

## Delay in Diagnosis of Head and Neck Tumors

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### ABSTRACT

**Objectives:** To determine frequency of patients who consult at advanced stage [stage III or VI] of the disease and to identify factor responsible for late consultation

**Setting & duration:** CMH-Rawalpindi for a period of 1.5 years, between Jan-2009 to June-2010

**Design:** Cross-sectional survey

**Patients & methods:** All patients (n=88) with head & neck tumors presenting at Head & Neck/Oncology clinic, with a confirmed diagnosis of malignancy on the basis of histopathology were included in the study. Non-probability purposive sampling was used. Demographic characters of the patient such as age, gender, education, residence (Rural/Urban) and socioeconomic status were noted. Clinical stage of the disease was established after careful history taking clinical examination and radiological and endoscopic examination. Tumor in the category of Tx were excluded from the study. All patients were questioned about the time interval between appearance of first tumor related symptom and seeking medical advice from a qualified medical practitioner [Patient delay] and the time interval between first medical advice and diagnosis at specialist clinic. Statistical analysis was carried out using SPSS version-16, median, and mode were calculated for age, total delay in consultation. Frequencies were calculated for gender, education level. Socioeconomic status, stage and region of the tumor. Contingency table [Chi-sq test] was used to determine association between gender, socioeconomic status, education level, and tumor region and the delay in diagnosis; association with age and early and late presentation was calculated using univariate analysis on general linear model.

**Results:** Stage III and IV tumors together constituted 70.7% of total. Less than 5% of the cases were at stage-1. Median patient delay was 3-months [0.2-144] while median professional delay was found to be 1- month [0.2-71.5] No significant correlation was found between tumor stage and age, sex, education, socio-economic status and whether patient was from urban/rural background.

**Conclusions:** Our study confirms that majority of patients with Head & neck tumors present at a very late stage for treatment. Patient delay is significantly greater than the professional delay; thus patient himself/herself is largely responsible for the delay. No significant correlation between the stage of the tumor and age, sex, education, socioeconomic status and rural/urban background could be established. Further studies are needed to determine the cause of delay in diagnosis.

**Key words:** Delay diagnosis, head-neck tumors

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### INTRODUCTION

A large number of head and neck tumors are diagnosed at advanced stage of the disease<sup>1,2,3</sup>. This leads to great difficulty in their management as stage of the tumor is considered to be the most important determinant of the out-come of the treatment<sup>2,4</sup>. Explicably, more advanced is the stage of disease, more difficult will be the treatment. In surgical terms this would mean wider resection and a bigger challenge for reconstruction and rehabilitation. The situation is no different with other modalities of treatment i.e., Radiotherapy or chemotherapy.

Despite extensive research the factors responsible for delay in diagnosis, remain elusive. Some researchers have attributed it to use of alternative medicine<sup>5,6,7</sup>. Others have tried to establish a possible correlation between socio-demographic factors and the stage of tumor at the diagnosis<sup>8,9</sup>. However no conclusive results have been obtained.

Though the situation seems to similar or perhaps worse than that reported in literature, to best of our knowledge no such study has been carried out on our population. What is the magnitude of this problem in our population; what percentage of patients seeks consultation at late of disease? Who is responsible for the delay, the patient or the medical personnel? Can we establish any correlation between socio-demographic characteristics of our population,

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which of course is different from those in west, the stage of tumor? These are the questions which remain unanswered as far as our population is concerned and are the objectives of our research.

This study has important implications; apart from defining the magnitude of problem in our population, the study will decide whether patient themselves are to be blamed for the delay or is it because of the professionals. Finally, hypothesis can be generated about any causative factor for the delay in diagnosis, which will act as a bench mark for further studies.

Based on these results appropriate interventions can be launched at appropriate level to address this problem. This can possibly lead to lesser morbidity and mortality for head and neck tumors; as a corollary a reduction in the cost of treatment can be anticipated.

**MATERIALS & METHODS**

All new patients (n=88) with Head& Neck tumors presenting at Head& Neck/Oncology clinic, with a confirmed diagnosis of malignancy on the basis of histopathology, were included in the study . Sampling technique was purposive non-probability. Demographic characters of the patient such as age, gender, education. residence (Rural/Urban area ) and socioeconomic status were noted. Patients with income less than 10,000 per month were considered to be poor, those between >10,000-20000 per month were labeled as middle class while patients with income above this level were labeled as well-off. As far as education is concerned patients who could read newspaper and write were considered as educated. Clinical stage of the disease was determined after careful history taking, clinical examination and radiological and endoscopic examination. TNM system of classification was used was used for Squamous Cell Carcinomas.

