Original Article

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An Observational Cross-sectional Study of Factors Causing Delay in Diagnosis of Head and Neck Cancers at a Rural Tertiary Care Centre in Northern India

Ear, Nose and Throat Section

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ABSTRACT

Introduction: Cancer is a complex genetic disease derived from the accumulation of a variety of genetic changes, which include activation of proto-oncogenes and inactivation of tumour suppressor genes. Head and Neck Cancers (HNC) are rapidly growing tumours with a median potential doubling time of only 6-7 days. Although these cancers are easily accessible, patients rarely present early. In India, most HNCs present in advanced stages resulting in increased morbidity and mortality. Hence, it is prudent to ascertain the factors which lead to delay in diagnosis of HNC as early diagnosis and treatment is the cornerstone in reducing consequences of HNC.

Aim: To identify patient and professional factors causing delay in diagnosis of HNC and to identify association if any with stage of cancer presentation.

Materials and Methods: An observational cross-sectional study was conducted in the Department of Ear Nose and Throat, at BPS Government Medical College for women, Sonepat, Haryana, India, from September 2019 to January 2021. Study included 55 newly diagnosed histopathologically confirmed head and neck cancer patients. Clinico-demographic details were inferred using elaborate clinical examination. Data were described in terms of range, mean±Standard Deviation (SD), frequency and relative frequency (percentages). Chi-square and Fisher's-exact test was used for comparing categorical data. Delay due to patient and professional factors were calculated separately and the association of each delay with important variables were compared.

Results: Total 55 newly diagnosed histopathologically proven primary HNC patients were included in the study. Most patients (43.6%) belonged to the age group of 51 to 60 years, and the mean age was 60.25±9.81 years. Majority of the patients were males (85.5%). The mean total delay from onset of symptoms to final diagnosis was 22.38±7.23 weeks. Delayed patient presentation was the main cause of total delay in diagnosis. The main factors responsible for patient delay were rural residential status, low formal education, socio-economic status and poor cancer awareness. Irrational therapies still contributed significantly for delayed patient presentation. Diagnostic delay led to upstaging of disease.

Conclusion: Patient delay is the main factor responsible for delay in diagnosis of HNC. Even in this era of easy availability and accessibility of information, lack of awareness still exists at the fundamental level.

Keywords: Patient delay, Professional delay, Stage, Tumour

INTRODUCTION

Cancer is a complex genetic disease derived from the accumulation of a variety of genetic changes, which include activation of proto-oncogenes and inactivation of tumour suppressor genes [1]. About 90% Head and Neck Carcinomas (HNC) are squamous cell carcinomas of the mucosa of the upper aerodigestive tract [2-4]. These include cancers of the oral cavity, oropharynx, nasopharynx, hypopharynx, larynx, nasal cavity and paranasal sinuses [5].

An estimated 2.1 million cases and 1 million deaths were attributed to HNC worldwide as per International Agency for Research on Cancer in 2020, contributing to 11% incidence of total body cancers and 10.6% of global cancer mortality [6]. Head and neck carcinomas exists globally but its prevalence is more in the Asian population. Total 57.5% of the global HNCs occur in Asia, 30-35% of which occur in India [7].

The high incidence of HNCs, especially oral and oropharyngeal cancers in the Indian community could be attributed to the role of tobacco in several forms, particularly in the form of bidi smoking (locally made tobacco rolled in betel leaf) and alcohol in the aetiology of HNC, the practice of which is widely rampant in the Indian population [8,9].

The HNCs are rapidly growing tumours with a median potential doubling time of only 6-7 days [10]. Although these cancers are easily accessible, patients rarely present early [10]. In India, 60 to 70% of HNCs present in the advanced stages resulting in increased morbidity and mortality [9]. It has been noted that the survival rates of HNC are widely variable in different communities, being lower in resource limited countries than developed ones [3].

