew : Associate Professor

Dr. Babu Mathew took charge as Associate Professor and Head of the Community Oncology Department on 3-5-1985.

Having realised from the epidemiological studies of cancer in Kerala, that majority of cancers are preventable and curable if detected early, the centre started the Community Oncology Division in 1985-86, with main thrust on Prevention and Control of Cancer.

Objectives:

1. Preparing health education material for general public and technical personnel.
2. Organisation of Professional Training to generate necessary manpower for early detection of cancer.
3. Reorientation training programmes for Medical Officers.
4. Organisation of peripheral cancer centres and conduct of cancer detection camps.
5. Improvement of diagnostic and follow up facilities for early and pre-cancer.
6. Starting research projects on Preventable cancers in the community level as well as in the centre.
7. Organisation of photographic documents and audiovisual set up in the Regional Cancer Centre.

MAIN ACTIVITIES

A. Health Education:

During the year the Department attempted through various media in creating cancer awareness among public.

The following articles were published in the leading dailies and magazines of Kerala.

Sl. No.	Name of the article	Name of the paper/magazine	Date
1.	Cancer of the uterine Cervix	Kerala Kaumudi	4-6-1985
2.	Self Examination to Prevent Oral Cancer	Mathrubhoomi	14-7-1985
3.	Common Cancers in Kerala	Kerala Times	3-11-1985
4.	Oral Cancer	Deepika	19-1-1986
5.	An interview with oral Cancer Research Team	Arogiya Shastram	Feb. 1986
6.	Self Examination of breast	Mathrubhoomi	} Accepted for Publication
7.	Role of Social organisations in the prevention and control of cancer in Kerala	M.S.S. News Bulletin	

Through All India Radio, Trivandrum we could effectively broadcast on Prevention of Cancer. Warning signs of cancer and anti tobacco slogans were broadcast as fillers in between the main programmes.

As a joint venture of Regional Cancer Centre staff and Dhoordharsan Team two interesting and instructive programmes on Regional Cancer Centre were telecast, each of 15 mts duration.

B. Preparation of material for Health Personnel

A book in Malayalam entitled "Guidelines for multipurpose health workers for Cancer Detection" was prepared. This was used for training the ANMS and other paramedical health workers and proved to be very useful.

The format of a monograph on Oral Cancer for doctors was also prepared.

C. Other Health Education Materials

This Division prepared three brochures in Malayalam on (1) self examination of Oral Cavity to prevent oral cancer (2) self examination of breast and (3) you can only help us to help you to fight cancer.

Leaflets on warning signs of cancer were printed and distributed among the public during cancer detection camps on several occasions.

D. Training Programmes:

1. Training for paramedical health workers.

An intensive training from 9-9-85 to 14-9-85 was given to all the 43 health workers of the Primary Health Centre, Thrikkadavoor on Cancer related public Education and Early Detection of Oral, Breast and Uterine Cervical Cancers. By virtue of this training they become competent in taking up cancer detection work along with the routine duties. From October 1985 till March 1986 they were able to detect 3 new cases of Oral Cancer and over a 100 precancerous lesions of the Oral Cavity.

2. Reorientation training for Medical Officers.

Since effective work on Prevention and Control of Cancer could be implemented only with the co-operation and participation of the Medical Officers in the Health Services, a reorientation programme sponsored by I.C.M.R. was held on 8-3-1986.

3. Technology transfer programme on Epidemiology and Control of Cancer.

This division actively participated in the above cited training programme, held from 17-2-1985 to 22-2-86. Dr. Babu Mathew was one of the members of the Faculty.

E. Cancer Detection Camps:

3 Cancer Detection Camps were held during the period under report. The details are shown below:-

Sl. No.	Place	Date	No. of persons screened	New cases detected
1.	Kottayam	Nov. 1985	321	6
2.	Quilon	Jan. 1986	197	4
3.	Attingal	Feb. 1986	276	3

F. Research Activities:

- i. Collaborative studies with University of British Columbia, Canada.
- ii. Collaborative studies with British Commonwealth foundation: This division has taken up a collaborative study on Sub mucous fibrosis, with the Commonwealth foundation. The details are given separately.

G. Involvement of National Service Scheme Functionaries in Cancer related public education:

A programme to involve all the N.S.S. Volunteers (37000 approximately) of the state was finalised with N.S.S. authorities. This programme is to be launched in 1986-87 academic year.

Conferences attended and papers presented:

Dr. Babu Mathew attended the following conferences:

- ✓ 1. 40th Annual Conference of the Indian Dental Association, held at Lucknow 29 Dec. 1985. 2 papers were presented and was a panelist for a discussion on prevention of oral cancer.

Papers presented:

1. Dr. Babu Mathew and Dr. M. Krishnan Nair
A National Policy for Prevention and Control of Oral Cancer.
 2. Dr. Thresiamma Joseph and Dr. Babu Mathew.
Metastatic Retinoblastoma of the mandible.
- II. Workshop of the N.S.S. functionaries of Southern States, held at Kidwai Memorial Institute of Oncology, Bangalore Jan. 19th to 21st 1986.
1. Pattern of Oral Cancer in Kerala.
 2. Role of N.S.S. Workers in the Prevention and Control of Cancer.
- III. Transfer of Technology Programme on Epidemiology and Prevention of Cancer sponsored by Indian Society of Oncology held at Regional Cancer Centre, Trivandrum Feb. 17th to 22nd 1986.

Dr. Babu Mathew served as a member of the Faculty and presented a paper on Community level activities of Prevention and Control of Cancer in Kerala.

EARLY CANCER DETECTION PROGRAMMES

a. Primary Health Centre, Thrikkadavoor, Quilon

Medical Officer : Dr. T. Indira Devi

Though the aid for pap testing was over by 1983, the programme continued in the primary Health Centre, Thrikkadavoor in the year under report also, due to the enthusiasm of Dr. T. Indira Devi, Asst. Surgeon in Charge of the Programme and a team of devoted ANMS. From October 1985 the health workers of this area had started cancer related public education and detection of early lesions as part of their routine duties.



Shri. C. M. Sunderam Honbl. Minister for Local Administration, Kerala, inaugurating the Early Cancer Detection Centre at Palghat on 2-10-1985

Nearly 1500 smears were taken during the current year. Several Cancer Detection Camps were organised in and around the area of the Primary Health Centre. A public seminar at the end of the one week training programme for ANMS and other health workers was held at Government High School, Thrikkada-voor on 16-9-1985. Dr. Leelama Cheriyan D.M.O. and other Staff of the health services co-operated in all the activities.

b. Early Cancer Detection Centre, Palghat:

The Centre was formally Inaugurated by Shri. C.M. Sundaram, Hon'ble Minister for Local Administration on 2nd October 1985. Shri. A.K.K. Nair, General Manager, M/s. Instrumentation Ltd., Palghat has informed that the Company is sanctioning a sum of Rs. 3 lakhs to construct a building in the site earmarked by the company for the purpose. A plan for the proposed building was submitted to M/s. Instrumentation Ltd., for approval. Dr. Ramesh Hebbar, Chief Medical Officer, M/s. Instrumentation Ltd. has helped in every possible way in the initial organisation of the centre. The Government have sanctioned the deputation of a Medical Officer, one Nurse, 2 Lab Assistants and One Attender on 22-3-86. Two Cytotechnologists will be appointed by the Regional Cancer Centre soon. The centre is expected to start functioning from April, 1986. We are obliged to Dr. Ramaswamy, DMO, Palghat for all the help rendered.

c. Rotary Early Cancer Detection Centre, Ernakulam.

Dr. B. Syamalakumari : Cytopathologist

During the year under report this centre was actively involved in the conduct of camps and detection of cases. The data are furnished below:-

Camps:-	1st March, 1985 to March, 1986.	:	14 Camps
Total persons examined (Including in the camps)		:	2297 patients

Break up of Lesion

A. Gynaecological

Normal	:	507
Inflammation	:	1075
Inflammation with mild dysplasia	:	123
Inflammation with moderate dysplasia	:	31
Inflammation with severe dysplasia	:	6
T.V. Infection	:	57
T.V. with mild dysplasia	:	25
T.V. with moderate dysplasia	:	6
T.V. with severe dysplasia	:	1
Monaliasis	:	7
Monaliasis with mild dysplasia	:	1
T.V. with Reserve Cell Hyperplasia	:	1
Reserve cell Hyperplasia	:	29
Reserve cell Hyperplasia with Mild dysplasia	:	5
Reserve Cell Hyperplasia with moderate dysplasia	:	1
Reserve Cell Hyperplasia with severe dysplasia	:	1
Radiation changes	:	9

Recurrence	:	1
CIS	:	7
Carcinoma Invasive	:	5
Moderated differentiated squamous cell carcinoma	:	10
T.B.	:	1
Herpes simplex	:	3
Herpes simplex with mild dysplasia	:	1
Herpes simplex with moderate dysplasia	:	1

Buccal

Normal	:	12
Inflammation	:	31
Malignancy	:	13
Leukoplakia	:	75
Leukoplakia with atypical changes	:	25
Leukoplakia severe atypical changes	:	1
Monaliasis	:	1
Recurrence	:	1

Aspiration

Breast- Normal	:	6
Malignancy	:	3
Miscellaneous	:	61

Sputum Total Nos.	:	132
Normal	:	127
Malignancy	:	4
Atypical changes	:	1
Fluid	:	6

The Centre has made rapid progress in the activities and the Rotary Club of Kalamassery promised to provide a colposcope.

Thanks are due to Shri. M.P. Joseph, District Collector, Dr. T. Radhakrishnan and Dr. Vijayalakshmy Menon, District Medical Officers, Shri. V.N. Venugopalan, Rotary Club President, Dr. T. Ramachandran Nair, Health Officer Cochin Corporation, for their whole-hearted co-operation in all the activities of the centre.



Dr. Gordon Steel, Dr. Judith M. Deacon and Dr. John Yarnold of the Royal Marsden Hospital and Inst. of Cancer Research, Sutton, conducting the Radiobiology course in January 1986



Participants of the II Tumour Registrar's Training Programme

TEACHING AND TRAINING PROGRAMMES

M.D.Radiotherapy	: 2 students per year.
D.M.R.T.	: -do-
CRA (Certified Radiological Assistants)	: 30 Students per year
M.S. (General Surgery)	: 30 students - part-time.
M.D. (Gynaecology)	: -do-
M.B.B.S.	: 180 students-part-time
Cytotechnologists' Course	: 5 students per batch
Cytotechnicians' Course	: 6 students per batch

Besides these routine, regular courses the Centre during the year under report imparted the following special trainings and courses also.