Tumor in the category of Tx were excluded from the study. All patients were questioned about the time lapse between appearance of first tumor related symptom and seeking medical advice from a qualified medical practioner [Patient delay] Secondly the time interval between first medical advice and diagnosis at specialist clinic [Professional Delay] was noted ; later was based on history and medical documents in possession of the patient, where available.

The diagnosis was considered to be “early” if patient consulted at stage one or two of the disease and late, if clinical stage at the time of diagnosis was III or IV. Statistical analysis was carried out using SPSS version-16 mode and median were calculated for age, patient delay and professional delay and total delay Frequencies were calculated for gender , education level . socioeconomic status , stage and

region of the tumor. Contingency table was used to determine association between socio-demographic factors and early or late diagnosis. Relationship with age and stage of the tumor was determined using univariate analysis on general linear model. Wicoxin Signed Rank test was applied to compare the Patient delay with Professional delay; significance was tested at p-value of 0.05 [p≤0.05]. Results showing p-value of equal to or less than 0.05 were considered significant.

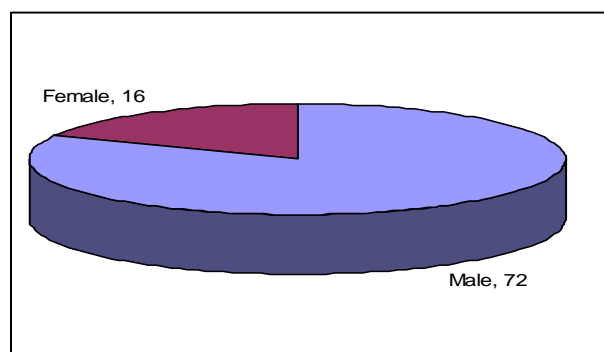
**RESULTS**

A total of 88 patients participated in the study (n=88) Median age at presentation was 58 years while mode was 60 years. Ages ranged from 17-86 years, thus covering a patient from nearly all age groups. Other Socio-demographic characteristics are presented in Fig-1. Only 5.7% were diagnosed at stage I and 21.6% at stage II. The percentage of patients presenting at stage III and IV was 39.8% and 33.0% respectively. Thus only 28.4% presented early [i.e., either stage I or II] while 71.6% of all patients presented late [stage III or VI]. Data regarding Tumor stage, early late presentation and tumor region is summarized in Fig. 2-4. The Median patient delay was 3-months [mode=1 month] while professional delay, which was 1-month [mode= 0.1 month] [Table-1]. Patient delay was found to be significantly greater than the professional delay [p=0.021] .Table-2. The results for cross-tabulation between socio-demographic characters and tumor region along with calculated significance after application of appropriate test of significance are shown in Table 3.

Table 1: Demographic characteristics of the patients: **Age**

N	88
Mean	56.77
Median	58.00
Mode	60
Std. deviation	13.51
Minimum	17
Maximum	86

Gender distribution



Socio-economic status

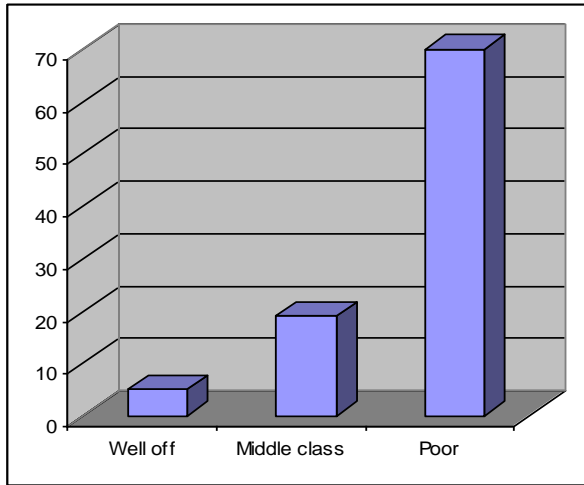
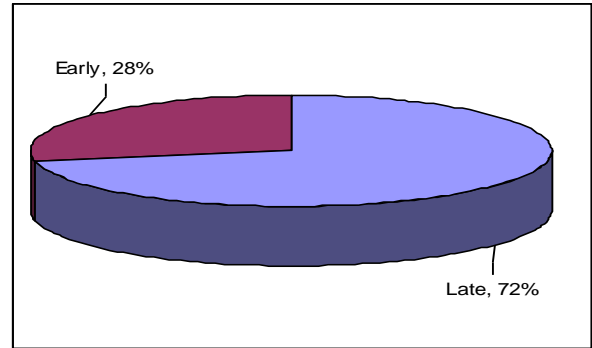


