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**Conflicts of Interest:** Nil

## Abstract

**Context**: Diagnostic delay in patients of Oral Squamous Cell Carcinoma (OSCC) causes poor treatment prognosis.

**Objectives:** To determine the reasons for delay in diagnosis of patients with OSCC.

**Materials and Methods:** Clinical records of 118 patients attending the Oral Pathology department of Dr R Ahmed Dental College & Hospital were noted. Relevant data was collected in a printed questionnaire form and statistically analyzed. Initial Delay (ID), regarded as the time taken for the patient to seek medical attention and Referral Delay (RD), the time attributed to seek definitive treatment after being referred following initial consultation were considered as the two principal delay periods. Social variables such as age, sex, distance

from medical facility, education, religion etc. were explored. The reasons of delay were recorded and listed accordingly.

**Results:** The overall study showed that there is more diagnostic delay in male patients, patients of Muslim community and in illiterates. People residing in suburbs also reported delay in seeking medical care. Misdiagnosis by initial care giver and financial constraints emerged the leading cause of delay in diagnosis of oral cancer.

**Conclusion:** This study points towards an urgent need of improving the primary physician's diagnostic ability of oral cancer and improving access towards definitive treatment for poor patients.

**Keywords:** Delay in diagnosis, Oral Squamous Cell Carcinoma, Initial Delay, Referral Delay

#### Introduction

India has one of the highest incidences of oral cancer which ranks among the top three types of cancer in the country<sup>1</sup>. Age-adjusted rates are as high as 20 per 100,000 population accounting for almost 30% of all cancers in India<sup>2</sup>. Early diagnosis of oral cancer is the most effective way of combating the disease and avoiding debilitating treatment outcome. Unfortunately, patients often report for treatment at advanced stage which makes prognosis worse. Presentation at late stage also significantly increases treatment cost. West Bengal is the fourth most populous state in India having a very high incidence of oral cancer. This is due to the rampant habit of smoking tobacco and other deleterious oral habits such as paan or gutkha chewing<sup>3</sup>. Public health studies have identified strong correlation between advanced stage of cancer and mortality rate. The social and demographic characteristics of this state are diverse thus prompting us to investigate the reasons for late presentation of oral cancer. It is well documented that specific risk factors and regional variations have a profound impact on this disease and diagnostic delay consists of either patient delay or professional delay <sup>4,5</sup>.

This study was designed to examine the various factors that contributed to the total delay from appearance of initial symptoms to reporting at the tertiary care centre for seeking treatment. We expect that data from our study will highlight deficit in rendering effective treatment at the initial stages of oral cancer and formulating guidelines and policies for effective control of the disease.

#### Materials and methods

#### Study design and duration

The study was hospital based and done on patients who reported to the Department of Oral Pathology of Dr R

Ahmed Dental College Hospital located in Kolkata which is the capital of state of West Bengal.

## **Study population**

Newly diagnosed patients of OSCC [International Classification of Diseases for Oncology (ICD 141,143–145)] with no history of previous head & neck malignancies were selected for inclusion in this study. Only patients residing in the state of West Bengal were included. Patients who had difficulties in recalling events properly or had cognitive deficits were excluded.

## Sample size and sampling technique

The present study group comprised of 118 patients. Demographic details such as age, sex, residence, religion, educational qualification, etc. were obtained. The patient's history was reviewed and previous medical records were examined. The patient and the accompanying persons were interviewed regarding the history of present illness and responses were recorded in the printed questionnaire. OSCC was confirmed in all patients by incisional biopsy and subsequent histopathological evaluation.

## Study methods

The total delay in diagnosis was divided into two phases. Phase 1 or the Initial Delay (ID) was regarded as the time taken by the subject to reach the first consultant to seek treatment for the first time.

Phase 2 or the Referral Delay (RD) was time taken by the subject to report to the referral centre or the hospital after the initial consultation.

All the patients were interrogated to indicate the most appropriate applicable reasons for delay for both the phases from a list of possible causes. The time intervals in ID and RD were recorded in days. The entire state of West Bengal was divided into three zones namely Kolkata proper, suburbs (serviced by suburban railway) and districts (beyond suburbs) for recording the area of

patient's residence. Literacy levels was designated as either illiterate (a person who cannot sign his name), below matriculate (can write but has not passed matriculation or class tenth exam) and third category receiving education above matriculation. The patients were divided in four age groups of below 40 years (6.8%), 41-50 years (28%), 51-60 years (36.4%) and above 60 years (28.8%).

#### Ethics

Informed and written consent, wherever possible was taken and the study was approved by institutional ethical committee.

