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VISUAL INSPECTION AND ORAL SPOT PLATES (OSPS) AS A SCREENING AND A SURVEILLANCE TOOL FOR THE PREVENTION OF ORAL CANCER IN RURAL AREAS AND IN A TERTIARY CARE HOSPITAL IN HARYANA

Community Medicine

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ABSTRACT

The GLOBOCAN Cancer project 2012 predicted that the incidence of cancer in India is likely to double in the next two decades and reach approximately 1.7 million new cases by 2035 3 . In Delhi, as per the GATS 2 report, the usage was (17.8%) and in Haryana (23.6%). 2 This has not changed much as the GATS-2010 report showed that more than one-third (35%) of adults in India used tobacco in one form or the other. Further, most of these new cancers are related to tobacco use in rural areas and surveillance activities in these areas are poorly organized to pre-empt the early diagnosis these oral cancers.

Owing to the high prevalence of Oral Cancer in Haryana and lack of screening, we organized opportunistic screening and visual screening for smokers and smokeless tobacco patients (SLT) (using gutka, pan, khaini with tobacco) in two rural areas of Haryana namely Panipat and Jhajjar, in Haryana. This study was aimed to carry out opportunistic screening of tobacco users in two tertiary care hospitals in the Department of TB and Chest and Department of Dentistry. Deaddiction and follow-up with e-mobile technology was carried out in the Department of TB and Chest, in Panipat, Haryana, India.

Based on the patterns of lesions observed during visual inspection of these patients, oral spot plates (OSPs) were developed which were subsequently used to induce a behavior change in these patients. Patients who showed a positive behavior change were referred to the deaddiction OPD of the Department of TB and Chest.

The study methodology adopted in this research model is longitudinal where patients having suspected lesions would be followed up with deaddiction medications and monitored with e-mobile technology. The study would also analyze the potential role of opportunistic screening and proactive screening in the prevention of smokers and smokeless tobacco (SLT) related cancer.

KEYWORDS

Smokers and Smokeless tobacco (SLT), OSPs (Oral spot plates), Surveillance

Introduction: Current Scenario of Tobacco use in India and Haryana

The incidence of cancer globally is estimated to be 14 million cases in 2012 and 8 million deaths. The age adjusted incidence world average for cancer is 164 cases per 100,000 population; for India, this incidence is about 94 per 10,000 population. [1] The GATS 2 report (2016-2017) (Global Tobacco Adult Survey: Second round) showed that 28.6% of Indians were using tobacco products. [2] The highest prevalence of tobacco use was seen in the North-Eastern states such as Tripura (64.5%), Mizoram (58.7%), Manipur (55.1%) and the least prevalence of tobacco use was seen in Goa (9.7%), Puducherry (11.2%), Kerala (12.7%) and in Punjab (13.4%). In Delhi, as per the GATS 2 report, the usage was (17.8%) and in Haryana (23.6%). [2] This has not changed much as per the GATS-2010 report which showed that more than one-third (35%) of adults in India used tobacco in one form or the other. This high figure compounded by the fact that 21% adults used smokeless tobacco, 9% only smoking tobacco and 5% used smoking tobacco as well as smokeless tobacco; necessitates swift action especially screening with deaddiction at all India level and more so in Haryana.

The GLOBOCAN Cancer project 2012 has predicted the has the incidence of cancer in India is likely to double in the next two decades and reach approximately 1.7 million new cases by 2035. [3] Most of these new cancers are related to tobacco use in rural areas and surveillance activities in these areas are poorly organized to pre-empt the early diagnosis these oral cancers. The projection for India regarding cancer is not good for the future. It is estimated that the prevailing incidence of 1.45 million cases (2016) would rise and reach 1.75 to about million cases (2020). It is thus imperative keeping in view with the limited healthcare cancer facilities India especially in rural areas, the only effective way to tackle this rising burden of Cancer in India lies is its prevention and surveillance [4].