Delay in diagnosis of HNC could occur at the level of patient, primary physician or final diagnosis. Patient delay is the interval between the patient first noticing his symptoms and consulting a healthcare professional [3]. Professional delay refers to the time interval between the patient's first consultation with a healthcare professional through final histopathological diagnosis to initiation of treatment. This includes doctor/practitioner/Primary Health Centre (PHC) delay which is the interval between first consultation and referral to a specialist trained in managing such cases [11-14] and system/hospital/specialist delay, which is the interval between first consultation with a specialist through final histopathological diagnosis to treatment initiation [3,8,11-15].

This study was henceforth undertaken as an attempt to ascertain the factors which led to delay in diagnosis of HNC as early diagnosis and treatment is the cornerstone in reducing consequences of HNC. Any delay may lead to advancement of stage requiring radical and disfiguring surgical treatment, recurrence of disease and adversely impacting quality of life [16-20].

MATERIALS AND METHODS

An observational cross-sectional study was conducted on 55 newly diagnosed patients of primary HNC who presented in the Department

of Ear, Nose and Throat, at BPS Government Medical College for women, Sonepat, Haryana, India. The study was undertaken from September 2019 to January 2021, after obtaining Ethical Committee approval (vide letter no. BPSGMCW/RC509/IEC/18).

Sample size calculation: Using n-Master 2.0 software, sample size based on the prevalence of head and neck cancer as 21.5% with 5% absolute error and 95% confidence interval, the required sample size was 55 [21]. Consecutive sampling technique was used in the study.

Inclusion criteria: All histopathologically proven cases of primary head and neck cancer were included in the study.

Exclusion criteria: Synchronous malignancy, recurrent malignancy, non consenting patients were excluded from the study.

Procedure

The suspected patient's demographic details regarding age, gender, residential, educational and socio-economic status were recorded. No formal education was defined as "illiterates", primary/middle school certificate was defined as "low formal education", and high school certificate/diploma as "formal education".

Questionnaire: Informed and written consent was taken followed by a personal interview questionnaire in the local language enquiring about the type, onset and duration of symptoms. A cancer awareness questionnaire was used to assess the level of cancer awareness in the patients [21]. The questions included were:

1. Do you know about cancer?
2. What causes cancer of aerodigestive tract?
3. What are the signs of these cancers?
4. Can you prevent cancer?
5. Where do you go for suggestion, doubts and treatment of cancer?

If three out of the five questions were answered, the patient was assumed to have good cancer awareness, a lesser score indicated poor awareness. Personal history was recorded and details about addictions were noted. Date and type of first consultation and irrational/unregistered therapies were taken, professional consultations and their type were recorded and confirmed.

A high index of suspicion regarding malignancy was maintained and a thorough clinical and radiological evaluation was done. Clinical suspects were then taken for biopsy and histopathological assessment. The date of biopsy and receipt of histopathology report was also recorded. If repeat biopsies were taken, a note was made regarding them.

TNM staging: Tumours were staged as per the Tumour Node Metastasis (TNM) System of Classification as per the American Joint Committee on Cancer (AJCC) and Union for International Cancer Control (UICC) 8th edition into stage I, II, III and IV. Stage I and II were grouped into early-stage cancer and stage III and IV were grouped into advanced stage cancer [22].

Patient delay: The patient delay was defined as the time interval between the perception of the first symptoms by the patient and the first consultation with a registered healthcare professional. Time taken for undergoing irrational/unregistered therapies was included in this.

Professional delay: The professional delay was defined as the duration between the patient's first consultation with a healthcare professional and confirmatory histopathological diagnosis. This incorporated Primary Health Centre (PHC) and system delay. The PHC delay was the duration when the patient approached their primary registered physician until contact with specialist for definitive diagnosis. System delay was calculated as the duration between the first specialist outpatient visit and confirmatory histopathological diagnosis.

All delays were calculated in weeks. Total delay was divided into 4 groups- less than 10 weeks, 10-20 weeks, 20-30 weeks and 30-40 weeks and proportion of patients in each group was determined. All variables were analysed to determine their association with patient, professional and total delay.