SPECIAL TRAINING PROGRAMMES ('85-'86)

I. Radiobiology Course

The Regional Cancer Centre, had an unique privilege of having conducted for the first time in this country a Radiobiology course in January 1986, in collaboration with the British Council.

In addition to 8 faculty members of the R.C.C. and 3 of the University of Kerala we had trainees from Imphal, Delhi, Bangalore and Vellore. Dr. J.R. Yarnold, Dr. G.G. Steel, Dr. J. Deacon of the Radiotherapy Research Unit, Institute of Cancer Research, Royal Marsden Hospital, Sutton, Surrey, U.K. were the faculty members.

The Contents of the Course were:-

Introduction to Human Tumour Radiobiology	— J.R. Yarnold
The Growth Kinetics of Tumour	— G.G. Steel

Cell population Kinetics and tumour growth	— G.G. Steel
The Concept of Cell Survival	— G.G. Steel
Colonogenic cell survival	— G.G. Steel
Does the curability of Human Tumours relate to cellular Radiosensitivity	— J. Deacon
Tumour repopulation	— Yarnold
Clinical basis of fractionation	— Yarnold
Radiobiology of Normal tissue Injury	— G.G. Steel
The 4. R'S of Radiobiology	— G.G. Steel
Does the curability of human tumours relate to Hypoxia	— J. Deacon
Dose effects and hyperfractionation	— J. Deacon
New approach to fractionation	— G.G. Steel
Clinical experience with accelerated fractionation	— Yarnold
The Combination of Chemotherapy and Radiotherapy	— G.G. Steel
Clinical experiences with Drug Radiation Combination	— Yarnold

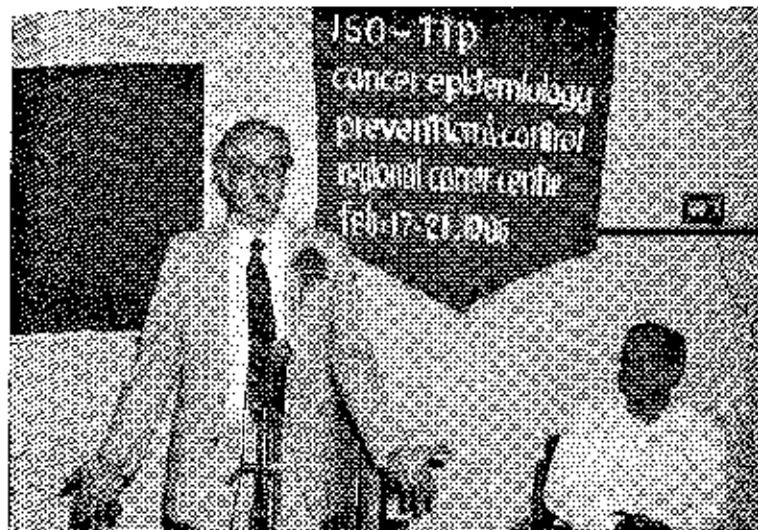
II. Tumour Registry Training Programme

The Second Tumour Registry Training Programme was conducted from October 7-18, 1985 at the Regional Cancer Centre, Trivandrum.

The course was inaugurated by Sri. V. Krishna Murthy, I.A.S., Secretary, Health, Kerala. Dr. M. Krishnan Nair, Director, Regional Cancer Centre, welcomed the gathering. During the inauguration, Sri. Krishna Murthy emphasised the need for



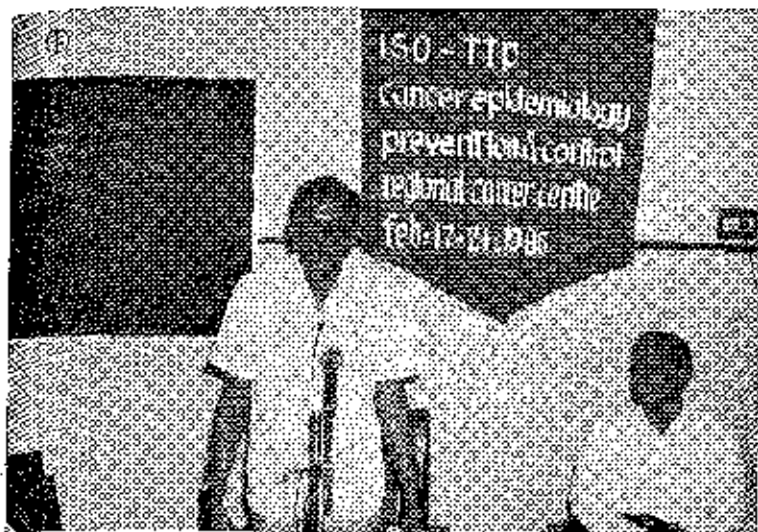
Prof. Calvin Zippin, Balraman Nair Mr. V. Krishnamurthy and Dr. M. S. Valiathan at the Inaugural function of the II Tumour Registry training programme on 7-10-1985.



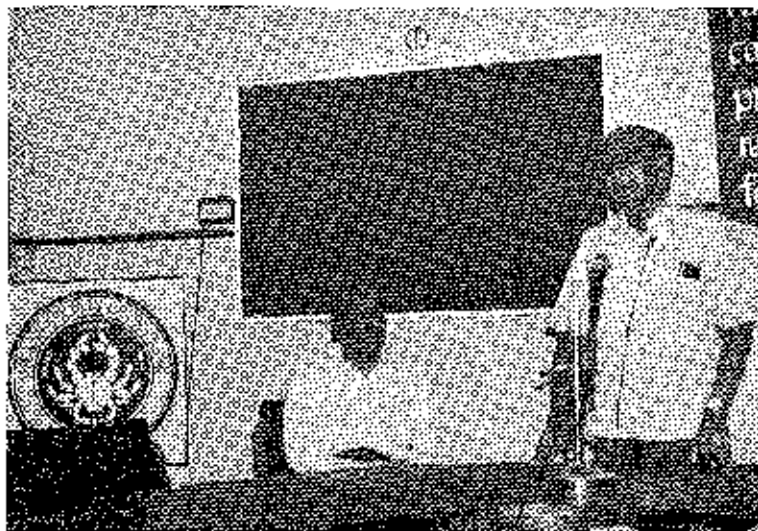
Dr. A. B. Miller of National Cancer Institute Canada
Lecturing in the Transfer of Technology Programme
on Cancer Epidemiology and Prevention.



Dr. T. Hirayama at the Transfer of Technology Programme



Shri. V. Ramachandran, Chief Secretary to Government of Kerala inaugurating the Transfer of Technology Programme on Cancer Epidemiology at a function presided over by Dr. M. Balaraman Nair,



Dr. Sarghvi at the Transfer of Technology Programme

trained personnel in the field of health, especially in cancer, which is being increasingly recognised as a major life style disease.

Dr. M.S. Valiathan, Director, Sree Chitra Thirunal Institute and Dr. M. Balaraman Nair, Principal, Medical College, Trivandrum also spoke about the need for such training. Dr. T.K. Padmanabhan, Superintendent, Regional Cancer Centre, proposed the vote of thanks.

The faculty adviser was Dr. Calvin Zippin, ScD,FACE, Director, Tumour Registry, San Francisco. The faculty consisted of staff from:

- A. Cancer Registry, San Francisco, U.S.A.
- B. Medical College & Regional Cancer Centre, Trivandrum.
- C. National Cancer Registry Project and Hospital Cancer Registry, Trivandrum.

The Co-ordinator for the course was Mr. P. Gangadharan.

Pre and Post Course evaluations were undertaken. The syllabus of the course was designed to meet the special needs of Indian Registries and the National Cancer Registry Project of ICMR.

The course content was organised in the same pattern of the programme conducted in 1984; with 50 lecture hours and 18 hours of practical session. The workshops were organised to reemphasise the theoretical lecture topics.

There were altogether 17 participants. 13 out of the 17 candidates were from the ICMR supported National Cancer Registry Project. Overall, the candidates applied well to the teaching sessions. The need for more time for anatomy lecture was felt by some candidates. The anatomy museum and pathology museum of the Medical College provided very useful teaching aids.

There was a special lecture on computer application by Dr. David Goemberg from San Francisco.

The programme was supported by a generous grant of Rs. 15,000/- by the ICMR.

A set of teaching materials and self instructional manuals were obtained gratis from the National Cancer Institute, U.S. through the kind courtesy of Dr. John Young.

Some of the teaching materials were also developed by the Regional Cancer Centre especially those relating to workshop exercise abstracting and coding.

The effort is now to gradually develop the teaching material by selecting case histories of patients suitable for abstracting and coding exercises.

It is proposed that the next course will be organised in January, 1987.

III. Transfer of Technology Programme on Cancer Epidemiology and Prevention.

The Transfer of Technology Programme on Cancer Epidemiology and Prevention was held in the Regional Cancer Centre, Trivandrum from Feb. 17 - 21, 1986 in continuation to the 2nd Biennial Conference of the Indian Society of Oncology held at Bombay from February 9 - 13. The Regional Cancer Centre was one of the six centres specially selected to conduct such Technology Transfer Programmes, other centres being Madras, Bangalore, Bombay, Ahmedabad and New Delhi.

The programme was inaugurated by Sri. V. Ramachandran, Chief Secretary, Kerala. Dr. M. Balaraman Nair, Principal, Medical College, Trivandrum took an active part in the organisation of the TTP.

There were 22 candidates from all over the country attending the programme. The faculty included eminent epidemiologists Dr. T. Hirayama, Japan, Dr. A.B. Miller, Canada and Dr. L.D. Sanghvi, India apart from staff from Medical College, and Regional Cancer Centre, Trivandrum.

Several lectures on Cancer Data Collection, Cancer Statistics, Epidemiologic methods in cancer were delivered. There were four major workshop sessions. A day was spent on Cancer Prevention.



(L to R)

Dr. C. V. Korah, Director of Medical Education
Dr. J. K. Dhas, Director of Health Services
Mr. P. K. Velayudhan, Hon. Minister for
Community Development, and Dr. M. Balaraman Nair,
participating in the Seminar on Prevention and Control
of Cancer on 8-3-'86 (sponsored by I. C. M. R.)

There was consensus of opinion that epidemiologic methods should be propagated and applied more in cancer work to study the cancer problem in India. It was highlighted that preventable cancers are a majority in the country. What was required was action to curtail smoking and chewing, propagation of pap smear techniques and self examination methods.