As Dr Poonam Khetarpal Singh, Regional Director WHO (South-East Asia Region) has underlined that there are four modifiable risk behaviours in South East Asia which can bring down the prevalence of NCDs, the most important being tobacco use, unhealthy diet, insufficient physical activity and harmful use of alcohol. [4] Further, she said that there are certain steps are available which can overall decrease the prevalence of NCDs. (WHO STEPwise approach to NCDs) [5] ; there are about 246 million smokers and over 290 million smokeless tobacco users in South East Asia.

Screening for oral cancer

Screening strategies in rural settings often gets complicated because of lack of locally trained manpower, inaccessibility of roads and non-cooperation and poor health seeking behavior of the community who use tobacco products to start with. This brings up a question of how to rapidly screen the entire community and carry our deaddiction with behavior modification and eventually prevent and bring down the prevalence of cancer. It is very important and crucial to bring about and

sustain a behavior change so as to maintain a healthy lifestyle and quit tobacco use. Many studies have shown that Oral Screening Tool for Oral Cancer to detect Pre-malignancies because of tobacco use have high specificity if used in high risk groups can rapidly decrease tobacco use [6]

In one of such studies carried out by the Department of Oral Medicine and Radiology, Dental College, Thiruvananthapuram in Kerala, an oral Screening Tool for Oral Pre-malignancies (STOP) was developed and used by junior house surgeons on 255 patients. The STOP tool was had a sensitivity of 96.6% with a specificity of 99.0% and was able to detect 59 positive patients with and accuracy of 98.4% and a reliability coefficient 0.874.

Screening is vital as a secondary prevention step to control a disease and is described 'as a set of measures for the early detection and prompt intervention to control disease and minimize disability thus gaining in lead time and improve the overall management of a disease' [7] . Thus, the main objective of screening is to detect a disease early, with the primary intention to halt its progression of a disease and institute evidence based therapeutic interventions so as to cure the disease. Screening requires a proactive approach to detect a disease early even before a patient is aware of the disease.

Screening is justified when early intervention is more successful and cost-effective than passively waiting until symptoms appear and then just treating the condition. Examples of screening tests include mammography for breast cancer, pre-natal amniocentesis for detecting congenital malformations, or psychological tests to identify early signs of cognitive decline. Screening for cancer is an effective intervention which has been underutilized in many countries of the world. Early detection of a pre-malignant lesion of cancer by screening has the potential to gain lead time in diagnosis and improve the quality of life of a patient using tobacco.

Types of screening

1. Opportunistic screening or case-finding

This form of screening restricted to patients who consult a health practitioner for some other purpose (the GP may take your blood pressure when you come for your 'flu shot'). The doctor takes the opportunity to detect any obvious disease in the body.

2. Invitational (population-based) screening

In this type of screening invitations are sent to the high-risk population and general practitioners doctors. [8] The disadvantage of this type of screening that many respondents do not attend the clinic at the specified time. This screening technique involves the use of proactive or systematic screening: population registers are used to invite members of the population at risk for screening at appropriate intervals

3. Targeted 'high-risk group' screening

This type of screening is carried out in high risk groups likely to develop some kind of disability or disease such as in groups with specific exposures is often used in environmental and occupational health (e.g., battery workers)

4. Mass screening involves screening a large population

This type of screening is done at the level of a population such as compulsory dental check ups or testing for phenylketonuria in neonates [9]

5. Multiple or multiphasic screening

In this type of screening more than one test are done to detect more than one disease, such as an annual health check-up [9][10] Pre -employment or medical checkups before joining service or military are examples of multiphasic screening

Screening strategies for oral pre-cancer detection and its cost effectiveness

Screening strategies for oral precancer detection are cost effective especially when screening it is carried out directly by dentists, as it offers the best screening accuracy as the target population are directly seen by dentists.[11] Oral Cancer is the 6th most common cancer in Thailand and has an incidence rate of 188 per 100,000 population. In this study, which was conducted in Thailand, a screening program for cancer was analyzed to see whether it is a cost effective measure or not. This study used a simulated Markov model using cost utility analysis and compared a precancer screening program to a no screening program in adults, who were 40 years or above. Results were expressed in (QALYs) and Incremental Cost-Effectiveness Ratios (ICERs). The result of this study showed that, continuance of a screening program yielded costs of (1,362 Baht) and QALYs (0.0044 years) than with no screening program and producing an Incremental Cost-Effectiveness Ratios (ICER) of 311,030 Baht per QALY gained.

