

A Community - Based Primary Care Approach for Cancer Screening

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Abstract

Background: Cancer is a major disease that affects all sections of the human population. The stage at presentation is the most important determinant of survival in cancer. It was aimed to find out whether primary health care workers could be used for cancer screening effectively.

Materials and Methods: A screening programme was conducted among persons aged ≥ 30 yrs. This screening programme was conducted in three stages. The first stage is done by primary health care workers for cancer symptom screening, the second stage by specialist doctors to confirm symptoms and to collect specimens and next confirmation by cytology. Sixty out of sixty-six primary health care workers and volunteers were selected and trained by faculties in various departments from medical college to administer the tool for cancer screening. The initial survey was conducted by each worker visiting 50 families with a pre-tested semi-structured questionnaire. Those people who found to have cancer symptoms were examined by the specialist doctors at the primary health centres.

Results: In the initial survey, 6801 individuals aged ≥ 30 yrs were studied. Mean age in years was 47.5 (± 13.2) and men constituted 49.9% of the study population. Among the study population, 299(4.4%) showed symptoms suggestive of cancer (4.3% of males and 4.5% of females). Swelling was the most common symptom. Among the symptomatic individuals, 29(9.7%) have already been diagnosed as having cancer and on treatment. The positive predictive value found to be 11.4% for cancer detection but when the precancerous lesions considered the positive predictive value increased to 21.4%.

Conclusion: The cancer detection rate in our study was comparable with the incidence rate in India. Utilization of primary care workers for cancer screening through this model would ensure that the population over 30 years of age would be screened once every 3-5 years without burdening the routine health system.

Keywords: Cancer prevention, Early detection, Health care workers, Kerala.

Key Message: Cancer screening with the help of primary health care workers would enable the health system to identify and cater to needs of the high-risk population at the earliest through primary health care level.

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Introduction

Cancer is a major disease that affects all sections of the human population. Annually there are more than ten million new cases of cancer and more than six million deaths due to cancer which contributes about to 12% of deaths worldwide¹. It is estimated that almost five lakh of people would develop cancer every year in India and in any given year there would be almost 15 lakh cancer patients². The incidence of cancer in India is 70-90 per 100,000¹. Primary care physicians are in a unique position to decrease cancer morbidity and mortality by providing preventive services, including screening and counselling. Recommendations for early detection and

management of cancer through opportunistic clinic-based screening may be inadequate for the rural population in India as access to health facilities is limited and also, the doctor population ratio [1:1800] is also not adequate³. In India, according to cancer registries, the most common cancer among men is that of the oral cavity, lung, stomach, and among the women it is uterine, cervical and breast cancers which can be detected early by simple screening methods^{1,4}.

Despite the fact that Kerala's health indicators are way ahead as compared to other Indian states, due to epidemiological transition lifestyle diseases are on the rise in the state. Every year 35,000 new cases of cancer are detected in Kerala². As in many other areas, the capacity of the health sector has to be scaled up to provide palliative care services for cancers among geriatric population, which is increasing in the state.⁵

The success of screening depends on having sufficient numbers of trained personnel to perform the screening tests with adequate coverage of target population, and on the availability of facilities capable of undertaking subsequent diagnosis, treatment and

follow-up. Targeted cancer should be a common form of cancer which is amenable to treatment but associated with high morbidity and mortality per se, and test procedures should be acceptable, safe and relatively inexpensive. In countries with limited healthcare resources such as India where one primary health centre covers a population of >30,000, the use of trained primary health care workers for the screening of common cancers would help in early detection and treatment. Our study was conducted with the objectives (1) to find out whether locally available primary health care workers and volunteers after training could be used for cancer screening effectively in low-resource rural settings [in India]; and (2) to assess the proportion of patients having any precancerous lesions and common cancers in a rural setting.

Materials and Methods

A screening programme was conducted among persons aged ≥ 30 yrs, in a rural area (Mavoor panchayat) of Kozhikode district in Kerala, during May-Sep 2012.

Sample size: The study participants were subjects aged 30 or older and permanently residing in eight clusters called wards out of eighteen wards. After considering the proportion of death due to cancer (12%)¹ and, considering an allowable error of 5%, the total calculated sample size was found to be 11733. After considering the design effect of 1.2, the calculated sample size was 14080. To cover such a huge sample size we had to cover 2816 houses (Approximate average total family members was taken as 5). To cover 2816 families, eight wards were selected by the simple random method out of eighteen wards of the selected panchayat. All those eligible participants who were willing to participate were included in the study. If the house was locked for the first three visits over one week period, those houses were excluded from the study.

