

A Successful Model of Cancer Screening in Low Resource Settings: Findings of an Integrated Cancer Screening Camp from a Rural Setting of North India

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Background: Cancers of cervix, breast and oral cavity claims millions of deaths each year globally and are the three most common cancers in India. There is need to develop and test models for organizing integrated cancer screening camps in low resource settings with inter-sectorial co-ordination between different stakeholders.

Methods: A community based integrated cancer screening camp was organized in a rural setting of north India in co-ordination with district health administration and local governing body (Panchayati Raj Institution). Screening methods included Clinical Breast Examination (CBE) for breast cancer, visual inspection under 5% acetic acid (VIA) for cervical cancer and oral visual examination (OVE) for oral cavity cancer. Men and women found to be screen positive in the camp were referred to the district hospital and a tertiary care center for further diagnostic tests and were followed up.

Results: A total of 90 individuals (40 men and 50 women) above 30 years of age attended the screening camp. Of them, one (2.5%) male was screened positive for precancerous lesion of oral cavity. Out of the 50 women attending the camp, two were detected with suspected breast lumps, which on further diagnostic tests at district hospital were diagnosed as benign tumors. Only half (52.0%) of the women consented for cervical cancer screening, out of which one (3.9%) was screened positive on VIA which on colposcopy examination and biopsy at referral center was confirmed as early stage cancerous lesion of cervix and was instituted on treatment.

Conclusion: The screening camp sets a successful example of community based cancer control activity for early detection and management of three common cancers through inter-sectorial co-ordination in low resource settings.

Introduction

Cancer is one of the leading causes of morbidity and mortality worldwide, with approximately 14 million new cases annually [1]. It is the second leading cause of mortality globally and was responsible for 8.8 million deaths in the year 2015 with 70% of these deaths occurring in low and middle income countries (LMICs) only [2].

Early detection of cancer greatly increases the chances for successful treatment. There are two major components of early detection of cancer: health promotion including education and early diagnosis through screening [3]. World Health Organization recommends early detection through screening of at risk population for common cancers of the breast, cervix, mouth, larynx, colon and rectum, and skin [3]. However, screening programs should be undertaken when prevalence of the disease is high enough to justify the effort and costs of screening and when facilities exist for follow-up of those with abnormal results to confirm diagnoses and ensure treatment [4].

Breast and cervical cancers are the most common cancers in Indian women [5]. However, they are

easily amenable to screening methods. For breast cancer, it is recommended to have Breast Self-Examination (BSE) aided by clinical breast examination [6]. For cancer cervix, visual inspection of cervix under acetic acid (VIA) and Visual Inspection with Lugol's Iodine (VILI) are recommended for any low resource-settings [7]. Similarly, oral cancers can easily be screened by visual inspection of oral cavity even by primary health care workers and trained non-medical personnel [8].

As these three common cancers can be screened in any low resource settings, we organized a cancer screening camp in a rural setting for screening and early detection of these three cancers.

Materials and Methods

An integrated cancer screening camp was organized in village Kheri of Raipur Rani Community Development Block in district Panchkula of Haryana, North India which is the rural field practice area of the department of Community Medicine, PGIMER, Chandigarh. Government Middle School within the village was chosen as the site for the camp. District health administration and local governing body participated actively. The village, where the camp was organized, had a total population of 1680. The village Sarpanch (local elected village leader under Panchayati Raj Institution), other PRI members and the community health workers like ANMs and ASHAs disseminated information about the camp in the adjoining villages, starting one month prior to the camp. The eligible population for screening was chosen as those 30 years or above of either sexes willing to undergo screening and were not diagnosed previously with these cancers. Informed oral consent was taken before screening of the eligible participants.

Health Work Force for Camp

District civil surgeon deputed one Gynecologist and one specialist Dental Surgeon from the nearby Community Health Centre (CHC) and District Hospital. Principal Medical Officer deputed two staff nurses trained in conducting cervical cancer screening. From the department of Community Medicine, PGIMER, one faculty member, one senior resident and two junior residents participated. In addition, school teachers and local village volunteers were actively involved for motivating the villagers to undergo screening.

Set up of the cancer screening site

Screening for the three cancers was performed in three separate different rooms to maintain confidentiality and privacy. Appropriate labels in local language were displayed at the entrance of each room. Participants were explained about the benefit of the screening tests through health talks and only those who consented were screened.

Three teams were formed: 1) For breast cancer education and screening 2) For cervical cancer screening and 3) for oral cancer screening. These teams were given separate rooms in the sequence as depicted in Figure 1.

Figure 1: Set up of the Integrated Cancer Screening Camp at Kheri village of Haryana, North India.

In common area for Health Education, health talk was imparted to the participants about the three common cancers, their risk factors and importance of early detection and management. They were also told about the importance of periodic checkups even if they do not have any signs or symptoms. At the end, participants were instructed to move to appropriate rooms for the screening after taking consent.