IV. Reorientation training for Medical Officers:
(Sponsored by Indian Council of Medical Research.)

The programme was formally inaugurated by Shri. P. K. Velayudhan, Hon'ble Minister for Community Development, Kerala. There were 46 participants. The Director of Health Services, Director of Medical Education, Principal Medical College, Trivandrum, 15 Professors (Community Medicine & Ob.& Gynae) from various Medical Colleges of Kerala, 6 District Medical Officers, 3 Programme Co-ordinators of National Service Scheme in addition to the resource persons from Regional Cancer Centre took part in the training programme.

Several decisions were taken and recommendations were made for the speedy implementation of measures for the Control & Prevention of Cancer in Kerala. The Community Development department and the Health Services Department agreed to actively participate especially in health education and early detection camps. Lectures were given on, Control & Prevention of cancer, Oral cancer, Cancer cervix, Breast cancer, Tobacco and cancer, Preventable cancer etc by the faculty members. Several papers on these topics were also presented.

ONCOLOGY SEMINARS

<i>Date</i>	<i>Name</i>	<i>Topics</i>
4-6-1985	Dr. K.P. Haridas Dept. of Surgery Medical College, Trivandrum.	Asst: Professor Surgical Management of Hepatoma.
6-6-1985	Dr. M.V. Pillai Medical Oncologist U.S. Air Force, U.S.A.	Cancer Breast
25-7-1985	Dr. R. Sripathmanathan Senior Consultaut and Faciomaxillary Surgeon, Monklands Dist. Hospital, Aridrie Scotland.	Clinical Aspects of Oral Cancer
14-8-1985	Dr. Samuel G. Taylor W.H.O. Expert and Prof. of Medical Oncology, St. Luke's Medical Centre, Chicago.	Methodology and Protocol formulation for clinical trials.
26-11-1985	Dr. Miriam P. Rosin Environmental Carcinogenesis Unit - Vancouver, British Columbia Cancer Research Centre, Canada.	Markers for early identification of individuals at risk for oral cancer.
27-12-1985	Dr. N.W. Johnson, Royal College of Surgeons, London.	Diagnostic and Prognostic Markers in Oral Cancer and Pre, Cancer.

SPECIAL CLINICS

(Multi disciplinary)

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

- I. Paediatric Oncology - on all Mondays at 12 Noon. Resource Person from other departments are Dr. V.G. Chellam, Prof. of Paediatric Pathology, Dr. Mani Ninan, Director & Prof. of Paediatric Surgery, Dr. N. Surendran, Prof. of Paediatric Surgery and Dr. Alphonsa J. Erinjeri, Holy Cross Hospital, Kottiam.
- II. Head and Neck Clinic - all Tuesdays 12 Noon. Resource person - Dr. M. Krishnamoorthy, Prof. of E.N.T.
- III. Trophoblastic Tumour clinic - all Wednesdays 12 Noon. Resource person - Dr. Sathyavathy, Director & Prof. Ob. & Gynaecology.
- IV. Clinico Pathological Conference - on 1st Saturday of every month at 11.30 A.M. Resource Persons - Dr. M.A. Aleykutty, Prof. of Pathology & Other Staff of Department of Pathology.
- V. Pain Clinic - on Thursdays at 1 P.M. Conveners - Dr. Gladys Jeevy, & Dr. Paul Sebastian.

REGIONAL CANCER CENTRE'S COLLABORATIVE RESEARCH PROGRAMMES WITH FOREIGN SCIENTISTS/AGENCIES.

1) Natural Killer Cell Activity of Lymphocytes in a Population Living in an Area of High Background Radiation in Coastal Kerala, India.

This is a Collaborative research programme supported by Rackham Faculty International and the Department of Paediatrics University of Michigan. Dr. M. Krishnan Nair and Dr. B. Prabha of the Regional Cancer Centre, Trivandrum and Dr. P.N.M. Nair and Dr. S.A. Schwartz of the University of Michigan are the participants actively involved in this study.

A preliminary in-vitro evaluation of the natural killer (NK) cell activity of lymphocytes from healthy donors was carried out in a population living in the Chavara-Neendakara region of coastal Kerala, India, an area of high background radiation (10-25 times of normal levels) due to natural deposits of thorium. This study investigates whether prolonged exposure of healthy individuals to low level radiation affects natural defense mechanisms against cancer. A single cell assay in agarose was employed to measure the target binding and killing capacity of total peripheral blood lymphocytes depleted of monocytes against K562 tumour target cell line. The percent binder and killer cells were defined as the number of lymphocytes bound to a living target and dead target respectively. At a 1:1 effector to target cell ratio lymphocytes from subjects of both sexes aged 18 to 40 years residing in the radiation belt showed a mean percent of 6.7 ± 0.5 (SE) target binders and 2.0 ± 0.2 (SE) killer cells respectively compared to a mean of 5.5 ± 0.4 (SE) binder and 1.6 ± 1.1 (SE) killer cells respectively from a similar age matched control population ($n=39$) residing in an area of normal background radiation. Our data therefore suggest that prolonged low level radiation did not significantly affect the in-vitro NK activity of lymphocytes. Further studies of NK specific suppressor cells, their soluble mediators or serum inhibitors will examine the effects of prolonged exposure of low level back-

ground radiation on tumour immune surveillance activities to determine its role in the relatively higher incidence of certain malignancies in the experimental population.

2) SEARCH FOR TISSUE SPECIFIC PLANT LECTINS

Dr. M. Krishnan Nair and Mr. T. Vijayakumar of the Research Division with the technical advice of Dr. J.A. Forrester of the Chester Beatty Laboratories, London have undertaken this interesting study. The objective of the programme is to examine a number of plant species for the presence of haemagglutinating lectins, to purify any lectins found and explore tissue staining specificities.

The following seeds were collected and screened for the presence of lectin by testing for haemagglutinating activity against erythrocytes of the human A,B and O phenotypes as well as sheep, rabbit and mouse erythrocytes.

1. *Artocarpus integrifolia* (Jack fruit),
2. *Psophocarpus tetragonolobus* (Winged bean),
3. *Thevetia nerifolia* (nerium),
4. *Trigonella foenumgraecum* (Trigonella),
5. *Nephelium litchi* (Litchi),
6. *Anacardium occidentale* (Cashew nut),
7. *Anon a reticulata* (Custard apple),
8. *Persea americana* (Avocado pear),
9. *Mangifera indica* (Mango).

It was found that out of the nine species screened only four of them, namely Jack Fruit, Winged bean, Avocado pear and Mango, contained lectin like activity when tested against the spectrum of erythrocytes listed above. These species were studied in detail.

Winged bean and jack fruit seed extracts were found to have high haemagglutinating titres and in each case the haemagglutinating activity was found to be best inhibited by N-acetyl-D-galactosamine out of a range of sugars tested. Most of the lectin-like activity was retained in the 60% ammonium sulphate fraction of the seed extract and therefore this fraction was collected, dissolved in PBS, dialysed against several changes of PBS and passed through a column of immobilized N-acetyl-D-galactosamine. No haemagglutinating activity was found in the non-adsorbed breakthrough peak. The adsorbed protein

was eluted with a solution of 50 mM N-acetyl-D-galactosamine in PBS. The eluted peak was dialysed exhaustively against distilled water and lyophilised. The physico-chemical properties of the lectins so prepared are studied.

The affinity purified lectins were then conjugated to HRP (horse radish peroxidase) type VI and their tissue staining properties studied using the DAB (diamino benzidine dihydrochloride) staining. Despite their apparently identical monosaccharide binding specificities as determined by inhibition studies these two lectin preparations differed profoundly in their ability to stain mammalian tissues. Winged bean lectin stained no tissues of either human or murine origin. Pretreatment of the tissues with neuraminidase (*V. cholerae*), which often reveals cryptic receptor sites for galactose/galactosamine recognizing lectins failed to promote staining with WBL. In contrast the Jack fruit lectin preparation stained a variety of tissues in both mouse and man.

The avocado pear and mango seed extract proved resistant to purification by comparable methods. No simple sugar inhibitor of haemagglutination could be found and the result of ammonium sulphate fractionation, gel filtration and ion exchange chromatography demonstrated that the haemagglutinating activity was present in fractions of widely varying molecular weight, precipitability and ionic strength. It seems probable that these polydisperse haemagglutinating materials are not lectins in the classical sense. It has been suggested by Statt et al (Statt, R.H. Langley, S.D. and Doyle, R.J. *Infect. Immun.* 27: 675:1980) that they may be polysaccharide in nature. Our observations on their chemical behaviour would agree with this suggestion. Because of their lack of specificity no extended attempts at purification were made.

3) STUDIES ON ORAL SUBMUCOUS FIBROSIS:

This is a collaborative study by the Regional Cancer Centre and the British Commonwealth Foundation. Dr. Babu Mathew and the staff of the Research Division will represent the former and Dr. N.W. Johnson the latter.

The sample of the study is all the submucous fibrosis cases detected in the area of Primary Health Centre, Thrikkadavoor. Observations will be made on the aetiology natural history of the development of the disease, immunology and intermediate end points. The immunological investigations will be done in this centre and that of the intermediate end points at the British Commonwealth Foundation Laboratory.

STUDIES ON ENVIRONMENTAL CARCINOGENESIS

It is widely accepted that 85-90% of human cancers are caused by environmental life style factors; for this reason it is only justifiable to assume that these cancers are preventable by appropriate modulation of environmental factors. This can be accomplished by the identification of cancer causing agents in the environment. By the elimination of these agents or by addition of agents in the environment which inhibit the carcinogenic potential of such compounds, cancers could in all likelihood be prevented.

Studies on causes and prevention of cancer are best accomplished in population with specific types of cancers at high risk. Such population exist in Kerala where the habit of pan-chewing (Tobacco, betel leaf, arecanut and lime) greatly increases the risk of oral cancer. A recent study from our centre reveals that more than 95% of oral cancer patients have an associated tobacco habit. The role of environmental factors mainly pan-chewing and diet in oral carcinogenesis is currently assessed by means of Collaborative Studies.

This is a joint research project by the Regional Cancer Centre and the environmental carcinogenesis unit of the British Columbia Cancer Research Centre, Vancouver, Canada. The Regional Cancer Centre group consists of Dr. M. Krishnan Nair Dr. Babu Mathew and Dr. R. Sankara Narayanan and the British Columbia Cancer Research Centre participants are Dr. H.F. Stich, Dr. Miriam Rosin and Mr. Antony Paul Hornby.