STATISTICAL ANALYSIS

The collected data were entered in Microsoft Excel spreadsheet. Data were described in terms of range, mean±standard deviation, frequency and relative frequency (percentages). To determine whether the data were normally distributed, a Kolmogorov-Smirnov's test was used, comparison of quantitative variables between the study groups was done using Mann-Whitney's U-test and Kruskal-Wallis test. Chi-square test was performed and Fisher's-exact test was used for comparing categorical data. A probability value (p-value) <0.05 was considered statistically significant. All statistical calculations were done using Statistical Package for Social Sciences (SPSS) version 21.0 (SPSS Inc., Chicago, IL, USA) statistical program.

RESULTS

Total 55 newly diagnosed histopathologically proven primary HNC patients were included in the study. Most patients (43.6%) belonged to the age group of 51 to 60 years, and the mean age was 60.25±9.81 years. Majority of the patients were males (85.5%). Regarding demography, most patients belonged to rural background, and had no formal education, although, 67.3% patients had good cancer awareness. Large proportion of patients had some form of addiction with smoking being most encountered [Table/Fig-1].

Variables	Number of patients, %
Age group (years)	
40-50	6 (10.9%)
51-60	24 (43.6%)
61-70	15 (27.3%)
71-80	10 (18.2%)
Mean age (SD) in years	60.25±9.81
Gender	
Females	8 (14.5%)
Males	47 (85.5%)
Educational status	
No formal education	33 (60.0%)
Low formal education	11 (20.0%)
Formally educated	11 (20.0%)
Socio-economic status (as per modified Kuppuswamy scale)	
Lower middle	32 (58.2%)
Upper lower	9 (16.3%)
Lower	14 (25.5%)
Site of lesion	
Oral cavity	3 (5.5%)
Oropharynx	37 (67.3%)
Larynx	12 (21.8%)
Hypopharynx	3 (5.5%)
Habits	
Non smoker, non alcoholic	1 (1.8%)
Smoker	46 (83.6%)
Smoker and alcoholic	8 (14.6%)
Stage of disease at presentation	
Stage I	8 (14.5%)
Stage II	14 (25.5%)
Stage III	19 (34.5%)
Stage IVa	14 (25.5%)

[Table/Fig-1]: Socio-demographic and clinical profile of study subjects (N=55).

Oropharyngeal cancer (67.3%) was the most commonly occurring followed by laryngeal cancer. All cases had squamous cell carcinoma with most commonly noted pathological grade being moderately differentiated carcinoma. Early stage cancer was seen in 40% patients (stage I: 14.5% and stage II: 25.5%) while 60% patients presented with advanced stage cancer (stage III: 34.5% and stage IVa: 25.5% patients). Vast proportion of laryngeal and oropharyngeal cancers presented in advanced stages in contrast to early presentation in oral cancers [Table/Fig-1].

About 60% patients had a previous non professional visit for unregistered/irrational therapies before presenting to a registered healthcare practitioner. The mean patient delay was 19.2±7.38 weeks, which was inclusive of this non professional consultation which accounted for about 3.85 weeks [Table/Fig-2].

Delay (weeks)	Mean	Standard deviation	Median (IQR)
Non reporting inspite of onset of complaints	15.35	6.21	14 (12-22)
Non professional consultation delay	3.85	4.68	2 (0-6)
Total patient delay (Non reporting+non professional consultation delay)	19.20	7.38	18 (13-24)
Primary Health Centre (PHC) delay	0.44	1.42	0 (0-0)
Biopsy procedure	1.56	1.49	1 (0.5-2)
Health practitioner's reporting	1.15	0.64	1 (0.90-1.2)
Repeat biopsy*	0.04	0.19	0 (0-0)
System delay (Biopsy procedure+Health practitioner's report+Repeat biopsy)	2.75	1.62	2.2 (1.5-3)
Total professional delay (PHC delay+System delay)	3.18	2.16	2.4 (1.7-4)
Total delay (total patient+total professional delay)	22.38	7.23	22.4 (15.4-27.5)