In room number 1, the dental surgeon assisted by dental assistant did screening for oral cancer by Oral Visual Examination (OVE) of all the participants. In room 2, the gynecologist assisted by two staff nurses and one female health worker, did screening for cervical cancer by visual inspection of cervix with 5% acetic acid (VIA) technique as per the International Agency for Research on Cancer manual and chart [9]. System was setup such that sterilized speculums always remained available irrespective of the number of women who may report for examination. Time taken to examine each woman and time to disinfect a speculum was taken into consideration to plan the number of speculums required for camp.

In room 3, a team of two female resident doctors showed 10-minute video on Breast Self-Examination, to the participants in batches of about 10. It was then followed by Clinical Breast Examination (CBE) in sitting and lying down position by the resident doctors as per the modified version of the Canadian National Breast Screening Study protocol [10].

Results

A total of 90 individuals (40 men and 50 women) above 30 years of age attended the screening camp. Majority of the participants were in the age group 40-49 years (Table 1).

Variables	Number (%)
Sex	
Male	40(44.4)
Females	50(55.6)
Age group (in years)	
30-39	20(22.2)
40-49	40(44.4)
50-59	21(23.3)
60 and above	09(10.0)
Education	
Illiterate	34(37.8)
Up to primary level (5th class)	28(31.1)
Up to Middle (8th class)	16(17.8)
Up to Matriculation & Above	12(13.3)
Occupation	
Housewife	36(40.0)
Unskilled Labour	22(24.4)
Farming	16(17.7)
Govt. employee	08(8.9)
Unemployed/retired	08(8.9)
Total monthly income (in Indian National Rupees)	
>5000	04(4.4)
5000-10,000	30(33.3)
10,001-15,000	32(35.6)
15,001-20,000	16(17.8)
Above 20,00	08(8.9)

Table 1: Socio-demographic Characteristics of the Camp Participants (N=90).

All the 50 women consented to undergo screening for breast cancer out of which two were found to have suspected breast lump on CBE (Table 2) and were referred to district hospital for confirmatory investigations. Both cases complied with the referrals and based on further investigations, such as Mammography, USG and FNAC, were diagnosed as cases of fibro adenoma,

a benign lesion of breast. Out of the 50 women, only 26 consented to undergo screening for cervical cancer through VIA technique out of which one was screened positive (Table 2) and was finally diagnosed with cervical squamous intraepithelial neoplasia-2 (CIN-2), an early stage cancerous lesion of cervix based on colposcopy examination and biopsy test at PGIMER, Chandigarh and was instituted on treatment from there.

Cancer Screened	Number of individuals Screened	Number(%)screened Positive
Oral	90	1(1.1)
Breast	50	2(4.0)
Cervical	26	1(3.9)

Table 2: Screening Results of the Integrated Cancer Screening Camp in Rural Haryana (N=90).

All the 90 participants consented to undergo screening for oral cavity cancer, out of which one male participant was found to have leukoplakia, a pre-malignant lesion of oral cavity (Table 2). The person was a chronic bidi smoker and habit of chewing tobacco. He was informed about the risk of the lesion to turn malignant and counseled for quitting smoking and tobacco chewing.

Discussion

Increasing community awareness about cancer and screening for common cancers provides the most cost effective approach for prevention and control of cancers and has high public health potential [11]. To move towards Universal Health Care Coverage (UHC) [12], health systems should devise mechanisms to include NCDs including cancer screening and management in the health care package at district and sub-district level.

There are many strengths of our experience. First, using World Cancer Day, all-important sectors were sensitized and involved. All sectors like district and sub-district level health system, PRIs, local education department and department of Community Medicine of a tertiary care institute, as nodal coordinating department, contributed. Thus for achieving UHC, if one needs to add a new service, this model demonstrates - how to use some important public health day like World cancer day, involve the political and health system leaders and demonstrate them the service provision in a limited population. Same service can then be extended to other populations with their support without financial burden on the population- achieving all three dimensions of UHC [11]. This model also demonstrates that inter-sectoral coordination can not only help mobilize the resources but it also increases the stake of possible stakeholders.

Secondly, acceptability of the population for breast cancer and oral cancer screening was high as everyone consented to undergo these giving an acceptance rate of 100%. However, for cervical cancer screening only 52.0% of the women consented. There are other experiences from India where cervical cancer screening rates were reported to be somewhat higher [13][14]. This may be due to different methodology followed in organizing these screening camps. In the study by Mishra et al, Tata memorial hospital, Mumbai had setup a community based cancer screening program with strong component of Health Education Program (HEP). Program had strong house to house survey, followed by HEP, before actual screening was done [12]. In this model, they had used 10th grade qualified workers after providing 3 months training, to screen the population for cancers. Project staff did the screening activity and other sectors were not actively involved. In the study by Sharma et al from Delhi, cervical cancer screening camp was set up at Primary Health Centre level. In these camps, Pap smear as screening test was done among women who clinically were found to have some reproductive morbidity [13]. There are some other examples of organizing camps for breast cancer screening [15][16]. Most of these screening camps were organized at health facilities at district or sub-district level. In this context our experience of organizing an integrated cancer screening camp at village level in community setting at village level by involving specialists and

creating professional setup for examination with inter-sectoral coordination can be considered successful and a unique model.