The objective of the study is determination of various life style/environmental factors responsible for causation of Oral

Cancer. In addition the study will determine the role of interventional strategies in the prevention of oral cancer which is a major problem in our population.

The following studies are currently being conducted:

(1) Role of Betacarotene in reducing oral leucoplakia/micronucleated cells in buccal mucosa of panchewers over a 6 month period.

(2) Observation on role of Folic acid in reducing the percentage of micronucleated cells in buccal mucosa of panchewers for 3 months.

(3) The efficacy of Vitamin A and Betacarotene combination to reduce oral precancerous lesions and micronucleated cells in panchewers.

(4) The role of diet as a modulator in carcinogenesis is examined in two dietary groups namely Non Vegetarians (Fisher folk from Vettucadu, Veli and Kannanthurai areas of Trivandrum City) and Vegetarians (Brahmins from Fort, Chalai and Karamana areas of Trivandrum City). Whether vegetarian diet could suppress carcinogenic potential of panchewing is being assessed cytologically and biochemically.

The above studies have an end point in determination of Vitamin A, Betacarotene and Folic acid in exfoliated cells of buccal mucosa and also observation of frequency reduction in lesions as well as micronucleated cells.

(5) One carcinogenic potential of panchewing is the presence of Nitroso compounds and their precursors. Estimation of these compounds is being made in the urine and saliva of panchewers and the actual chewing mixture (Pan quid).

(6) Supplementation with Ascorbic acid can block formation of N nitroso compounds endogenously in panchewers. This hypothesis is currently being tested.

(7) Biopsies taken from Oral Cancer patients attending Regional Cancer Centre are being analysed for oncogene proteins, oncogene DNA and Papilloma virus.

(8) Nutritional status of Vegetarian versus Non vegetarian diet will be studied to determine content of Vitamin precursors, Vitamins and other nutrients assumed to play a protective role in oral Carcinogenesis.

These are pilot studies to determine feasibility of long term intervention programmes for prevention of Oral Cancers.

Title	Principal investigator	Co-investigator	Funding Agency
1. Role of Tumour Associated Antigen in the total management of cancer of the tongue	Dr. M. Krishnan Nair Director	Dr. B. Prabha Asst. Professor	I.C.M.R.
2. Major Blood groups in human malignancies	Dr. M. Krishnan Nair Director	Dr. B. Prabha Asst. Professor	K.S.C.S.T.E. Government of Kerala.
3. Isolation, Purification and Physico-chemical properties of plant lectins and their clinical use in the diagnosis and /or treatment of cancer. (3 years from 1986)	Dr. M. Balaraman Nair, Director of Medical Education and Dr. M. Krishnan Nair, Director	T. Vijayakumar Sr. Research Officer K. K. Vijayan Lecturer	I.C.M.R.
4. Serum and tissue Immuno-globulin levels as Biological Markers in solid tumours. (3 years from 1985)	Dr. M. Krishnan Nair Director	Ravindran Ankethil Scientific Officer	K.S.C.S.T.E.
5. Isolation of circulating Immune Complexes and Characterisation of their constituent antigens and antibodies in the sera of cancer patients (3 years from 1986)	T. Vijayakumar Sr. Research Officer T. Vijayakumar Sr. Research Officer K. K. Vijayan Lecturer	 Nil	 K.S.C.S.T.E.

K.S.C.S.T.E., Kerala State Committee on Science, Technology and Environment.

RESEARCH PAPERS PUBLISHED/PRESENTED IN CONFERENCES ETC.

- Vijayakumar, T., Vasudevan, D.M. High affinity Rosette forming Cells in carcinoma of oral cavity, breast and cervix. Cancer letters - 27:339 - 1985.
- Vijayakumar, T., and Forrester, J.A. Isolation and Tissue Staining Characteristics of lectins from winged bean and jackfruit. Proc.Intern: Sym: on Impact of Biotechnology on diagnostics. pp:150 (1985).
- Vijayakumar, T., Raveendran Ankathil, Remani, P., Sasi-dharan, V.K., Vijayan, K.K. and Vasudevan, D.M. Serum Immunoglobulin in patients with carcinoma of oral cavity, uterine cervix. Cancer Immunol. Immunother 22:761 - 1986.
- Vijayakumar, T. Search for tissue specific plant lectins Ann: Conf: Society of Biological Chemists of India Pant-nagar - 1985.
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- Vijayakumar, T. Circulating immune complexes as biological markers in solid tumour - National Seminar Cum Workshop on Monoclonal antibodies - Madras. 1985.
- Vijayakumar, T. Immunological and Biochemical alterations in premalignant lesions of the oral cavity. IInd Biennial Conference. Ind: Soc: Onco: Bombay 1986.
- Mr. Vijayan .K. K. An Immunological Staining method using Lectins from the seeds of Jack-fruit. (Artocarpus integrifolia) - IInd Bine: Conf: Ind: Soc: Onco: 1986 Bombay.
- Raveendran Ankathil. Serum and Tissue immuno-globulin levels in pre-malignant and malignant lesions of the oral cavity. Ann: Conf: Ind: Coll: of Allergy and Applied Immunology - Calcutta - 1985.

10. Gangadharan, P., Cancer in Kerala. Epide: Symposium II. Bin. Conf: Ind: Soc: of Oncology, Bombay, Feb. 1986.
11. Ramachandran, T.P. Rectal Dosimetry in Selectron Treatments. VII Cong: of AROI. Bangalore - 1985.
12. Gopalakrishna Kurup, P.G. Faults and Breakdowns in Selectron LDR System Experiences. VII Cong: of AROI, Bangalore - 1985.
13. Lalitha Bai, M.K. Cytology Screening Programme for detection of carcinoma Utrine Cervix-Experience. 34th Ann: Conf: Ind: Assoc: Path: & Micro-bio. Udaipur - 1985.
14. Chandralekha, B., Sreedevi Amma, N., Lalitha Bai, M.K., Kumari Chandrika, B. Value of Cytology in the diagnosis of hepatic malignancies. Ann: Conf: I.A.P.M. Udaipur - 1985.
15. Lalitha Bai, M.K., Elizabeth Abraham. Adenoid Cystic carcinoma - Cytology IAPM - Trichur - 1985.
16. Ramachandran Nair, P. Ultrasound in tumour diagnosis A.I.S. Bio: Engi: Soc: India. Bombay 1985.
17. Ramachandran Nair, P. Unusual presentations encountered in an imaging department. Ann: Conf: Soc: Nuc: Med: 1985.
18. Ramachandran Nair, P. Neurone specific enolase - R.I.A. Ann: Conf: Soc: Nuc: Med: 1985.
19. Ramachandran Nair, P. T3 - Toxicosis - A review of cases. Ann: Conf: Soc: Nuc: Med: 1985.

This is incomplete.

For complete list see under each division also.

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

- | | |
|---|--|
| Dr. M. Krishnan Nair,
Director | Consultants meeting on Buccal Mucosal Cancer, New Delhi- August 1985 |
| -do- | A.R.O.I. meeting, Bangalore October 1985 |
| -do- | PAC/WHO-ICMR meeting, Bangalore October 1985 |
| -do- | International meeting of Cancer Registries, Hartford, U.S.A. December 1985 |
| -do- | I.S.O. meeting and TTP Brachytherapy, Bombay - February 1986. |
| Dr. M.K. Lalitha Bai
Asso. Prof. of Cyto-Pathology | Indian Association of Pathologists and Microbiologists, Udaipur- October 1985. |
| Dr. B. Chandralekha
Asst. Prof. of Cyto-Pathology | Indian Association of Pathologists and Microbiologists, Udaipur- October 1985. |
| Mr. R. Muraleedharan
Lab. Technician | Indian Academy of Cytologists, Lucknow - October 1985 |
| Dr. M.K. Lalitha Bai,
Asso. Prof. of Cyto-Pathology | -do- |
| Dr. B. Chandralekha
Asst. Prof. of Cyto-Pathology | -do- |
| Dr. P. Ramachandran Nair
Asso. Prof. of Nuclear Medicine | International Seminar on Recent Trends in Non-Invasive Organ Imaging at Institute of Nuclear Medicine and Allied Sciences, New Delhi - January 1986. |

-do-	XI All India Symposium-Cum-Workshop on Biomedical Engineering, Bombay-December 1985.	Shri. Raghu Ram K. Nair Lecturer in Nuclear Medicine Technology	International Seminar on Recent Trends in Non-Invasive Organ Imaging, Delhi-January 1986.
-do-	XVII Annual Conference of Society of Nuclear Medicine of India, Bangalore - January 1986.	Dr. Babu Mathew, Assoc. of Prof. Community Medicine	40th Indian Dental Conference Lucknow-29th Dec. 1985 to 1st Jan. 1986.
Shri. P.G. Gopalakrishna Kurup, Assoc. Professor of Radiation Physics.	VII Congress AROI, Bangalore. October 1985.	Shri. Raveendran Ankathil, Scientific Officer	First National Seminar cum Workshop on Monoclonals in Experimental and clinical Oncology-Madras, Dec. 1985.
Dr. T.P. Ramachandran, Assoc. Prof. of Radiation Physics.	-do-	Dr. M.K. Lalitha Bai Prof. of Cytology	IAPM Regional Chapter 1985, Trichur - December 1985.
Dr. S. Parameswaran, Asst. Prof. of Radiotherapy	VII Congress AROI, Bangalore - October 1985	Dr. Elizebeth K. Abraham Asst. Prof. of Pathology	-do-
Dr. V.N. Bhattathiri Asst. Prof. of Radiotherapy	-do-	Dr. S. Parameswaran Asst. Prof. of Radiotherapy	Indian Society of Head & Neck Oncology, Madras - January 1986.
Dr. P.G. Jayaprakash Asst. Prof. of Radiotherapy	-do-	Shri. T. Vijayakumar Senior Research Officer	2nd Biennial Conference Indian Society of Oncology Bombay - February 1986.
Mr. T. Vijayakumar, Senior Research Officer	Symposium on Biotechnological Strategies to improve Agricultural productivity - Nainital, Nov. 1985.	Shri. K.K. Vijayan Lecturer in Cancer Research	-do-
Dr.V.Padmanabhan, Asst. Prof. of Physics	International Seminar in Medical Imaging, Madras-January 1986.	Dr. C.S. Rafeeka Beegum Asst. Prof. of Radiotherapy	-do-
Dr. V.M. Pradeep Lecturer in Nuclear Medicine	-do-	Dr. Babu Mathew Assoc. Prof. of Community Medicine	Workshop on Cancer for NSS key personnel of Southern States Bangalore - Jan.1986
Shri. Raveendran Ankathil Scientific Officer	XIX Annual Convention of the Indian College of Allergy & Applied Immunology, Calcutta - December 1985.	Dr. P. Kusuma Kumari Tutor in Paediatric Oncology	Symposium/Workshop - Foetal Liver Transplantation, Delhi - February 1986.
		Dr. Sabarinathan K., Assoc. Prof. of Paediatrics	-do-

Dr. P.G. Jayaprakash
Asst. Prof. of Radiotherapy } Technology Transfer Programme
on Cancer of the Uterine
Cervix - Delhi February 1986.