[Table/Fig-2]: Distribution of delay in the diagnosis of HNC (in weeks).
*one patient required repeat biopsy

The mean total professional delay (PHC and system delay) was found to be 3.18±2.16 weeks and ranged from 0.7 to 11 weeks. The mean PHC delay was 0.44±1.42 weeks. The system delay was 2.75±1.62 weeks and comprised of summation of time expended for taking and reporting biopsy, which was further compounded if repeat biopsies were taken. The mean duration taken to prepare a patient for biopsy of the lesion (biopsy procedure delay) was 1.56±1.49 weeks, and to prepare a histopathological report was 1.15±0.64 weeks. Mean delay due to repeat biopsy added 0.04±0.19 weeks. The mean total delay including patient and entire professional delay was 22.38±7.23 weeks [Table/Fig-2].

Upon evaluation of the relation between patient delay with various demographic and clinical characteristics, significant association was perceived with educational, residential and socio-economic status, cancer awareness and composite stage [Table/Fig-3]. The non professional consultation delay contributed largely to patient deferral was found to be significantly associated with educational level, socio-economic status, and composite stage. Patients belonging to lower socio-economic and educational strata postponed institutional treatment by seeking irrational/unregistered therapies. This inturn led to upstaging of disease [Table/Fig-4].

A median patient delay of 20 weeks was observed in rural, while it was found to be 22 weeks in those with no formal education. The patient delay decreased with improving educational and socio-economic status. Similarly, cancer awareness had a significant relation on patient delay with higher delay for patients with poor cancer awareness and lower for those with good cancer awareness [Table/Fig-3].

The professional delay was not found to be significantly associated with age, gender, residential, educational or socio-economic status, cancer awareness, smoking or drinking habits, site of lesion and cancer stage. Upon studying the total delay with various factors, it was found to be significantly associated with residential, educational

Variables	Category	Median delay in weeks	IQR (weeks)	p-value
Age	40-50 years	17.50	11-29	0.585
	51-60 years	16	13-21.75	
	61-70 years	22	16-26	
	71-80 years	20	12.75-28	
Gender	Female	26	15.75-29	0.109
	Male	17	13-24	
Locality of residence	Rural	20	17-28	0.0001*
	Urban	13.50	12-18.75	
Education	No formal education	22	17.5-28	0.0001*
	Low Formal education	14	12-22	
	Formally educated	12	10-14	
Socio-economic status	Lower Middle	14	12-21	0.001*
	Upper Lower	20	18-27	
	Lower	25	19.5-32.25	
Composite stage	Early	13	10-14.5	0.0001*
	Advanced	24	18.5-28	
Cancer awareness	Poor	25	20-30.5	0.0001*
	Good	16	12-21	
Addiction	Smokers	17	13-24	0.172
	Smoker & Alcoholic	21	17.5-28	
Site of lesion	Oral cavity	14	6	0.122
	Oropharynx	21	13-28	
	Larynx	19	13.75-20	
	Hypopharynx	14	12	

[Table/Fig-3]: Association between patient delay and other variables.
*p-value <0.05 was considered as statistically significant

Variables	Category	Median delay in weeks	IQR (Weeks)	p-value
Age (years)	40-50	2	0-4	0.652
	51-60	2	0-6	
	61-70	4	0-12	
	71-80	2	0-7	
Gender	Female	5.50	2-6	0.25
	Male	2	0-6	
Locality of residence	Rural	2	0-5.5	0.943
	Urban	3	0-6	
Education	No formal education	4	1-8	0.028*
	Low formal education	0	0-4	
	Formally educated	0	0-5	
Socio-economic status	Lower middle	0	0-5	0.041*
	Upper lower	6	2-8	
	Lower	2.5	1.5-12	
Composite stage	Early	0	0-5	0.012*
	Advanced	4	1-8	
Cancer awareness	Poor	3.50	2-10.5	0.300
	Good	0	0-6	
Addiction	Smokers	2	0-6	0.914
	Smokers and alcoholics	3.50	0-4.75	
Site of lesion	Oral cavity	5	0	0.215
	Oropharynx	4	0-6	
	Larynx	2	0-5.5	
	Hypopharynx	0	0-0	

[Table/Fig-4]: Association of non professional consultation delay with other variables.
*p-value <0.05 was considered as statistically significant

and socio-economic status, cancer awareness and composite stage. Median total delay was 26.4 weeks for patients with no formal education, 17.3 weeks for patients with low formal and 14 weeks for patients with formal education. Cancer awareness was also significantly associated with total delay, which was higher for patients with no cancer awareness [Table/Fig-5].