It may be argued that diagnostic yield in our camp was less. Only one woman (3.99%) out of 26 screened for cervical cancer was found positive on VIA and 2 (4.0%) out of 50 screened for breast cancer had suspicious breast lumps. Reports of other camps available in published literature show that at most places only symptomatic or pre-screened eligible populations were screened further for cancer screening. In a screening camp at Raichur, Karnataka, 7 out of the 22 women having complaints of reproductive tract morbidities undergoing screening, had suspicious malignancy on Pap smear [17]. The study by Sharma et al also reported prevalence of 7.1% carcinoma in situ or high grade carcinoma on Pap smear among women who were clinically having any reproductive morbidity [14]. In the Mumbai study done on large population with extensive health education and targeted screening of women having some pre-eligibility criteria, cancer cervix screen positives were 14.9% [13]. Less diagnostic yield in our camp may be due to the fact that no such prescreening was done and women in all reproductive age groups were invited for examination irrespective of their symptom status. On the spot 20 minutes' health education talk was imparted to highlight the need and significance of periodic examinations and the fact that any woman may have cancer without experiencing any symptoms. With this minimal effort, about 50% of the women got themselves screened for cervical cancer. In Mumbai study, even with extensive efforts, only 70% women came forward for screening [12]. We believe that with additional health educational efforts during the weeks preceding the camp, screening output could have been increased.

In conclusion, our model of community based integrated cancer screening camp for three common cancers sets a successful example of cancer control activity in low resource settings. Two cases of undiagnosed pre-cancerous lesions were detected in the camp which shows its success for early detection of cancers. The current model of organizing integrated cancer screening camp for common cancers may be scaled up for cancer screening and prevention for common cancers in all low resource settings at district, state and country level in low and middle income countries.

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Conflict of interest None declared

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References

References

1. Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C, et al. GLOBOCAN 2012 v1.0, Cancer Incidence and Mortality Worldwide: IARC Cancer Base No. 11. Lyon, France: International Agency for Research on Cancer; 2013.
2. World Health Organization. Cancer Fact sheet. Available from: <http://www.who.int/mediacentre/factsheets/fs297/en/> [last accessed on 16 December, 2018].
3. World Health Organization. Early detection of cancer. Available from: <http://who.int/cancer/detection/en/> .[last accessed on 16 December, 2018].
4. World Health Organization. Cancer. Screening. Available from: [https://www.who.int/cancer/prevention/diagnosis- screening/screening/en/](https://www.who.int/cancer/prevention/diagnosis-screening/screening/en/)[Last accessed on 16 December, 2018].



5. Labani Satyanarayana, Asthana Smita, Chauhan Sonia. Breast and cervical cancer risk in India: An update. *Indian Journal of Public Health*. 2014; 58(1)[DOI](#)
6. World Health Organization. Breast cancer: prevention & control. Available from: <http://who.int/cancer/detection/breastcancer/en/> [last accessed on 16 December, 2018].
7. World Health Organization. Screening for cervical cancer. Available from: http://who.int/cancer/detection/cervical_cancer_screening/en/ [last accessed on 16 December, 2018].
8. World Health Organization (2017e). Screening for oral cancer. Available from: <http://who.int/cancer/detection/oralcancer/en/> [last accessed on 16 December, 2018].
9. Sankaranarayanan R, Wesley R . A Practical Manual on Visual Screening for Cervical Neoplasia. *IARC Technical Publication No. 41*. Lyon, IARC Press. 2003.
10. Basset AA. Physical examination of the breast and breast self-examination; in Miller AB (ed.): Screening of Cancer. *Orlando, Academic Press*. 1985.
11. World Health Organization (2002). National cancer control programmes: policies and managerial guidelines. Geneva, Switzerland: WHO.
12. World Health Organization. Health financing for universal coverage. Available from http://www.who.int/health_financing/universal_coverage_definition/en/ [Last accessed on 16 December, 2018].
13. Mishra GA, Dhivar HD, Gupta SD, Kulkarni SV, Shastri SS. A population-based screening program for early detection of common cancers among women in India - methodology and interim results. *Indian Journal of Cancer*. 2015; 52(1)[DOI](#)
14. Sharma Pragya, Rahi Manju, Lal Panna. A community-based cervical cancer screening program among women of Delhi using camp approach. *Indian Journal of Community Medicine*. 2010; 35(1)[DOI](#)
15. Reddy Neha, Ninan Tilu, Tabar Laszlo, Bevers Therese. The Results of a Breast Cancer Screening Camp at a District Level in Rural India. *Asian Pacific Journal of Cancer Prevention*. 2012; 13(12)[DOI](#)
16. Jose R. Breast Cancer Awareness and Screening: A New Approach. *Academic Medical Journal of India*. 2015 ; 3(4):1-2.
17. Ade A. Cervical cancer screening. *Int J Reprod Contracept*.