Selection of Volunteers: Accredited Social Health Activist (ASHA) workers and trained health volunteers (eight per ward) were selected from the same locality where the study was conducted. A total of sixty-six primary health care workers and volunteers were selected based on their education status (Minimum Xth Standard) from the community. They were trained by faculties from Community Medicine and Oncology departments from Medical College about precancerous symptoms and to administer the tool for cancer screening. Sixty of them were found to be competent in the initial evaluation and they were given training regarding early signs and symptoms of cancer and a brief overview of the objective and data collection methods of the study was given. The initial survey was conducted for a period of one week by each worker visiting 50 families with a pre-tested semi-structured

proforma designed and validated by the faculty of Department of Community Medicine.

Study Tool: The questionnaire includes information regarding family particulars, tobacco, alcohol usage, the presence of any symptoms suggestive of common pre-cancer lesions and cancers like oral cavity, uterine cervix and breast cancers. Symptoms included were swelling anywhere in the body, non-healing ulcers, white patches, redness and ulcers in the mouth, difficulty in swallowing, bleeding from anal and urethral orifices, abdominal complaints, breast swelling, post coital bleeding, intermenstrual bleeding and postmenopausal bleeding. It also includes recently diagnosed cancer and any death due to cancer in the past ten year recall period in the family.

Data Collection Procedure: The study has been conducted in three stages. (1) Symptom survey by the primary health workers and volunteers by house visits; (2) Clinical examination by doctors; (3) Finally referral and the laboratory confirmation. [Fig. 1 illustrates the data collection procedure]. To ensure the maximum participation of the people, awareness was created among the local self-government (LSG) members and instructions were given to spread the message in the selected wards through the leaders and elected representatives of LSGs during grama sabha.

Since the increased risk of cancers was reported among people of above 30 years, we included only those age group⁶⁻⁹. The list of houses and household members of age above 30 years were prepared in the selected wards. By conducting house visits, households aged ≥ 30 years were enquired about the presence of any symptoms suggestive of cancer and those with symptoms were given a referral card to attend the screening camp conducted at the primary health centre on fixed days. They were clinically examined by specialist doctors from the department of Radiotherapy, Community Medicine, Obstetrics & Gynecology and referred to the tertiary care centre for further cytological evaluation.

The informed written consents were obtained from each head of the families before data collection and informed consent was collected from persons before clinical examination. Approval has been taken from institutional committee after obtaining permission from District Medical Officer (H) to conduct the study and the study protocol was explained to the community leaders and their permission was taken. Data was entered in excel sheet and the frequencies and summary statistics were calculated using SPSS 16.

Results

In the initial survey, 2955 families with a total of 13,210 household members were studied. Among them, 6801 (51.5%) individuals were found to be ≥ 30 yrs of age. There were 3393 (49.9%) males and 3408 (50.1%)

females (Table 1). Mean (standard deviation) age of the study population was 47.53 (13.2) years.

Substance abuse was noted among males only. Total of 843 (24.8%) were found to have tobacco usage, in the form of smoking or pan chewing. Alcohol usage was seen among 500 (14.7%) (Table 1).

There were 75 (2.54%) families which had a history of any family member died due to cancer during the ten year recall period (41 males and 34 females) with the mean age of 58.2 ± 17.5 yrs.

Out of the total study population, 299(4.4%) of study population showed symptoms suggestive of cancer (4.3% of males and 4.5% of females) as shown in Table 2. The majority of the patients showed swelling (40.8%) as the predominant symptom and one-third (31.1%) presented with multiple symptoms (Table 2). Among the symptomatic individuals 29(9.7%) have already been diagnosed as having cancer and on treatment.

Out of the newly detected 270 symptomatic subjects who had given referral card, 257 (95%) came to screening camp and tertiary care centre for further evaluation. Among those, five (1.9%) patients were detected to have cancer by screening test (cytological). Among those detected cases, two were males and three

were females. Among the remaining 252 symptomatic people, 30 (11.9%) people were found to have precancerous lesions. In our study total of 34 cancer patients were there (5 newly detected from screening and 29 cases diagnosed previously). The positive predictive value found to be 11.4% for cytologically confirmed cancer but when the precancerous lesions were considered the positive predictive value increased to 21.4%.