Variables	Category	Median delay in weeks	IQR (weeks)	p-value
Age (in years)	40-50	20.95	16.5-30.7	0.466
	51-60	19.20	15.0-25.6	
	61-70	25.50	22-28	
	71-80	23	14-29.775	
Gender	Female	29.60	18-32.975	0.102
	Male	22	15.1-26.5	
Locality of residence	Rural	25	19.45-29.95	0.002*
	Urban	15.75	14-24.325	
Education	No formal education	26.40	21-30.6	0.0001*
	Low formal education	17.30	14-24.2	
	Formally educated	14	14-16.4	
Socio-economic status	Lower middle	16.85	14-24.425	0.001*
	Upper lower	25.5	21.2-29.6	
	Lower	27.1	22.125-33.925	
Composite stage	Early	14.85	14-17.325	0.0001*
	Advanced	26.40	22.5-30.6	
Cancer awareness	Poor	27.75	23-32.325	0.0001*
	Good	17.40	14-25.4	
Addiction	Smoker	21.50	14.9-26.8	0.086
	Smoker and alcoholic	25.75	20.7-29.9	
Site of lesion	Oral cavity	16	8.3	0.089
	Oropharynx	24.50	15.3-29.9	
	Larynx	22.50	16.9-25.4	
	Hypopharynx	15.50	14	

[Table/Fig-5]: Association between total delay and other variables.
*p-value <0.05 was considered as statistically significant

It was also found that 46 (83.6%) of the cancer patients fell in the category of delay group 10 to 20 weeks and 20 to 30 weeks which is quite a substantial delay period for a disease like cancer.

DISCUSSION

The prognosis of HNCs predominantly depends on the stage of tumour at presentation [23]. Hence there is dire need of timely diagnosis and initiation of treatment which can reduce avoidable morbidity, mortality and huge treatment costs thereby leading to a better quality of life. In a country like India, where a sizeable population is exposed to the known risk factors like tobacco, betel quid and alcohol, it is prudent to identify factors which contribute to diagnostic delay of HNCs. This observational cross-sectional study was an attempt to recognise such factors causing delay in diagnosis so that effective timely interventions can be undertaken.

Demographics: In the present study, the mean age of the patients was 60.25 years and the study population comprised mainly of males, greater part of whom were from rural background with no formal education. Cancer awareness has been thought to play a major role in self-identification of symptoms and a considerable 67.3% of patients enrolled had good cancer awareness. The importance of cancer awareness in this study cannot be over emphasised. Joshi P et al., in their oral cancer study observed that 85% of the patients had noticed their oral lesion themselves. However, due to lack of cancer awareness, kept on ignoring their symptoms and did not present to a healthcare practitioner [24].

Oropharyngeal cancer was the most common site and all cases were reported to be of squamous cell variety, with moderately differentiated carcinoma being the most widely noted pathological grade. Total 40% patients presented with early stage cancer while 60% patients presented with advanced stage cancer in the current study. Agarwal AK et al., observed comparable findings, whereas Krishnatreya M et al., observed 49% advanced cancers in their study [4,25]. The major determinant of patient survival in HNC is the stage of the tumour at patient presentation. One of the major goals to identify factors responsible for delaying diagnosis is to decrease such late grade of presentation of HNCs which thereby cause more morbidity and mortality. Mean patient, professional and total delay was found to be 19.2 weeks, 3.18 weeks and 22.38 weeks respectively.

