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Development of Indian Oral Cancer Risk Score and Index

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ABSTRACT

An Indian oral cancer risk score can help in many aspects to detect this disease earlier and preventing it's progression from various dimensions in a large scale. Keeping in view the unavailability of any oral cancer risk score and index in Indian populations, in the present study a scoring technique was developed for the same. The index was developed from the data obtained from 354 patients attending to the Kusum Devi SunderlalDugar Jain Dental College & Hospital, Kolkata, and Bharatsevashram Hospital.The index was prepared with a series of questionnaire to the patients, and taking proper personal,family, medical, dental, drug andhabit history, and also performing clinical examinations. The risk factors were also interpreted in details. Depending on these data the Indian oral cancer risk score was calculated (total maximum risk score is 42 as per index formula), and then this risk score was validated by judging on 296 patients. The risk was further graded into 3 categories: (a) individuals with low risk, (b) individuals with moderate risk, (c) individuals with high risk. Result revealed that if the total score of a patient is 0-14 then patient is having low risk of developing oral squamous cell carcinoma (OSCC). Similarly, if the score is between 15-28 then the risk is moderate and if the total score came between 29-42 then the patient is under high risk of developing oral malignancy.This scoring and indexing will be helpful to segregate a large population into three categories and that in turn will help to prevent this deadly disease. This Indian oral cancer risk score and index is important for individual and community screening by asking set of questions and a simple routine clinical examination.The

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patient's proforma will be helpful in recording the data required for calculation of the score and interpret it accordingly.

Keywords: Oral cancer, scoring technique, index, risk factors.

INTRODUCTION

Cancer of the oral cavity (Oral cancer) is the 11th most common malignancy in the world (GhantousandElnaaj, 2017). In the global scenario,the incidence of oral cancer is 1-10 cases per 1,00,000 of population.Though oral cancer is one of the most preventable malignancy, it is the sixth most common cause of cancer related death (Borse et al., 2020).Unfortunately,India is the country where the incidence of oral cancer is highest.Oral cancer poses a serious health challenge to the nations undergoing economic transition (Gupta et al., 2017). Oral squamous cell carcinoma (OSCC) contributes remarkably i.e. 84-97% to oral cancer (Borse et al., 2020).The increasing cases of oral cancer are the most important concern for community health as it is one of the common types of cancers in India (Sharma et al., 2018).

In India, around 77,000 new cases and 52,000 deaths are reported annually, which is approximately one-fourth of global incidences (Laprise et al., 2016).In India, 12% of all cancers in men and 8% of all cancers in women accounts to oral cancer.In Indiamost of them are associated with habits of tobacco smoking or chewing. The reason for having so high mortality and morbidity rate is mainlyattributed to late presentation to clinicianin late advanced stages(stage III or IVA or IVB) where already either distant metastases had taken place or tumor size is so huge.

Oral cancer is a comparatively preventable disease among the other malignancies, if we can take proper preventive measures because most of the risk factors are modifiable. An Indian oral cancer risk score can help in many aspects to detect this disease earlier and preventing it's progression from various dimensions in a large scale. Thus, Indian oral cancer risk score andindex is required to standardize and implemented in regular practice for screening of huge number of patients. Keeping in view the unavailability of any oral cancer risk score and index in Indian populations, in the present study a scoring technique was developed for the same.

METHOD

The index was developed from the data obtained from 354 patients attending to the Kusum Devi SunderlalDugar Jain Dental College & Hospital, Kolkata, and Bharatsevashram Hospital.The index was prepared with a series of questionnaire to the patients, and taking proper personal,family, medical, dental, drug andhabit history, and also performing clinical examinations.

The risk factors were also interpreted in details. Depending on these data, the Indian oral cancer risk score was calculated, and then this risk score was validated by judging on 296 patients.

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1. Development of Indian oral cancer risk score:

The scoring technique was developed using the parameters given in the Table 1 and the scores, respectively.

2. Development of Indian oral cancer index:

The risk was further graded into three categories by dividing the total maximum risk score into three (Table 2). The categories are: (a) individuals with low risk, (b) individuals with moderate risk, (c) individuals with high risk.

RESULT

Totalmaximum risk score is 42 as per index formula (Table 1). Result revealed that if the total score of a patient is 0-14 then patient is having LOW risk of developing oral squamous cell carcinoma (OSCC). Similarly, if the score is between 15-28 then the risk is MODERATE, and if the total score came between 29-42 then the patient is under HIGH risk of developing oral malignancy (Table 2).

The three categories are as follows:

1. *Individuals with low risk:*

Individuals having the score between 0-14 can be categorized into low risk group and these individuals should be counselled accordingly, so that if they are having any deleterious habitsthey can get rid of it. If any suspicious family history is there then they should also been aware the fact that they can also develop the same thing if they don't follow some basic oral hygiene procedures and the Dos & Don'ts.

