POLICY and PRACTICE

Regional Cancer Centre, Trivandrum, Kerala, India; A Green Park for Epidemiological Studies

Cherian Varghese, M Krishnan Nair, Suminori Akiba[1]

Introduction

Kerala a Southern State of the Indian Union has achieved many strides in health care and has an infant mortality of 14 and life expectancy of 72 years for women and 70 years for men. Communicable diseases are largely under control and chronic diseases like cancer, cardiovascular diseases etc are on the increase. The literacy rate is 90% compared to a National average of 50%.[1]

Trivandrum, the capital city of Kerala State has an International Air port and has scenic surroundings including the attractive Kovalam beach and Ponmudi Hill resorts. The backwater trips are an experience of being one with the nature.

Regional Cancer Centre, Trivandrum

The Regional Cancer Centre, Trivandrum (RCC), from its inception in 1981 has focussed on Cancer Epidemiology & Cancer Prevention and this has yielded substantial returns in the last 19 years. The creditable performance of the RCC in these fields has been recognized by the World Body by designating it as a 'WHO Collaborating Centre for Cancer Control in Developing Countries'. It is now well established that 30% of all cancers can be prevented and 30% will require palliative care. Cancer Epidemiology and Cancer Control guidelines are mainly drawn from studies in Western populations and these are not generally applicable to

*Dr Cherian Varghese Associate Professor Cancer Epidemiology & Clinical Research Division *Regional Cancer Centre Trivandrum, Kerala, India 695 011 Fax 91 471 550782 (vengal@hotmail.com) or (cherianv@vsnl.net.in) 1*

Developing Countries like India. The RCC has established a Division of Community Oncology and a Division of Cancer Epidemiology and Clinical research, the first of their kind in India. The RCC in its present set is running a major cancer hospital and organize Epidemiological and prevention related research activities. The RCC has pioneered in many of the Epidemiological and Preventive Oncology fields and has identified methodologies feasible for India and other Developing countries.

With 5% of the total resources for cancer treatment in the World, the Developing countries have to tackle the cancer problem affecting 10 million people by the year 2015. The Western models for cancer control is not applicable in Developing Countries mainly due to the lack of financial resources, human resource and organizational inadequacies. Hence through health service research and change of orientation the developing countries have to control diseases with minimum investment in facilities and human resources and by adopting alternate strategies. It is possible to control cancer through alternate strategies provided there is programme with sound basis on good managerial practices such as in implementation and evaluation. The Regional cancer Centre, Trivandrum has developed a few alternate strategies which has been found to be highly successful. These strategies have helped considerably to 'downstage' cancer in this part of the World. The main requirement for this alternate strategy is health service research, human resource development and appropriate programs.

Ongoing Programmes: Surveillance

a) Hospital Cancer Registry, Trivandrum

Hospital Cancer Registration (HCR) is an integral part of the hospitals cancer programmes and cancer care delivery system. Under the Indian Council of Medical Research, a network of cancer registries in different parts of India was started in 1982. The Hospital Cancer Registry located at Trivandrum has being managed by the Regional Cancer Centre, Trivandrum, since its inception in the year 1982. The registry collects information on cancer patients attending the Medical College Hospital, SAT Hospital and the Regional Cancer Centre, Trivandrum. It records more than 6,000 cancer cases annually and the RCC alone contributes around 80% of cases.

The social investigators of the registry trained in registry operations identify the cancer patients attending RCC and collect personal information, socio-demographic characteristics, tobacco/alcohol habits and reproductive history of female cancer patients. The processing of data is carried out using computers. The Hospital Cancer Registry conducts training programmes in cancer registry system methodologies in collaboration with the University of California, San Francisco, USA.

b) Urban Population Based Cancer Registry

To obtain information on the cancer burden in the community, a Population Based Cancer Registry has been started Trivandrum with aid from International Agency for Research on Cancer, Lyon, since 1994. The residents of the city and of three community development (CD) blocks - Trivandrum rural, Kazhakuttam and Chirayinkil - constitute the base population and the cancer cases registered in the various hospitals are recruited. Along with these, the death records maintained in local administration bodies are scanned for cancer deaths.

The registry covers a total of 10,66,322 population, 50% being in the three CD blocks and 50% in the urban area. The cancer incidence in the population of interest is generated after collecting relevant information on cancer patients from the area by visiting the Medical College Hospital and other hospitals in the geographical area by social investigators of the PBCR, HCR, Trivandrum, contributes more than 80% of the information required for PBCR. The data generated from the registry is used for various cancer control programmes and other research programmes of the RCC.

c) Special purpose registry cancer registry, Karunagappaly.

The Chavara, Neendakara coastal area of Karunagappally taluk in Kollam district has been known as a High Natural Background Radiation area since early fifties and a WHO Committee had recommended in 1957 epidemiologic studies in the area. This was one of the few areas in the world where such high natural radiation occur. Another comparable area with such high radiation was in China. The Chinese study was started in late 70's and there are a number of yield meaningful scientific outcome.

The density of population in Karunagappally taluk was around 2000/sq.km; the Chinese areas had a much less population. The Karunagappally belt had 3 times external Gamma levels than the areas in China.

The Karunagappally study proceeds along three distinct areas. They were identified so as to provide appropriate scientific answers to the social apprehensions and the scientific curiosity that these high natural radiation causes cancer in the population living in Karunagappally.

The study methodology is on the following lines.

a. Complete enumeration of the population
b. Radiation level measurements
c. Cancer registration covering the entire population.

d) District Cancer Database, Ernakulam.