Patient delay: Patient delay was hence the main source of total delay in diagnosis of HNC at the present centre. Factors leading to patient delay were low educational and socio-economic status, rural residence as well as inadequate cancer awareness. Delayed presentation was also associated with upstaging of disease. The mean duration of complaints was 15.35 weeks and the patients took a mean time period of 3.85 weeks in seeking irrational/unregistered treatments before presenting to a healthcare practitioner. The patient delay was found to be significantly associated with residential status, educational status, socio-economic status, cancer awareness and stage of disease.

Patients from rural areas had a median patient delay of 20 weeks compared to that of 13.5 weeks for patients from urban areas. Inspite of the centre being located in rural heartland, delayed patient presentation was quite significantly observed in the patients. This can be ascribed to delayed symptom appraisal and low health seeking behaviour for people living in rural parts of India. Alahapperuma LS and Fernando EA in their Srilankan study, identified no effect of rural residence on delay in patient presentation and this was attributed to the universal accessibility of healthcare services in their country [12].

Regarding education and socio-economic status, inverse relation was seen with delay i.e., as education/socio-economic status decreased, delay increased. This could be attributed to inability to comprehend the gravity of the symptoms or not prioritizing health inspite of having unrestricted tertiary level treatment at government institutes. Similar observations were made by Krishnatreya M et al., [25]. However, patients with good cancer awareness presented to a healthcare practitioner with a median delay of 16 weeks compared to 25 weeks in others. Yu T et al., reported a low median patient delay of 4.5 weeks as two-thirds of these subjects visited their dentist annually, giving an insight into the high cancer awareness of the study population and accounting for the low patient delay [13]. Gilyoma JM et al., [5], Joshi P et al., [24] and Akram M et al., [14] also reaffirmed findings analogous to the current study and identified lack of cancer awareness as the leading cause of patient delay. Cancer awareness is an easily amendable factor in the Indian scenario, cognizance could be brought about by door-to-door health workers or awareness camps at the basic or community level.

Although it was noted that patients with oropharyngeal cancers deferred presentation more as compared to other cancers, this was not found to be statistically significant in our study. This observation is supported by studies of Brouha XD et al., and Allison P et al., who found longer patient delay in oropharyngeal cancers than that for oral cancer, owing to the lack of eminent symptoms in early stages of oropharyngeal cancer [19,26].

Another imperative observation was that delayed patient presentation also led to upstaging of the disease. Early cancers were associated with a median patient delay of 13 weeks as compared to 24 weeks in advanced cancers. Certain other studies also support this finding and hence it can be clinched that patient delay significantly affected the stage at presentation [3,12,17,19,25].

Irrational/unregistered treatments (non professional consultation) delay were a noteworthy part of patient delay. It was observed that 60% patients sought irrational therapies first and then presented to a healthcare practitioner. Low educational and socio-economic status was significantly associated with seeking alternate therapy [Table/Fig-5] which also led to significant upstaging of disease. The practice of seeking irrational treatments is infact so widespread that even cancer awareness did not play a significant role in preventing this behaviour. This could be accredited to widespread cultural and religious beliefs leading to practice of seeking such unregistered treatments. Gilyoma JM et al., similarly noted that 61.8% of the patients sought traditional therapy before presenting to the healthcare practitioner [5]. This rife practice of seeking treatment from unregistered practitioners is alarming, however this belief could be taken advantage of and such traditional practitioners could be incorporated as they are point of first contact in several Indian communities. Adequate training should be provided to them so as to not only identify but also notify cancerous symptoms which could help overcome this substantial barrier.

Professional delay: The professional delay was taken as a sum of PHC and system delay. The mean time taken for referral of a patient from primary health physician was 0.44 weeks, while the mean system delay was found to be 2.75 weeks resulting in a mean professional delay of 3.18±2.16 weeks. The professional delay was not found to be significantly associated with age, gender, locality of residence, educational status, socio-economic status, cancer awareness, smoking or drinking habits, site of lesion or composite stage.