## Results

The statistical analysis was done using SPSS 20 (statistical package for social sciences) program. Chi square test was done and degree of freedom was calculated. P value of below 0.05 was considered significant at 95% confidence interval. It was noted that each patient had multiple reasons for ID and RD. The average ID and RD were found to be 50 and 45 days respectively. The patients were predominantly male (72%), 50% were illiterate and majority of them (55.1%) residing in the districts. 89 patients were Hindu (75.4%) and 28(23.7%) were of Muslim community (Table 1). ID was present in 85.6% cases (Table 2) and RD in 82.2% cases (Table 3). The leading causes of ID were "hope of spontaneous healing" (46.5%)followed by "Asymptomatic lesion" (27.7%) and "financial causes" accounting for 18.8% cases. The three most important causes for RD were "misdiagnosis by primary consultant" in 54.6% cases, "financial causes" (27.8%) and "alternative forms of treatment" (13.4%). "Transport and distance" was also cited as a reason for RD in 14.4% cases. "Non healing lesion" and "pain" were the reasons for seeking treatment in 61.9% and 61% cases respectively (Figure 1).



GENDER	Frequency	Percentage	
Male	85	72.0	
Female	33	28.0	
EDUCATIONAL STATUS	Frequency	Percentage	
Illiterate	59	50.0	
Below Matriculate	42	35.6	
Above Matriculation	17	14.4	
RESIDENCE	Frequency	Percentage	
Kolkata	19	16.1	
Suburbs	34	28.8 55.1	
Districts	65		
RELIGION	Frequency	Percentage	
Hindu	89	75.4	
Muslim	28	23.7	
Others	1	.8	
AGE GROUPS	Frequency	Percentage	
<=40 years	8	6.8	
41-50 years	33	28.0	
51-60 years	43	36.4	
>=61	34	28.8	
TOTAL	118	100.0	

Table 1: Socio demographic profile of study population

Table 2: Showing reasons for Initial Delay (ID)

Cause	Frequency	Percentage	
Asymptomatic /unaware	28	27.7	
Hope of spontaneous healing	47	46.5	
Fear of diagnosis	5	5.0	
Transport & distance	4	4.0	
Financial causes	19	18.8	
Lack of accompanying	5	5.0	

11	10.9
11	10.9
13	12.9
8	7.9
11	10.9
4	4.0
1	1.0
	11 13 8 11 4 1

Table 3: Showing reasons	s for Referral	Delay (RD)
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Causes	Frequency	Percentage
Asymptomatic /unaware	3	3.1
Hope of spontaneous healing	13	13.4
Fear of diagnosis	2	2.1
Transport & distance	14	14.4
Financial causes	27	27.8
Lack of accompanying person	14	14.4
Alternative forms of treatment	13	13.4
Unqualified opinion	4	4.1
No reason	6	6.2
Misdiagnosis by primary consultant	53	54.6
Family function	8	8.2

Table 4: Cross tabulation for comparison

Multiple consultations	9	9.3
Harvest time	5	5.2
Other disease treatment	2	2.1
Self-treatment	4	4.1
Lack of faith in treatment	1	1.0

Cross tabulation (Table 4) was done among results to gain further insight into reasons for ID and RD. ID was almost equal in both sexes; 84.7% among males and 87.9% in females respectively. According to educational qualification ID in illiterates accounted 88.1%, 85.7% among below matriculation and 76.5% among patients above matriculation. It was observed that Kolkata patients had less percentage of ID (78.9%) than patients of suburbs (85.3%) and districts (87.7%). In a reverse trend to ID, it was observed that RD was much more in males as compared to females. Those showing RD had similar trends across all groups. Patients residing in Kolkata showed less RD when compared to those residing in suburbs and districts. RD was more common in Muslims (89.3%) as compared to Hindus (80.9%). Increased age also resulted in RD; however the 51-60 age groups showed the highest delay (83.7%) among the various age groups.

	INITIAL D	ELAY (ID)			REFERRAL DELAY (RD)			
GENDER	Males No. (%) Females No. (%)			Males No. (%)		Females No. (%)		
	72 (84.7%)	29 (	87.9%)		73(85.9%)		25(75.8%)	
EDUCATION	Illiterates	Below mat	riculate	culate Above Illiterates Below		Below	Above	
	No. (%)	No. (%)		matriculation	No. (%)	matriculatio	on matriculation	
				No. (%)		No. (%)	No. (%)	
	52(88.1%)	38.1%) 36(85.7%)		13(76.5%)	49(83.1%)	35(83.3%)	14(82.4%)	
RESIDENCE	Kolkata	Suburbs	Districts	Districts		Suburbs	Districts	
	No. (%)	No. (%)	No. (%)		No. (%)	No. (%)	No. (%)	
	15(78.9%)	29(85.3%)	57(87.7%)		14(73.7%)	29(85.3%)	55(84.6%)	