Dr. T. Gangadevi
Asst. Prof. of Radiotherapy } -do-

Shri. K.B. Hari, Radiographer } Training Course on Radiation
Shri. Georgey Mathews " } Protection in the Medical
Shri. T. Prasad " } use of Radiation, Delhi-
Smt. Raheena Beegum " } February 1986.

Dr. Gladys Jeevy
Anaesthetist } T.T.P. Workshop on Pain
Relief- Gujarat Cancer
Institute, Ahmedabad
February 1986

Dr. Paul Sebastian
Lecturer in Cancer Surgery } -do-

D. Suresh Chandra Dutt
Asst. Prof. of Radiotherapy } -do-

Dr. C.S. Madhu,
Tutor in Radiotherapy } T.T.P. Workshop on
Brachytherapy, Bombay
February 1986.

Dr. V.N. Bhattathiri
Asst. Professor of Radiotherapy } -do-

Dr. Thomas Cherian
Asst. Prof. of Cancer Surgery } Workshop in Breast Cancer,
New Delhi - February 1986.

Dr. P.R. Sasindran,
Tutor in Radiotherapy } -do-

Shri. P. Gangadharan
Assoc. Prof. of Cancer
Epidemiology (Statistical) } Conference of Indian
Society of Oncology,
Tata Memorial Hospital,
Bombay, Feb. 1986.

Dr. C.S. Rafeeka Beegum
Asst. Prof. of Radiotherapy } Transfer Technology
Programme in Lymphomas,
Leukaemia, Paediatric
Malignancies, Bangalore &
Madras - Feb. 1986.

Dr. P. Kusuma Kumari,
Tutor in Paediatric Oncology } -do-

Shri. P.G. Gopalakrishna Kurup
Assoc. Professor of Radiation
Physics.

Workshop on quality control
in diagnostic Radiology,
A.I.I.M.S., New Delhi-
March 1986.

International symposium
on the impact of Biotechnol-
ogy on Diagnostics Rome,
April 1985

Dr. T.K. Padmanabhan,
Superintendent.

2nd Biennial Conference
Indian Society of Oncology
Bombay - Feb. 1986.

and

T T P workshop in
Breast cancer,
New Delhi-Feb. 1986.

Dr. Jayaprakash Madhavan
Tutor, Radiotherapy
Dr. S. Parameswaran
Asst. Prof. Radiotherapy
Mr. Muralaedharan Nair
Medical Statistician
Ms. G. Padmakumari
Junior Res. Fellow

Transfer of Technology
Programme on Cancer
Epidemiology Prevention and
control Trivandrum,
Feb. 1986.

DISTINGUISHED VISITORS

1. Dr. R.S. Mani
Radio Pharmaceutical Division
BARC, Bombay.
2. Dr. R. Sripathmanathan
Oral and Maxillofacial Surgeon
Consultant
University of Glasgow
U. K.
3. Dr. Valentin Koroltechook
Cancer Unit
W. H. O.
Geneva.
4. Dr. & Ms. Samuel Taylor
Rush Presbeterian—St Luke Medical Centre
Chicago.
5. Dr. Miriam P Rosin
British Columbia Cancer Control System
Vancouver
Canada.
6. Dr. J.A. Forrester
Chester Beatty Laboratories —
Royal Marsden Hospital,
London.
7. Prof. N.W. Johnson
Royal College of Surgeons of England
London.
8. Prof. E.J. Ambrose
Commonwealth Foundation
England.
9. Dr. Judith M Deacon
Institute of Cancer Research &
Royal Marsden Hospital
Sutton
England.

10. Dr. G. Gordon Steel
Institute of Cancer Research
Sutton
England.
11. Dr. John Yarnold
Royal Marsden Hospital & Institute of Cancer Research
Sutton
England.
12. Dr. Calvin Zippin
Director, Cancer Registry
Medical Centre,
San Francisco.
13. Dr. Habibuz Zaman,
Regional Director
W.H.O. Regional Office
New Delhi.
14. Dr. A.B. Miller
Director
Epidemiology Unit
National Cancer Institute of Canada
Ontario
Canada.
15. Dr. T. Hirayama
Epidemiologist & Director
Institute of Preventive Oncology
Tokyo
Japan.
16. Dr. L.D. Sanghvi,
Project Officer
National Cancer Registry
I.C.M.R.
New Delhi.

ADMINISTRATION

GOVERNING BODY MEMBERS OF THE REGIONAL CANCER CENTRE SOCIETY, TRIVANDRUM.

- Shri. K. Karunakaran, : Chairman
Chief Minister of Kerala &
Minister for Health (in charge)
- Shri. M.G.K. Murthy, I.A.S.,
Secretary to Government,
Health Department,
Government of Kerala
and : Vice Chairman
- Shri. V. Krishna Murthy, I.A.S.,
Secretary to Government,
Health Department,
Government of Kerala.
- Shri. K.V. Rabindran Nair, I.A.S.
Commissioner for Economic
Development & Secretary to Govt.
Department of Finance,
Government of Kerala. : Member
- Dr. A.K. Bhattacharya MD,
Director-General of Health
Services, Nirman Bhavan,
New Delhi. : Member
- Dr. V.R. Gowariker, Ph.D.,
Director, Vikram Sarabhai
Space Centre, Trivandrum
and : Member
- Dr. S.C. Gupta, Director,
Vikram Sarabhai Space Centre,
Trivandrum.

- Dr. M.S. Valiathan, Director,
S.C.T.I.M.S.T., Trivandrum : Member
- Dr. C.V. Korah, MD.,
Director of Medical
Education, Trivandrum : Member
- Dr. M. Balaraman Nair, MD,
Principal, Medical College,
Trivandrum : Member
- Mrs. Suma Subbanna,
Deputy Secretary Ministry o
Health & Family Welfare Dept.,
Govt. of India, Nirman Bhavan,
New Delhi. : Member
- Seniormost Pathologist in the
Medical College Services,
Kerala. : Member
- Dr. M. Krishnan Nair, MD.,FRCR,
Director, Regional Cancer
Centre, Trivandrum. : Convener

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

Shri. M.G.K. Murthy, I.A.S.,
Secretary to Government,
Department of Health,
Government of Kerala

and : Chairman

Shri. V. Krishnamurthy, I.A.S.,
Secretary to Government,
Department of Health,
Govt. of Kerala

Shri. K.V. Rabindran Nair, I.A.S.,
Commissioner for Economic Development
& Secretary to Government
Department of Finance,
Govt. of Kerala

: Member

Dr. M. Balaraman Nair, MD.,
Principal, Medical College
Trivandrum.

: Member

Dr. M. Krishnan Nair, MD, FRCR,
Director, Regional Cancer Centre,
Trivandrum.

: Convener.

**SCIENTIFIC COMMITTEE MEMBERS OF THE
REGIONAL CANCER CENTRE SOCIETY, TRIVANDRUM**

Dr. Sundaram MD.,
Head, Biomedical Division,
BARC, Bombay.

: Chairman

Dr. M. Balaraman Nair, MD.,
Principal Medical College,
Trivandrum.

: Vice-Chairman

Dr. M.S. Valiathan, MS, FRCS, FAMS
Director, Sree Chitra Tirunal
Institute for Medical Science
and Technology, Trivandrum.

: Alternate
Vice-Chairman

Dr. N. Lakshmypathy, MD.,
Director,
Institute of Nuclear Medicine &
Allied Sciences, Delhi.

: Member

Dr. (Mrs) G. Sudha Gangal, Ph.D.,
Head, Division of Immunology,
Tata Memorial Hospital, Bombay.

: Member

Dr. Renadev, Ph.D.,
Retd. Director,
Cancer Research Institute,
Tata Memorial Centre, Bombay.

: Member

Dr. Jayaram Panicker, MD,
Principal, Medical College,
Calicut.

: Member

Dr. Yagnanarayanan Iyer, Ph.D.,
Prof. of Biochemistry,
St. John's Medical College,
Bangalore.

: Member

Dr. J. Stephen, Ph.D.,
Head, Research Division,
Regional Cancer Centre, Trivandrum. : Member

Dr. M.K. Lalitha Bai, MD.,
Prof. of Cytology,
Regional Cancer Centre,
Trivandrum. : Member

Dr. T.P. Ramachandran, Ph.D.,
Associate Professor of Radiation
Physics, Regional Cancer Centre,
Trivandrum. : Member

Dr. P. Ramachandran Nair, MNAMS,
Head, Nuclear Medicine Division
Regional Cancer Centre,
Trivandrum. : Member

Dr. M. Krishnan Nair, MD., FRCR,
Director, Regional Cancer Centre
Trivandrum. : Member

Dr. M. Thangavelu, MD.,
Dean, P.S.G. Institute of Medical Sciences,
Coimbatore. : Member

Dr. T.K. Padmanabhan, MD.,
Superintendent,
Regional Cancer Centre,
Trivandrum. : Convener

BUILDING COMMITTEE MEMBERS OF THE REGIONAL CANCER CENTRE SOCIETY, TRIVANDRUM

Shri.E.Kurien,
Chief Engineer,
P.W.D. (Buildings)
Trivandrum.

Dr.C.V.Korah,
Director of Medical Education,
Trivandrum.

Shri.M.Ramaswamy Iyer,
Chief Architect,
Public Works Department,
Trivandrum.

Dr.M.Balaraman Nair,
Principal, Medical College,
Trivandrum.

Dr.M.Krishnan Nair,
Director,
Regional Cancer Centre,
Trivandrum.

Shri.Joseph Stephen,
Finance and Accounts Officer,
Regional Cancer Centre,
Trivandrum.