Table 1: Sociodemographic characteristics of study population

Variables	N (%)
Age (in yrs)	
30-44	3284 (48.3)
45-59	2126 (31.3)
≥ 60	1391 (20.4)
Sex	
Male	3393 (49.9)
Female	3408 (50.1)
Substance abuse (Only among males)	
Tobacco	843 (24.8)
Alcohol	500 (14.7)

Table 2: Major symptoms detected among the subjects

Symptoms	Total N (%)	Sex	
		Male N (%)	Female N (%)
Swelling	122 (40.8)	64 (43.8)	58 (37.9)
Constipation	41 (13.7)	19 (13.0)	22 (14.4)
Non-healing ulcers	22 (7.4)	11 (7.5)	11 (7.2)
Multiple symptoms	20 (6.7)	13 (9.0)	7 (4.6)
Others [#]	94 (31.4)	39 (26.7)	55 (35.9)
Total	299 (100.0)	146 (100.0)	153 (100.0)

([#] includes white patches, redness and ulcers in mouth, difficulty in swallowing, bleeding from anal and urethral orifices, breast swelling, post coital bleeding, intermenstrual bleeding and postmenopausal bleeding)

Recruitment and training of primary health workers (ASHAs, JPHN), volunteers
Assessment of the competencies of the health workers and volunteers
Each worker was asked to cover 50 families in their area
Those people with symptoms were referred to Primary health centre by the workers
At the Health centres, the doctors examined all the referred patients and specimens were collected and some patients were referred to tertiary care centre for evaluation
Cytological and Radiological evaluation was done and the results were communicated with patients

Fig 1: Stages of screening programme

Discussion

We conducted a multiphase cancer screening using community volunteers. A good proportion (5 out of 257 symptomatic subjects) of cancer patients were newly detected from the study. The overall incidence rate of cancer in our study was 73.5/1,00,000 which is comparable with the incidence rate in India which is 70-90/1,00,000¹. Overall yield is increased when we add up the precancerous lesions which have malignant potential in the future. As far as to our knowledge, our study is the first community-based approach to cancer screening with the use of trained primary health care workers in the Kerala context. The goal of this study was to examine the utilization of primary health care workers and volunteers in the screening of common cancers. Since due to maximum reach and acceptability, it has been demonstrated in other studies that cancer detection could be improved through a variety of community-based interventions¹⁰⁻¹³.

In the context of primary health care in India, the health staff in primary or secondary care centers are already overburdened with their workload where they can't spend much time for the screening program¹⁴. And also, people from rural areas are not having access to the proper health care due to various reasons like lack of awareness/time to attend the health facilities, inadequate health infrastructure for opportunistic clinic-based screening for cancers at primary health care level³. As suggested by Vernon SW et al.¹⁵ it is important to implement the integrated approach for screening of all the common cancers. This would create awareness among the primary care physicians and it helps in screening for cancer during the routine patient visit. Diagnostic and treatment facilities are now available at affordable prices and, therefore, identification of cancer and initiation of therapy at the earliest would form a vital component of the national programme for non-communicable disease.

In our study patients detected to have cancer were put on treatment in the tertiary care centre and those not having cancer but required treatment (e.g.: Lipoma, inter-menstrual bleeding, Thyroid swelling, piles, etc.) was referred for treatment to the corresponding departments. Study participants detected to have precancerous lesions were given pamphlets containing information regarding signs and symptoms of cancer and precancerous lesions and they were advised to attend follow-up visit at the Medical College Hospital. The patients were advised follow-up for clinical breast examination, pap smear, digital rectal examination, fecal occult blood test, mammography every year, chest X- ray every three years and sigmoidoscopy every 4-5 years according to the guideline given under national programme for cancer control. The prevalence of tobacco usage (24.8%) in our study, slightly lesser than the national prevalence of tobacco use (30.2%) and alcohol usage was found to be higher¹⁶. Those patients

with tobacco and alcohol usage were given counseling/cessation programmes to stop these habits.

This study reveals that 13 (4.8%) of the symptomatic subjects who did not turn up for further evaluation could be traced by the volunteers for follow up. It is hoped that our study would have created awareness about cancer and its risk factors and self-directed cancer screening among the study population. While this study demonstrates a community-based screening program for the detection of cancer, it is vital to study further how those detected to have cancer could be motivated to seek care and comply with therapy. And also, it is important to strengthen the cancer care services in district hospitals to provide primary management that would help in improving the case detection rate at the primary care level.

Study finding shows that prioritizing cancer screening at the primary health care level with trained community volunteers would provide better health care without increasing the workload of health care worker. Screening of cancer only in ≥ 30 yrs. of age might cause the program to miss a few number of paediatric cancers, which are estimated to be less in numbers, amicable to screening. A limitation of this study is that we did not include the younger age group in the screening which can add up accurate incidence rates.

Conclusion

The cancer detection rate in our study was comparable with the incidence rate in India proving the efficiency of screening. Our study provided the benefit for both study participant and the family. So utilization of community volunteers to screen for cancer through the model suggested here would ensure that the population over 30 years of age could be screened once every 3-5 years without burdening the routine health system. It is suggested that this low-cost screening process would enable the health system to identify and cater to needs of the high-risk population at the earliest through primary health care level. This approach by early detection and treatment would help in reduce the burden of palliative care units.

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Conflicts of Interest: None

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