RELIGION	Hindu	Muslim	Others		Hindu	Hindu			Others
	No. (%)	No. (%)	No. (%)		No. (%)	No. (%) No. (			No. (%)
	75(84.3%)	25(89.3%)	1(100%)		72(80.9%)	72(80.9%) 25(89.39		%)	1(100%)
AGE	<=40	41-50	51-60 years	>=61	<=40 years	41-5	50 years	51-60	>=61
GROUPS	years	years	No. (%)	No. (%)	No. (%)	No.	(%)	years	No. (%)
	No. (%)	No. (%)						No. (%)	
	6(75.0%)	29(87.9%)	36(83.7%)	30(88.2%)	6(75.0%)	28(8	84.8%)	36(83.7%)	28(82.4%)

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#### Discussion

The demographic data showed that male patients are more commonly affected by the disease which is in accordance to the studies published previously  $^3$  an obvious reason being more prevalent oral habits in Indian males.

Most of the patients (75.4%) were Hindu by faith probably because this religious community represents the majority of the population residing in West Bengal  $^{3,4}$ .

Half (50%) were illiterate making them more susceptible to the ill habits of tobacco and other risk factors <sup>6,7</sup>. A sizeable number of patients were referred from the districts owing to the lack of tertiary cancer care facilities in remote areas.

We noticed an increased incidence of oral cancer in the 51-60 years age group patients, a finding which is observed by Mehrotra<sup>8</sup>. This could either represent rising cancer rates in younger population or lack of care for older patients. Delivery of care to cancer affected older patients in this state requires to be further explored.

Remarkably high ID and RD were observed in our study. Similar studies across the globe have pointed out significant delay in diagnosis of oral cancer as reported by Evandro in 2007<sup>9</sup> Khoo SP in 1996 <sup>10</sup> .However, delay trends in West Bengal are much more prevalent than other parts of the country or world complicating treatment outcomes. "Hope of spontaneous healing", the most important cause of ID can be attributed to the initial painless nature of oral cancer. Majority of the patients belong to lower income group which justifies their concern for expenditure associated with cancer and prevented them from seeking treatment.

"Fear of diagnosis" as one of the causes of ID was a surprising finding in this study. We believe misconceptions about the treatment outcome of cancer and social stigma associated with the diseases are factors responsible for being fearful of the diagnosis. Proper social initiatives will be extremely important to alleviate fear and clear these misconceptions.

"Misdiagnosis by primary consultant" ranked top among causes of RD. Misdiagnosis was found to be an important cause of delay in numerous previous studies <sup>11,12,13</sup>. This finding is of serious concern because it underlines the inability of primary care physicians in making the initial diagnosis. Special continuing education sessions in this topic may be helpful in such a scenario. "Alternative forms of treatment" are rampant in the suburbs and districts of West Bengal which are frequently offered by unqualified persons and have gained popularity owing to their nominal cost. Connectivity with district headquarters and state capital with the remote corners of this state is still an issue though the situation seems to be improving.

The reasons for seeking treatment are similar to previous studies <sup>14,15</sup>.

Illiterate persons were more unlikely to seek diagnosis initially <sup>6</sup>. Education therefore is an important determinant in final outcome of the disease. As expected, people from the city proper were diagnosed earlier because of their proximity to quality medical care, availability of more number of doctors and increased awareness.

RD was found to be more common in males than females. One possible reason for this could be that males are frequently the sole source of income in the family unwilling or unable to attend for detailed check-ups.

Muslims showed more RD than Hindus probably owing to their different socioeconomic status. Increased age decreases independent mobility, decreased financial capabilities which are the most likely reason for the increased RD noted in elderly patients in this study.

As observed by searching literature review, the delay in diagnosis of oral squamous cell carcinoma is not isolated to one region or country. It can be found around the globe due to multiple factors <sup>16,17</sup>. A major interaction between head and neck cancer specialists, family doctors and dentists might be useful for reducing the diagnostic delay attributable to professionals <sup>18</sup>.

## Conclusion

There are various socioeconomic reasons of delay of diagnosis of OSCC. Lack of education of general population as well as lack of expertise of health professionals of all types contributes to delay and thus hampers prognosis. The relevant authorities and the government should take proper steps towards formulating policies in this regard. This will lead to better cure and decreased mortality rate of this dreaded disease.

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