Shri.G.Gopalakrishnan Nair,
Chief Construction Engineer,
Regional Cancer Centre,
Trivandrum.

MAJOR DECISIONS OF THE GOVERNING BODY IN THE YEAR 1985-86

The Governing Body resolved to include Prof.M.Thangavelu, former Adviser on Non-Communicable Diseases, Regional Office for South East Asia, World Health Organization, New Delhi also as one of the members of the Scientific Committee.

It was resolved that while filling up the posts in the Regional Cancer Centre with the Director of Medical education staff, who have exercised option in favour of the Regional Cancer Centre Society Service and who have since been selected to these posts the following service condition will be offered to them.

(a) They will have the choice to select pensionable service as in Government or non-pensionable service in the Regional Cancer Centre.

(b) Their total service in the Directorate of Medical Education will be counted for fixation of pay, Seniority and pensionary benefits.

(c) For fixing their seniority viz-a-viz Regional Cancer Centre staff who have been directly recruited through open advertisement from the Directorate of Medical Education service, the original seniority in the Directorate of Medical Education service will be taken as the criteria.

(d) To enable implementation of these resolutions Governing Body resolved to authorise the Executive Committee to create necessary supernumerary posts within the approved overall staff scheme of the Regional Cancer Centre Society.

The Governing Body resolved to raise the age of superannuation to 60 years for academic staff and 58 years for non-academic staff.

The Governing Body approved the constitution of a Research Advisory Committee with the following members:-

1. Dr.M.Balaraman Nair,
Principal, Medical College,
Trivandrum. : Chairman

2. Dr.Sudha Gangal, Head
Immunology Division,
Tata Memorial Centre, Parel,
Bombay. : Member.
3. Dr.M.S.Valiathan,
Director, S.C.T.I.M.S.T.,
Trivandrum. : Member
4. A.V.Lakshmanan,
Assistant Director and
Scientific Director,
Cancer Institute,
Adayar, Madras. : Member
5. Dr.M.Krishnan Nair,
Director, Regional
Cancer Centre, Trivandrum. : Member
6. Prof.A.Joseph,
Secretary (Academic)
Regional Cancer Centre,
Trivandrum. : Secretary and
Co-ordinator

The Governing Body resolved to approve the proposal to construct the research block using the Science and Technology grants with suitable modification of the approved conceptual plans and also to accept the proposal of the KHRWS to construct paywards for cancer patients.

The Governing Body approved delegation of powers to the Director, Regional Cancer Centre.

They also resolved to extend the travel rules of the Government of Kerala to the Regional Cancer Centre Society employees.

Governing Body resolved to approve the membership scheme for cancer relief to the public entitled the "Cancer Care For Life" of the Regional Cancer Centre Society and sanctioned an amount of Rs.1.5 lakhs initially for propagating this scheme.

At a special meeting of the Governing Body on 27-2-1986 it was resolved to amend the memorandum of association and the rules relating to the Regional Cancer Centre Society to include Chief Minister of Kerala in the Governing Body as its Chairman and Director of Medical Education as member in the Executive Committee.

Major decisions of the Executive Committee

The Executive Committee approved the purchases of X-ray unit with mobile intensifier and mammogram.

The Committee created the posts in Radiation Physics Department, Cancer Surgery Department, Nuclear Medicine Department and upgraded the posts in the Research Division taking into consideration the requirements of the centre. The committee also created a post of computer programmer and systems analyst to ensure utilisation of the two computers already installed in the Regional Cancer Centre. One post of Secretary (Academic) was created. He will be in charge of the academic matters of the Regional Cancer Centre.

The following persons joined in the posts which were created during the year.

Post	Name of the person
Cytotechnologists (2 posts)	1. Molykutty John
	2. Ravindran Pillai

The Executive Committee resolved to redesignate all posts of tutors in the staff scheme of the Regional Cancer Centre Society as Lecturer, so that persons with post graduate qualification could be appointed. They will be given 3 advance increments considering the 3 years spent for postgraduate course.

The Committee approved the implementation of the Collaborative programme in academic and Scientific activities between the Christie Hospital and Holt Radium Institute, Manchester and the Regional Cancer Centre, Trivandrum.

The Committee resolved to appoint the following persons as Consultants in the Regional Cancer Centre paying an honorarium of Rs. 300/- P.M. to each of them.

- | | | |
|-----|--|--|
| (1) | Dr. M. Balaraman Nair,
Principal, Medical College,
Trivandrum. | — Cancer Research &
Histopathology. |
| (2) | Dr. V.G. Chellam,
Prof. of Pathology,
Medical College,
Trivandrum. | — Paediatric Onco-
Pathology. |
| (3) | Dr. Roy Varghese,
Assoc. Prof. of Infectious
Diseases, Medical College,
Trivandrum. | — Infectious disease |

The Committee permitted Dr. V.M. Pradeep, Lecturer in Non-Invasive Imaging, Regional Cancer Centre to attend the International Atomic Energy Agency, Regional Training Course on Medical Radio Immunoassay which was held at Beijing, China in October 1985. Dr. M. Krishnan Nair, Director, Regional Cancer Centre participated in the meeting of the International Association of Tumour Registries in Hartford, Connecticut, U.S.A. which was held in December 1985.

The Committee resolved to implement the pay revision order issued by the Government of Kerala in the Regional Cancer Centre, Trivandrum with effect from 1-1-1986.

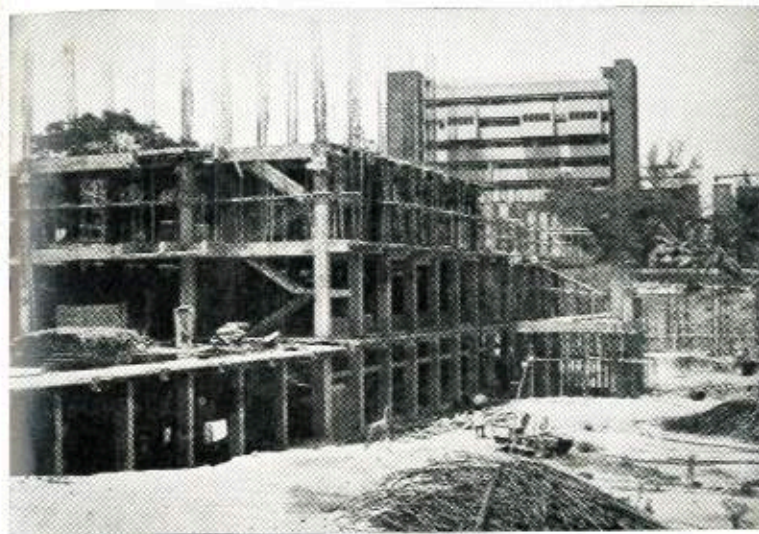
ENGINEERING DEPARTMENT

The Engineering Department was constituted with the appointment of Shri. G. Gopalakrishnan Nair, Executive Engineer of P.W.D. on 1-10-1983 as Project Administrator of the Regional Cancer Centre on deputation basis. The Project Administrator is also the Convener of the Building Committee which was constituted by the Governing Body for the specific purpose of controlling, planning and administering the construction activities of the Regional Cancer Centre Building Project. The first meeting of the Building Committee was on 18-10-1983 and later they met at least once a month.

The Building Committee selected the present site for the Regional Cancer Centre Building and appointed M/s. K.G. Sukumaran, and Associates, Cochin as the Consultant Architect for the project. The Architects signed the contract for the first phase of the building on 15-6-1984. Shri. K. Karunakaran, Chief Minister of Kerala laid the foundation stone of the Building on 11-9-1984.

The Building Committee decided to take up the entire project simultaneously based on the conceptual plan and rough cost estimate for Rs. 950 lakhs prepared by the Architect.

Since there were some constraints of funds it was decided at the meeting on 10-1-85 to construct only the Entrance Block, Utility Block, Ground Water Tank and some site Development work as first phase of the project. The Entrance Block is meant to accommodate the diagnostic and Imaging Equipments, the O.P. Consultation rooms, Minor Operation Theatres and the Nuclear Medicine Department. The total area is almost 3500 sq. metre in five floors. The Utility Block is a two-storeyed structure having an area of 1450 sq. meter approximately. When the whole project is completed the Utility Building will accommodate the Kitchen, Cafeteria, Canteen, Workshop etc. But now as a temporary measure, it is being used along with the Entrance Block to supplement the O.P. services and accommodates the Library and Laboratories in the basement floor and



Regional Cancer Centre building. Construction work making rapid progress.

Medical Records, Blood Bank, Chemotherapy and some office space in the Ground floor.

The site development works mainly consists of R.C.C. retaining walls, filling and construction of internal roads. The construction of 500 M³ capacity water ground storage tank for storing water for firefighting purposes as well as drinking purposes of the complete project is also included in the Site Development Works.

The civil works for the 1st phase was awarded to M/s. P. Ratnaswamy, Contractors & Engineers, Trivandrum and they had started the work on 15-6-85. The work is in progress and it is expected to complete all civil works by the end of 1986.

The tenders for electrification, Airconditioning and P.H. works are being prepared. It is expected that the whole building will be ready for occupation by the end of March 1987.

The designation of the Project Administrator has since been changed to Chief Construction Engineer. One Assistant Executive Engineer and two Assistant Engineers from P.W.D. were appointed on deputation as Project Engineer Assistant Project Engineer to assist Chief Construction Engineer in construction activities.

The estimated cost of phase I, is Rs. 217 lakhs. It was originally proposed to aircondition only a portion of the Entrance Block. Subsequently it was decided to air condition the Entrance Block completely. The revised proposal, the increased cost of services such as electrification etc., and the tender excess will enhance the overall expenditure of the project.

ACCOUNTS
REGIONAL CANCER CENTRE SOCIETY,
BALANCE SHEET AS AT

LIABILITIES	Rs.	P.	Rs.	P.
CAPITAL FUND				
As per last Balance Sheet	121,33,792.	32		
Add: Transfer of Capital Grant: Central Government Grant	49,43,210.	09		
State Government Grant	92,32,406.	92		
			2,63,09,409.	33
CAPITAL GRANT				
Unspent balance of grant received from Government of India as per last Balance Sheet.	14,43,210.	09		
Less: Amount utilised for purchase of equipments during 1985-86 transferred to Capital Fund.	14,43,210.	09		
Capital grant received from Govt. of India, Ministry of Health & Family Welfare, New Delhi. IIIrd & Final Instalment of grant for 1984-85 as per letter No.V 22015/2/84-R dt. 11-4-1985.	10,00,000.	00		
Ist Instalment of grant for 1985-86 as per letter No.V-22015/6/85-R dated 18-7-1985.	4,16,000.	00		
IInd Instalment of grant as per letter No.V-22015/6/85-R dt.4-12-85.	20,84,000.	00		
	35,00,000.	00		
Less: Amount utilised for purchase of equipment and construction of building transferred to capital fund.	35,00,000.	00		
TOTAL				

TRIVANDRUM (REGN. No. 567/81)

31ST MARCH, 1986.