2. *Individuals with moderate risk:*

Individuals with the total score 15-28 should be more seriously counselled as same as previously discussed in the above group.As well as if they have any suspicious lesions in their oral cavity, which are persistent for more than 2 weeks then Exfoliative Cytology,Biopsy,Histopathological examinations should be done and patient should be kept under long term follow-up.

3. *Individuals with high risk:*

Individuals with the score 29-42, are at very high risk of developing malignancies, so they should also be counseled in a way that they can avoid all the modifiable risk factors. For the cancer confirmed cases histo-pathological examination should be done in very early stage, and they should go through proper required treatment under the supervision of specialists.

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TABLE 1: INDIAN ORAL CANCER RISK SCORE

ORAL DELETERIOUS HABITS	SCORE	ORAL DELETERIOUS HABITS	SCORE
Tobacco Smoker:		*Precancerouslesions:*	
Nonuser	0	*OralLichenPlanus*	1
User:		*Erythroplakia/Leukoplakia*	2
Duration:		*OSMF*	2
<5years	1	*Any non-healed ulcers(more than2months)*	2
5-10years	2	*Family history:*	
>10years	3	*Maternal:*	
Frequency		*Mother*	1
<3	1	*Grandparents*	1
3-6	2	*Other blood relatives*	1
>6	3	*Paternal:*	
Smokeless tobacco:		*Father*	1
Nonuser	0	*Grandparents*	1
User:		*Otherbloodrelatives*	1
Duration:		*Infectionorimmunosuppression:*	
<5years	1	*HPVinfection*	1
5-10years	2	*HIVinfection*	1
>10years	3	*CMVinfection*	1
Frequency		*EBVinfection*	1
<2	1	*Syphilis*	1
2-4	2	*Diabetes*	1
>4	3	*Onsteroidtherapy*	1
Betel quid/Paanmasala:		*Candidiasis*	1
Nonuser	0	*Chronicirritation:*	
User:		*Ulcers*	1
Frequency:		*Dentureirritation*	1
<2	1	*Rootstumps*	1
>2	2	*Historyofcancer:*	
Betel nut:		*No*	0
Non-consumer	0	*Yes*	2
Consumer	1	*UVRadiationexposure:*	
Alcohol:		*Occasional*	0
Non-consumer	0	*Regular*	1
Occasional	1	*Chemicalindustry:*	

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Regular	2	*Non-exposed*	0
With other habits	3	*Exposed*	1
Malnourished:			
Yes	1	**TOTAL SCORE**	
No	0		

TABLE 2: DEVELOPMENT OF INDIAN ORAL CANCER INDEX

Total oral cancer risk score range (calculated)	Grading of oral cancer risk
29-42	HIGH RISK
15-28	MODERATE RISK
0-14	LOW RISK

DISCUSSION

In India every year half a million cases of cancer are reported,out of which one-third portion *i.e.* 5 lakhs cases are the cases of diagnosed oral cancer. As compared to the west, the concern of oral cancer is significantly higher in India as about 70% of the cases are reported in the advanced stages (American Joint Committee on Cancer, Stage III-IV). But, it is one of the most preventable malignancies if detected in early stage. By proper preventive measures,the risk factors can be modifiable. There are the some complications due to which the prognosis becomes poor.

Because of detection in the late phase, the chances of cure are very low, almost negative; leaving five-year survival rates around 20% only (Veluthattil et al., 2019).The diagnosis of cancer in the early stage is a key factor to check further physical, psychological, and financial losses to the patient. Upon early diagnosis, timely and proper treatment can be initiated that may improve the survival rate up to 90% (Borse et al., 2020).

Various conventional clinical techniques such as physical and histopathological examination, staining, biopsy, spectroscopic and radiological techniques, etc. are used routinely to detect oral cancer (Borse et al., 2020). Tobacco consumption including smokeless tobacco, betel-quid chewing, excessive alcohol consumption, unhygienic oral condition, and sustained viral infections that include the human papillomavirus are some of the risk aspects for the incidence of oral cancer. Lack of knowledge, variations in exposure to the environment, and behavioral risk factors indicate a wide variation in the global incidence and increases the mortality rate (Borse et al., 2020).

Oral cavity is the part of our body that is well accessible for examination.If any deleterious change is observed then it can be well diagnosed and detected, but patients should come to the clinician in early stage. It is the most suitable key to success of diminishing the number of cases and treating oral cancer. So, early detection and withdrawal of the detrimental habits are the key factors, and for that patient's awarenessis utmost important.

This Indian oral cancer risk score and index is important for individual and community screening.This can be easily calculated for individual and community screening by asking a set of questions and a simple routine clinical examination. This scoring and indexing will be helpful to segregate a large population into three categories and that in turn will help to prevent this deadly disease. The patient's proforma will be helpful in recording the data required for calculation of the score and interpret it accordingly by following the above proposed index.

So,it can be easily concluded from the above discussion that this attempt of developing an Indian oral cancer risk score will help in many aspects to detect this debilitating disease earlier and preventing it's progression from various dimensions in a large scale.

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