This study clearly showed that screening for oral precancer detection is cost effective. This study also compared the cost effectiveness between various modalities of screening such as mouth self-examination (MSE); visual examination by trained dental nurses (VETDN) and visual examination by oral surgeons (VEOS) and found that when MSE, VETDT, and VEOS were all done together then the study was most feasible and effective; and more so in Thailand with only 4,647 active dentists at public hospital to conduct screening for oral cancer.

Rationale

As stated above the GLOBOCAN Cancer project 2012 has predicted the has the incidence of cancer in India is likely to double in the next two decades and reach approximately 1.7 million new cases by 2035 [3] Further, as per the GATS-2 report the tobacco use usage in Haryana (23.6%). Most of these new oral cancers in Haryana are related to tobacco use in rural areas and surveillance activities are poorly organized to pre-empt the early diagnosis these oral cancers. Visual inspection and oral spot plates are screening methods which can effectively be used and rapidly detect these cancers.

AIMS AND OBJECTIVES :-

First phase of this study

1. To study the pattern of oral cancer of patients reporting to the Dental OPD of the Hospital by visual inspection
2. To develop oral spot plates (OSPs) based on the oral examination of the screened patients

Methodology

This prevention and therapeutic study on oral cancer study has been designed in four stages where the first stage would be to develop the Oral Spot plates (OSPs) from the visual inspection of patients using smoking and smokeless tobacco (SLT) carried out in the department of dentistry of at NCMH and WCMSRH. (for any evidence of cancer such as leukoplakia, or any carcinoma *in situ* or any symptoms/signs of cancer).

In the second stage, any behavioral change would be observed when patients (using smoking smokeless tobacco (SLT)) would be shown the OSPs (Oral Spot plates); further an FGDs would be carried out at this stage and spread sheet analysis would be prepared to identify positive key motivating factors for abstaining from smoking and barriers to continue using tobacco.

In the third phase, the identified patients showing a positive behavior change and showing eagerness to quit would be examined at the de-addiction centre at the Department of TB and Chest and medication for deaddiction given and records would be maintained for each patient In the final fourth phase to sustain deaddiction; a follow-up methodology would be used via mobile phones and monitoring of the patients by e-mobile networking would be done.

Statistical tests used

Since this is an exploratory study the initial procedure was carried on by visual inspection. Patients showing a behavior change were surveyed by focused group discussions and factors were identified by spread sheet analysis. Further barriers for not seeking deaddiction would be identified.

OBSERVATIONS AND RESULTS

Visual screening was done randomly in the Department of Dentistry in about 200 patients in the Department of Dentistry at World College of Medical Sciences and Research and Hospital, Jhajjar, Haryana (WCMSRH). Photographs were taken and these oral spot plates developed which are shown below.

ORAL SPOT PLATES (OSPs) PREPARED FROM PATIENTS HAVING A SMOKING HISTORY

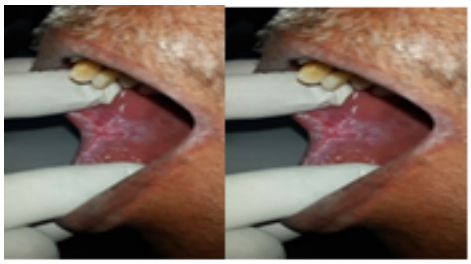

Fig. 1 & 2 showing mixed red and white patch at the retro-commissural area on right side

Fig. 3 showing grayish white patch at retro-commissural area on left side.

Fig. 4: showing grayish white patch giving crack mud appearance on left side extending from retro-commissural area to mandibular first molar on buccal mucosa.

Fig. 5: showing grayish white patch at right retro-commissural area.