ASSETS	Rs.	P.	Rs.	P.
FIXED ASSETS				
As per Schedule			2,16,21,296.	93
CURRENT ASSETS				
Closing Stock of Chemicals Sundry Medical items etc.	69,171.	18		
Advances	10,97,475.	37		
Accounts Receivable	200.	00		
Deposit with Telephone Department	7,000.	00		
Cash in hand	2,836.	50		
Stamps in hand	147.	05		
Balance with State Bank of Travancore in SB A/c.No. 9610	83,421.	21		
Balance with Government Treasury SB A/c. No. TPA 675(A)	824.	70		
Interest	1,150.	00		
			12,62,226.	01
TOTAL				

**REGIONAL CANCER CENTRE SOCIETY,
BALANCE SHEET AS AT**

LIABILITY	Rs.	P.	Rs.	Ps.
Grant in kind from Government of Kerala being value of equipments as per letter No.G.O.Rt. 1123/83/HD dt. 8-4-1985	80,44,166.	00		
Less: Transferred to Capital Fund.	80,44,166.	00		
Part of State Government Grant Capitalised.	11,88,240.	92		
Less: Amount utilised for purchase of capital assets transferred to Capital fund.	11,88,240.	92		
SUNDRY CREDITORS			6,27,672.	00
RESEARCH SCHEME				
Unspent balance of grant			46,315.	15
TOTAL			2,69,83,396.	48

Trivandrum,
25-8-1986.

**TRIVANDRUM (REGN. No. 567/81)
31ST MARCH, 1986.**

ASSETS	Rs.	P.	Rs.	P.
INCOME AND EXPENDITURE ACCOUNT				
Balance as per last Balance Sheet			18,28,880.	61
Add: Excess of expenditure over income for the year.			22,70,992.	93
			40,99,873.	54
TOTAL			2,69,83,396.	48

As per our report of even date.

Sd/-
POTTI & RAO,
Chartered Accountants.

REGIONAL CANCER CENTRE SOCIETY,
INCOME AND EXPENDITURE ACCOUNT

EXPENDITURE	Rs.	P.	Rs.	P.
To Opening Stock of Chemicals, Films etc.			35,780.	40
" Purchase of Chemicals, Films etc.			5,07,125.	50
" Salaries & Allowances			12,40,612.	47
" Printing & Stationery			51,301.	60
" Purchase of Medicines			2,47,751.	86
" Nuclear & Radiotherapy Isotapie Purchase			1,66,275.	00
" Travelling Expenses			81,741.	75
" Postage, Telegram & Telephone			49,478.	35
" Advertisement			35,350.	00
" Repairs & Maintenance:				
Equipments	2,18,666.	75		
Building		8,542.	50	
Vehicles		36,579.	20	
			2,63,788.	45
" Rent			40,000.	00
" Uniforms			6,357.	45
" Audit Fee			4,000.	00
" Electricity charges			819.	00
" Miscellaneous Expenses			16,938.	90
" Conferences, Seminars, Consultants, Workshop Expenses,			23,601.	65
" Early Cancer Detection Centre Expenses.			11,180.	15
" IInd Tumour Registrar's training Programme: Expenses		34,008.	35	
Less: Amount received from ICMR	15,000			
Contribution from Delegates	2,600			
		17,600.	00	
			16,408.	35
C/o			27,98,510.	88

TRIVANDRUM (REGN. No. 567/81)
FOR THE YEAR ENDED 31ST MARCH, 1986.

INCOME	Rs.	P.	Rs.	P.
By Grant from Government of Kerala Health Department received during the year.				
Ist Instalment as per letter No. G.O. Rt.2183/85/HD dt. 18-6-1985.		15,00,000.	00	
IInd Instalment as per letter No. G.O. Rt.3168/85/HD dt. 10-10-1985.		15,00,000.	00	
IIIrd Instalemtn as per letter No.G.O. Rt.752/86/H & FWD dt. 13-3-1986		5,00,000.	00	
IVth Instalment as per letter No.G.O. Rt.948/86/FWD & H dt. 26-3-86.		5,00,000.	00	
		40,00,000.	00	
Less: Part of the grant capitalised and transferred to Balance Sheet.		11,88,240.	92	
			28,11,759.	08
" Sale of Medicines			16,993.	10
" Investigation fee received			3,78,353.	05
" Interest received			17,800.	10
" Miscellaneous Receipts			12,409.	61
" Closing Stock of Chemicals, Films & Sundry Medical items etc.			69,171.	18
" Excess of Expenditure over Income for the year			22,70,992.	93
C/o			55,77,479.	05

EXPENDITURE	Rs.	P.	Rs.	P.
B/f			27,98,510.	88
By Radio Biology course Expenses	4,526.	75		
Less: Contribution from delegates	1,200.	00		
			3,326.	75
.. Technology transfer programme expenses	34,921.	45		
Less: Contribution from Indian Society of oncology.	25,000.	00		
			9,921.	45
.. Depreciation			27,65,719.	97
TOTAL			55,77,479.	05

INCOME	Rs.	P.
B/f	55,77,479.	05
TOTAL	55,77,479.	05

AUDITOR'S REPORT

We have verified the above Income and Expenditure Account of Regional Cancer Centre Society, Trivandrum for the year ended 31st March, 1986 and the annexed Balance Sheet as at 31st March, 1986 with the books of account, vouchers and other records produced before us and we certify the same to be correct as disclosed by the said records.

Trivandrum,
25-8-1986.

Sd/-
POTTI & RAO,
Chartered Accountants

POTTI & RAO
Chartered Accountants

S.R. Buildings,
Aryasala Jn.,
Trivandrum - 695036.

25-8-1986.

UTILISATION CERTIFICATE

Certified that the total grant of Rs. 40,00,000/- (Rupees Forty lakhs only) received by the Regional Cancer Centre Society, Trivandrum (Re. No. 567/81) from the Health (J) DEPARTMENT, Government of Kerala, as per G.O. Rt. 2183/85/HD dated 18-6-1985, G.O. Rt. 3168/85/HD dated 10-10-1985, G.O. Rt. 752/86/FWD dated 13-3-1986 and G.O. Rt. 948/86/FWD & H dated 26-3-1986 has been utilised by the Society during the year 1985-86 for the purpose of Chemotherapy and Nuclear Medicine and allied services and for the purpose of maintenance of the institution and other working expenses, implementation of projects, construction of buildings etc. and in connection with the functioning of the Early Cancer Detection Centres.

Sd/-
POTTI & RAO
Chartered Accountants.

POTTI & RAO
Chartered Accountants

S.R. Buildings,
Aryasala Jn.,
Trivandrum - 695036

25-8-1986.

UTILISATION CERTIFICATE

Certified that the final instalment of grant of Rs.10,00,000/- (Rupees Ten Lakhs only) for the year 1984-85 received by the Regional Cancer Centre Society, Trivandrum (Reg.No.567/81) during the year 1985-86 from the Ministry of Health and Family Welfare, Government of India, as per letter No.V-22015/2/84-R dated 11-4-1985 has been utilised for purchase of equipments and construction of building during the year 1985-86.

Sd/-
POTTI & RAO
Chartered Accountants

POTTI & RAO
Chartered Accountants

S.R. Buildings,
Aryasala Jn.,
Trivandrum - 695036
25-8-1986.

UTILISATION CERTIFICATE

Certified that the grant of Rs. 25,00,000/- (Rupees Twenty-five lakhs only) received by the Regional Cancer Centre Society, Trivandrum (Reg. No. 567/81) during the year 1985-86 from the Ministry of Health and Family Welfare, Government of India, as per letters No. V-22015/6/85-R dated 18-7-1985 and 4-12-1985 has been utilised for purchase of equipments and construction of building during the year 1985-86.

Sd/-
POTTI & RAO
Chartered Accountants

POTTI & RAO
Chartered Accountants

S.R. Buildings,
Aryasala Jn.,
Trivandrum - 695036
25-8-1986.

UTILISATION CERTIFICATE

Certified that out of the total grant of Rs. 20,00,000/- (Rupees Twenty lakhs only) received by the Regional Cancer Centre Society, Trivandrum (Reg. No. 567/81) from the Ministry of Health and Family Welfare, Government of India, as per letters No. V-22015/2/84-R dated 4-6-1984 and 11-1-1985, the Society has utilised Rs. 5,56,789.91 (Rupees 5 Lakhs fifty-six thousand seven hundred and eighty-nine and ninety one paise only) for purchase of equipments during the year 1984-85 and the balance Rs. 14,43,210.09 (Rupees Fourteen lakhs forty-three thousand two hundred and ten and nine paise only) for purchase of equipments and construction of building during the year 1985-86.

Sd/-
POTTI & RAO
Chartered Accountants

REGIONAL CANCER CENTRE SOCIETY, TRIVANDRUM (REGN. No. 567/81)
Schedule of Fixed Assets as on 31st March 1986

PARTICULARS	W. D. V. as on 1-4-1985	Additions during the year	Deductions during the year	Balance as on 31-3-1986	Rate	Depreciation for the year	W. D. V. as on 31-3-1986
1. Building (under construction)	2,84,367.10	41,63,542.18	—	44,47,909.28	—	—	44,47,909.28
2. Furniture & Fixtures	2,48,526.00	1,17,905.40	—	3,66,431.40	10	36,643.40	3,29,788.00
3. Office Equipments	1,06,149.00	9,447.95	—	1,15,596.95	15	17,339.95	98,257.00
4. Vehicles	36,389.00	90,293.00	—	1,26,682.00	20	25,336.00	1,01,346.00
5. Library Books	1,19,050.00	68,936.50	—	1,87,986.50	10	18,798.50	1,69,188.00
6. Hospital & Laboratory Equipments (Installed)	60,52,682.00	1,17,31,333.12	—	1,77,84,015.12	15	26,67,602.12	1,51,16,413.00
7. Hospital & Laboratory Equipments (Not Installed)	24,48,245.38	4,98,285.40	24,48,245.38	4,98,285.40	—	—	4,98,285.40
8. Capital Work-in-progress	8,51,860.25	8,250.00	—	8,60,110.25	—	—	8,60,110.25
TOTAL	1,01,47,268.73	1,66,87,993.55	24,48,245.38	2,43,87,016.90		27,65,719.97	2,16,21,296.93

- Notes: 1. No depreciation has been provided on Building under construction, capital work-in-progress & uninstalled equipments.
 2. The deduction of Rs. 24,48,245.38 under Hospital & Laboratory Equipments Uninstalled represents equipments installed during the year & transferred to installed account.
 3. Equipments transferred from uninstalled account. Equipments purchased & installed during the year. Equipments transferred by State Government.
- | |
|-----------------------|
| 24,48,245.38 |
| 12,38,921.74 |
| 80,44,166.00 |
| 1,17,31,333.12 |
- Total Equipments installed during the year
4. Capital Work-in-progress has not been transferred to Building Account, since completion certificates etc, have not been received from the Public Works Department.