The first District Cancer Control Programme (DCCP) in India was started in Ernakulam District of Kerala State by the RCC. A programme of health education, early detection and palliative care is provided to the people through existing Governmental and Non Governmental Health care systems. All cancer cases detected through this programme are abstracted and entered on to a database. This is expanding into a District Cancer registry and will serve as a model for other DCCP's.

Ongoing Programmes: Epidemiological Studies

a)Population Based Cohort Study

Human Papillomavirus (HPV) is considered as the aetiological agent responsible for carcinoma of the Uterine Cervix. India is one of the high incidence regions for uterine cervical cancer and there has been no population based studies on HPV and cervical neoplasia in India. A cohort study has been set up in a suburban region of Trivandrum city, to study the prevalence of Human Papilloma Virus in genital tract in women and their biologic behaviour. This study has been set up in collaboration with the Institute of Cancer Research in London, UK. A population of 30,000 has been enumerated and every married woman in the community is identified and given an unique identification number. They are invited for clinics held in the field and blood samples and cervical scrape smears were collected in addition to detailed data on socio-demographic and reproductive behaviour. A cohort of 4000 women are being followed up with annual smear collection.

b) Community Based Oral Cancer Screening Programme, Kazhakuttam

The study is supported by the International Agency for Research on Cancer, Lyon, France, and the Association for International Cancer Research, St. Andrews, Scotland, UK.

c) Hospital Based Case Control Study of Occupational Exposure and Cancer

A prospective case-control design was used to identify the occupational groups at high risk of developing lung cancers, lymphomas and leukaemias. All histologically confirmed incident lung cancer, lymphoma and leukaemia cases among men aged 25-65 years registered at the RCC are selected as cases. Controls are selected using a " cancer control " approach. Cancer cases other than lung cancer, lymphomas, leukaemias and those from a few other restricted sites from the control group. A detailed interview of each patient is conducted at the time of registration in the outpatient department to elicit information on life time occupational history and potential confounding variables like age at diagnosis, education, residence, tobacco habits and alcohol consumption. The study is funded by the International Association of Research on Cancer, Lyon.

d) Risk factors for common cancers.

Employing case-control methodology risk factors for cancers of the oral cavity, lungs, larynx and pharynx were studied. The results of these studies have been widely used for cancer control programs in the community. The exposure factors investigated were tobacco and alcohol habits and dietary practices.

e) Survival and End Results Study

Survival from cancer provides the overall effectiveness of cancer care in a region, an effective and summary index of the efficacy of treatment and a sound base for therapeutic planning for cancer patients. Population-based cancer survival estimates are representative of the general pattern of survival from cancer and are necessary while evaluating cancer control measures.

Regional Cancer Centre, Trivandrum, collects follow-up information of all cancer patients from time to time. The active follow-up rate is about 40-50%. To improve the follow-up system, a method adopted is to regularly send reply-paid postcards written in the local language (Malayalam) to the patients who where not followed up (lost to follow up). With this system the follow-up rate was increased to an extent of 80%. Survival rates are estimated using suitable statistical software.

f) Chemoprevention of Cancer

Chemoprevention of cancer is a recent concept in which certain natural compounds or simple chemical substances are given to high risk groups to reduce the occurrence of cancer. There are only few studies on human models. The Regional Cancer Centre, Trivandrum, has been involved in chemoprevention of oral cancer from 1986 onwards. Persons with oral precursor lesions and heavy tobacco habituees were recruited for the study. Vit.A, Beta Carotene and Spiriluna Algae were tried. Intermediate end points like the clinical disappearance of the lesions, reduction in the micro-nuleated epithelial cells and histologic changes were used as indicators of the efficacy of the above substances in patients who had hardly indicated a beneficial effect for high doses of Vit. A and marginal effect for Beta Carotene and Spiriluna algae.

A chemoprevention study with cancer as end point in the high risk group for oral cancer is being planned in which Vit. A and a few other substances will be tried to critically evaluate the chemopreventive potential. The results obtained from the studies have helped us to develop a protocol for treatment of leukoplakias which can be followed in developing countries.

g) Pesticide Residues in Breast Cancer

A collaborative study with the National Cancer Institute, USA to study the role of pesticides especially DDT in breast cancer.

Ongoing Programmes: Preventive Oncology

Models for Health Education and Community Participation:

a) District Cancer Control Programme, Ernakulam
b) Village-level Comprehensive Cancer Control Programme in Kerala
c) Anti-tobacco Programme in Kerala

Potential Areas for Collaboration

The Cancer Epidemiology and Clinical Research Division of the RCC, Trivandrum has been upgraded to the RCC

Institute of Epidemiology, Surveillance and Preventive Oncology. This institute is aimed at promoting collaborative research programmes and human resource training programmes. The following areas are identified for collaborative projects.

Cancer chemoprevention - head and neck cancers, oesophagus
Molecular Epidemiology - Viruses (HPV, EBV) H Pylori and cancer
Basic cancer research - gene environment interactions.
Diet and cancer
Tobacco related morbidity and mortality
Traditional medicinal practices
Clinical Trials
Radiation and cancer
Community based cancer control programmes
Human resource generation in Epidemiology with special emphasis for Asia Pacific region.

References

Biennial report 1988-89 (1990): National cancer registry program of India. Indian Council of Medical Research, New Delhi.

Directorate General of Health Services, Ministry of Health and Family Welfare, Government of India (1984): National Cancer Control Program for India. Directorate General of Health Services. New Delhi. Economic Review (1996): State Planning Board, Trivandrum. Govt of Kerala.

Sankaranarayanan R, Nair M K, Babu M, Remani W, S Mayadevi (1992). Cancer Control Program in India, Opportunities for implementation and evaluation. *Int J Cancer* **50**, 53-56