Fig. 6 showing mixed red and white patch on left retro-commissural area

DISCUSSION

The early signs of oral cancer could be leukoplakia or erythroplakia. The World Health Organization (1997) described leukoplakia as "a predominantly white lesion of the oral mucosa that cannot be categorized as any other definable lesion."[12] The term leukoplakia should be used to recognize white plaques of debatable risk having excluded other known diseases or disorders that carry no increased risk for malignancy. [12]WHO finally defined this lesion as "a white plaque with a growing debatable oral cancer risk after excluding other known diseases and disorders that do not increase the risk." Lesions such as Oral leukoplakia (which could be pre-leukoplakia, Homogeneous or Non-Homogeneous, Proliferative or Verrucous), oral lichen planus could be used to detect oral cancer early and subsequently deaddiction started.

Prevention of cancer

1. Use of oral spot plates in the prevention of cancer

In a study conducted in USA between the comparing the mortality RATES between black and white Americans, several key factors emerged as possible key factors in the pathogenesis of cancer. [14] . There were certain key barriers which predispose a patient for cancer. Oral spot plates are an effective mode which can be very useful to screen patients using tobacco. [11]

2. IEC and community awareness regarding oral cancer

The projection for India regarding cancer is not good for the future. It is estimated that the prevailing incidence of 1.45 million cases (2016) would rise and reach 1.75 million cases (2020).[3] It is thus imperative with the limited healthcare cancer facilities in rural areas, the only effective way to tackle this rising burden pf Cancer in India is its prevention [4] This requires strengthening of strengthening of District Cancer Control Program. The level of awareness regarding the hazards of using tobacco is often poor in rural communities and is critical in the prevention of cancer. In a study, which was conducted in West Bengal, Kerala, Madhya Pradesh, Rajasthan and Mizoram comprising of 3070 households, the knowledge of cancer other than oral cancer was found to be low (prostate 8%, colon 11%).[13] This was associated with a poor awareness of symptomatology of cancer. Further, 'nukkad nataks' may be used to improve awareness among rural community for cancer prevention as it has been done at NC Medical College and Hospital, for the prevention of cancer, NCDs and diarrhea. The response to this activity has been over whelming and is regularly done at the Hospital and sub-center based at Israna, panipat, Haryana

3. Salivary Gland Biomarkers

Most oral cancers are squamous cell Carcinomas. Various biomarkers can provide additional data regarding these cancers microbiologically such as S100A8 which has been shown to rise further as the staging of oral cancer increasing and virtually seen in 92.9% (stage 3) and 100% (stage 4) oral cancers. What is important is that even in stage 1 it is seen to be increased in 3.4% of patients providing an ELISA based test for community screening.[15] Galectine-7, resistin and thrombospondin-2 have all shown to have the potential of being a salivary bio-marker but it remains to be seen that how effective they are with regards to community screening and surveillance whether they can be useful to screen patients in early stage of oral squamous cell carcinoma .[16]

CONCLUSIONS AND RECOMMENDATIONS

The use of visual screening and oral spot plates is a method use to do a rapid survey of suspected cancer patients in a rural area and in a tertiary care hospital. In this study, we found visual screening and OSPs were used to detect and carry out a behavioural change in suspected patients of cancer. Secondly, behavioural change strategy in cancer patients which is the next part of this study, would evaluate the ability of these oral spot plates (OSPs) to induce a cessation of tobacco use and subsequently how effective is the use of pharmacological interventions such as Nicotine gum (which is available over the counter); Nicotine patch, Nicotine inhalers, Bupropion and Varenicline in cessation of tobacco use or smoking.

To conclude, the existing health infrastructure and capacities of India are inadequate to meet the current epidemic of tobacco use in India. Rapidly screening of cancer patients should be carried out extensively at a grass root level in rural areas especially with visual screening and OSPs and suspected patients advised to seek treatment immediately in a tertiary care hospital. A proactive and an active approach should be undertaken such as house to house survey similar to what was undertaken to eliminate poliomyelitis in India rather than a passive approach. This approach might need a more extensive networking and financing but it is possible with community participation and would pay rich dividends in the control of cancer in India especially of oral cancer.

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