The median professional delay although insignificant, was maximum for laryngeal cancer. This can be attributed to the need of specialised procedures such as endoscopic setup for diagnosis which are neither readily available at PHC level nor are all general physicians trained to perform such simple outpatient procedures conventionally. System delay could be ascribed to the fact that laryngeal growth obligated biopsy under general anaesthesia more often than other sites, which necessitates tedious time used for patient preparation.

Nieminen M et al., identified a longer professional delay due to false benign cytological and histopathological findings at the PHC level, multiple visits and delayed referral from PHC to specialist. Also, the time to treatment initiation was included in the professional delay, making it longer than the present study [18]. Study by Esmaelbeigi F et al., also by Lee SC et al., Yu T et al., and Joshi P et al., reported a higher mean professional delay owing to higher referral delay and lack of high index of suspicion on the part of the specialist [3,11,13,24].

The professional delay at the primary level ought to be tackled as this is a factor which can be readily obliterated through proper training and supply of facilities at the primary healthcare level. With the advent of flexible endoscopes, evaluation can be safely handled at the outpatient level by the primary healthcare physicians. Symptom identification in high-risk groups alongwith training and workshops regarding evaluation and diagnosis of such patients could be highly beneficial. Moreover, it could help reduce load on the tertiary level facilities as referral could be reduced resulting in streamlining of patient influx thereby causing decrease in system delay too.

Total delay: Mean total delay in present study was 22.38 weeks and patient delay was found to be the main factor accountable. The total delay was found to be significantly associated with residential, educational and socio-economic status, cancer awareness and stage.

Ganesan S et al., interestingly ascertained that both patient and professional delay contributed equally to the total delay. They attributed the shorter patient delay to the readily accessible health services in addition to high literacy levels in the study area [15]. A Srilankan study found mean total delay as 14.1±10.9 weeks in their study which was fairly low, crediting this to free healthcare services and universal accessibility of health services there [12].

In substantiation, Akram M et al., found patient delay as the main cause of diagnostic delay in HNC. The factors found significantly associated with patient delay were rural residence, lower socio-economic status, seeking alternate therapy and low cancer awareness analogous to the present study [14]. Saleem Z et al., [20], Kowalski LP and Carvalho AL [16], Agarwal AK et al., [4] and Lee SC et al., [11] also corroborate and conclude patient delay as the main cause of delayed diagnosis.

To summarize, this study helped us to clinch that delayed patient presentation is the main cause of delay in diagnosis of HNC. Patient delay was furthermore significantly associated with residential, educational and socio-economic status, cancer awareness as well as upstaging of disease. The practice of seeking irrational/unregistered therapies is still widespread and forms a major reason of patient delay. This delay led to upstaging of disease which would lead to increased morbidity and mortality. There is thereby need to overcome readily modifiable factors by collective effort of not only treating physicians but also primary care physicians, unregistered practitioners, healthcare or fundamental workers as well, to incite early diagnosis and improve prognosis of cancer patients.

Limitation(s)

The sample size was limited owing to a small proportion of patients reporting with head and neck cancer. Although the study population was adequate for the stipulated time frame, a larger study would have given more statistically significant results. Multicentric trial would also aid in not only a greater sample size but also overcome and ascertain the geographical limitations pertaining to a single centre study. Nevertheless, the current study achieved potentially useful new insight regarding delay factors in a readily accessible rural tertiary care centre and warrants special attention.

CONCLUSION(S)

To conclude, patient delay is the main factor responsible for delay in diagnosis of HNC. To curtail these factors is a daunting task but still a feasible target. Even in this era of easy availability and dispersibility of information, awareness still lacks at the basic level where patients are unable to access the designated free rural tertiary health centres for early diagnosis. This can be overcome by door-to-door drives by healthcare and ground level workers, awareness campaigns and taking into confidence and involving other non registered practitioners. There is also need to provide diagnostic amenities and appraisal at primary care physician levels to aid early diagnosis and decrease morbidity and mortality related to this menacing disease.

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