Sd/-
POTTI & RAO
 CHARTERED ACCOUNTANTS

STAFF

Director	—	Dr. M. Krishnan Nair
Superintendent	—	Dr. T.K. Padmanabhan
Secretary (Academic)	—	Prof. A. Joseph
RADIOTHERAPY		
Dr. M. Krishnan Nair	—	Professor
Dr. T.K. Padmanabhan	—	Professor
Dr. F. Joseph	—	Associate Professor
Dr. B. Rajan	—	Associate Professor
Dr. T. Gangadevi	—	Assistant Professor
Dr. C.S. Kuttappan	—	Assistant Professor
Dr. G. Suresh Chandra Durt	—	Assistant Professor
Dr. P. G. Jayaprakash	—	Assistant Professor
Dr. S. Parameswaran	—	Assistant Professor
Dr. C.S. Rafeeka Beegum	—	Assistant Professor
Dr. V. Narayana Bhattachari	—	Assistant Professor
Dr. Jayaprakash Madhavan	—	Tutor
Dr. C. S. Madhu	—	Tutor
Dr. A. Sudhakaran	—	Tutor
Dr. P.R. Sasindran	—	Tutor
Dr. K. Ramesan	—	Lecturer
DENTAL SECTION		
Dr. L. Sudha	—	Tutor
Dr. K.R. Nalinakumari	—	Lecturer
Smt. M. Krishnambal	—	Dental Hygienist
Shri. P.R. Chandrasekharan Nair	—	Dental Hygienist
NUCLEAR MEDICINE		
Dr. P. Ramachandran Nair	—	Associate Professor
Dr. V. Padmanabhan	—	Assistant Professor
Dr. V.M. Pradeep	—	Lecturer
Shri. Raghu Ram K. Nair	—	Lecturer

RADIATION PHYSICS

Dr. T.P. Ramachandran	—	Associate Professor
Shri. P.G. Gopalakrishna Kurup	—	Associate Professor
Shri. C.A. Davis	—	Assistant Professor
Smt. B. Vimala	—	Radiographer
Shri. N. Sadasivan Nair	—	"
Smt. Suseelamma	—	"
Shri. V. Gangadharan Nair	—	"
Smt. P. Seetha	—	"
Shri. C. Viswanathan	—	"
Smt. M. Leela	—	"
Shri. Georgy Mathews	—	"
Smt. Raheena Beegum	—	"
Smt. V. Sheela	—	"
Shri. S. Sreenivasan	—	Radium Technician
Smt. Valsalakumari Amma	—	Radiographer
Shri. Joe D'Cruz	—	Radiographer
Shri. K.P. Radhakrishnan	—	Radiographer
Shri. K.B. Hari	—	Radiographer
Smt. P. Sujatha	—	Radiographer
Shri. T. Prasad	—	"
Shri. David Raj	—	"

CYTOLOGY

Dr. M.K. Lalitha Bai	—	Professor
Dr. B. Chandralekha	—	Assistant Professor
Dr. B. Kumari Chandrika	—	Assistant Professor
Dr. Elizabeth K. Abraham	—	Assistant Professor
Smt. J. Ambikakumari	—	Senior Scientific Officer
Shri. G. Reghunathan Nair	—	Cytologist
Shri. K. Vijayagopal	—	Junior Research Officer
Shri. P. Gopalakrishnan	—	Research Assistant
Smt. J. Usha	—	Cytotechnician
Smt. K.S. Ponnamma	—	Laboratory Technician Gr. I
Sri R. Muraleedharan	—	Cytotechnologist
Smt. Anandavally	—	Laboratory Technician Gr. II
Smt. S. Najeeya	—	—do—
Smt. Sathy Ammal	—	U.D. Typist
Sri S. Venugopal	—	Technician

Cancer Surgery:

Dr. Thomas Cherian	—	Assistant Professor
Dr. Gladys Geevy	—	Anaesthetist
Dr. Paul Sebastian	—	Lecturer
Dr. Iqbal Ahamed	—	Lecturer
Smt. S. Geetha	—	Staff Nurse
Smt. P.A. Baby	—	Staff Nurse

Paediatric Oncology:

Dr. P. Kusumakumary	—	Lecturer
Smt. P.M. Aleykutty	—	Nurse

Cancer Research:

Dr. J. Stephen	—	Associate Professor
Dr. B. Prabha	—	Assistant Professor
Mr. T. Vijayakumar	—	Senior Research Officer
Mr. K.K. Vijayan	—	Lecturer
Mr. Raveendran Ankathil	—	Scientific Officer
Mr. Thomas Abraham	—	—do—
Smt. B. Padmavathy Amma	—	Technical Officer
Sri. P. Robinson	—	Laboratory Technician Gr. II
Smt. C. Ganga Devi	—	—do—
Smt. A. Leela	—	Animal House Keeper-cum-Attender.
Smt. K. Vikraman Nair	—	—do—

Hospital Cancer Registry and Medical Records:

Sri. P. Gangadharan	—	Associate Professor of Cancer Epidemiology (Statistics)
Dr. R. Sankaranarayanan	—	Assistant Professor of Cancer Epidemiology (Medical)
Sri. S. Muraleedharan Nair	—	Medical Statistician
Sri. R. Raveendran Nair	—	Medical Records Officer
Smt. G. Padmakumari Amma	—	Senior Research Fellow
Smt. P.T. Latha	—	Social Investigator
Smt. Anitha Nayar	—	—do—

Smt. Jalajakumari, V.	— Clerk
Sri. L.G. Amaldas	— Clerk
Sri. Rajasekharan Nair G.	— Clerk
Smt. C. Sreedevikutty	— Typist
Sri K. Shibu Kumar	— Clerk Typist
Sri B. Sreekumar	— Coding Clerk
Smt. D. Chandrika	— Coding Clerk
Smt. S. Ponnammal	— Receptionist
Sri. S. Vijayan Nair	— Sergeant
Sri S. Rajayyan	— Technical Helper

Community Oncology:

Dr. Babu Mathew	— Associate Professor
-----------------	-----------------------

Administrative Office:

Sri. E.U. Aravindakshan	— Administrative Officer
Sri. Joseph Stephen	— Finance and Accounts Officer
Sri. K. Ramakrishnan Potti	— Financial Assistant
Sri C. Somasekharan Nair	— -do-
Sri. K. Parameswaran	— Secretary & Confidential Asst.
Sri. P.K. Viswanatha Menon	— Cashier Cum-Accountant
Smt. C.G. Thankamani	— Confidential Assistant
Smt. Sudevi, R.	— -do-
Smt. Savithri Amma, B.	— -do-
Smt. Ragini Amma	— Clerk-Typist
Sri. Sasikumar, S.V.	— Office Assistant
Sri. N. Ramaswamy Iyer . .	— -do-
Smt. Beena, N.	— -do-
Smt. Lalitha, B.	— -do-
Sri. P. Krishnan Nair	— Driver
Sri. P. Sreekumaran Nair	— Driver
Sri. Antony, P.	— Helper
Sri. Devaraja Panicker	— Helper
Sri. Surendran, G.	— Helper
Sri. M. Subair	— Peon
Sri. R. Sasikumaran Nair	— Watcher

Engineering Wing:

Sri. G. Gopalakrishnan Nair	— Chief Construction Engineer
Sri. R. Raveendranathan Nair	— Project Engineer
Sri. V. Subramonian Potti	— Asst. Project Engineer
Sri. N. Velayudhan	— Asst. Engineer
Sri. P. Rajagopalan	— Asst. Engineer
Sri. R. Asokan Nair	— 1st Grade Overseer
Sri. P. Krishna Pillai	— U.D. Typist
Sri. Jose T. Jose	— Accountant

Early Cancer Detection Centre, Ernakulam:

Dr. B. Syamalakumari	— Cytopathologist
Smt. C. Radha	— Cytotechnologist
Smt. L. Madhavikutty Amma	— Staff Nurse
Sri. K. Sujathan	— Cytotechnician
Smt. T.P. Ramani	— L.D. Typist
Sri. K.N. Viswambaran	— Jr. Laboratory Assistant
Sri. N.A. Abdul Khader	— Hospital Attendant Gr. I.
Smt. N. Santhakumari	— Hospital Attendant Gr. II

Early Cancer Detection Centre, Palghat:

Sri. P.K. Ajayakumar	— Cytotechnician
Sri. Raveendran Pillai	— Cytotechnologist
Smt. Mercy Joseph	— Cytotechnologist
Smt. Lekshmikutty	— Hospital Attendant Gr. II
Sri. P.M. Abdul Rahiman	— Helper

Dr. R. Sudha Gangal, Cancer Research Institute, Tata Memorial Hospital, Bombay.

Dr. D.J. Jussawalla, Tata Memorial Centre, Bombay.

Dr. P.B. Desai, Director, Tata Memorial Centre, Bombay.

Dr. V. Shanta, Director, Cancer Institute, Madras.

Dr. R.D. Ganatra, Head, Radiation Medical Centre, Bombay.

Dr. M. Krishna Bhargava, Director, Kidwai Memorial Institute of Oncology, Bangalore.

Dr. B.D. Gupta, Postgraduate Institute, Chandigarh.

Dr. Sneh Bhargava, All India Institute of Medical Sciences, New Delhi.

Sry. B. Saradamma, Controller of Stationeries, Government of Kerala, Trivandrum.

Mr. B. Trivikraman Pillai, Dy. Director of Census Operations, Kerala.

Mr. N. George John, Director, Bureau of Economics and Statistics, Kerala.

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