Fig-3: Early/Late presenting tumors:



Residence: Rural-urban

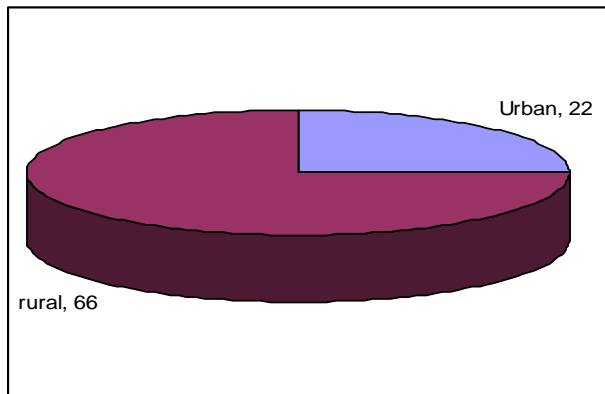


Fig-4: Tumor region:

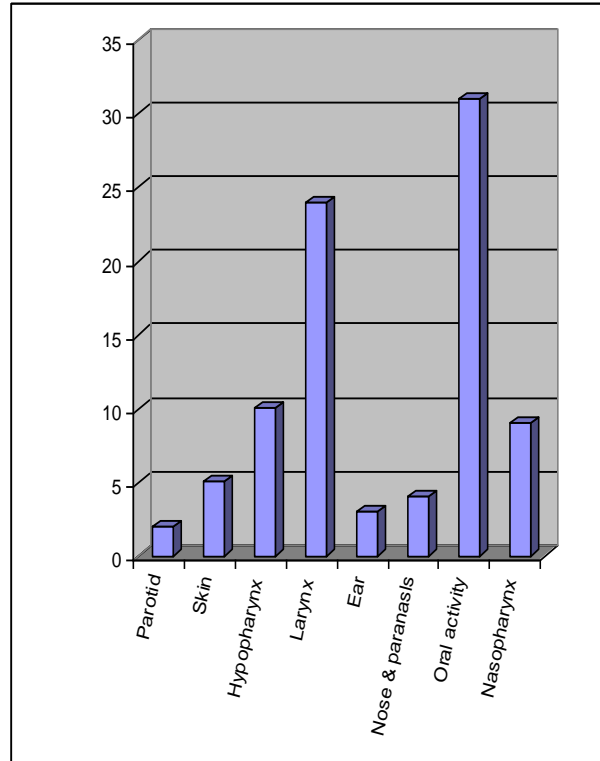


Fig-2: Tumor stage

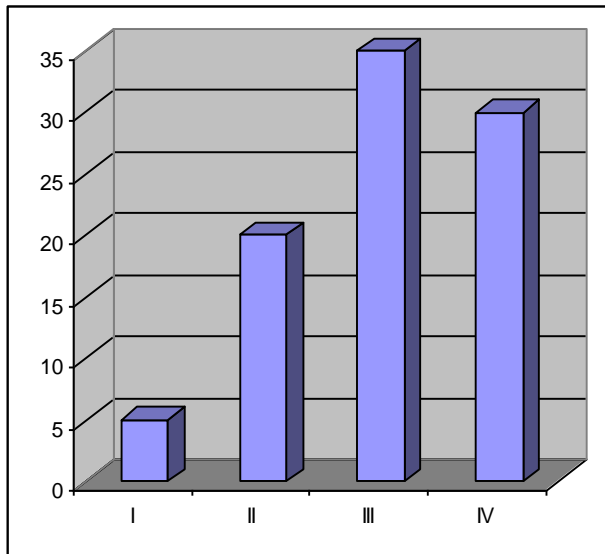


Table-1: Summary of Patient Delay and Professional delay

		Statistics		
		Patient Delay	Professional Delay	Total Delay
N	Valid	88	88	88
	Missing	0	0	0
Median		3.000	1.000	5.000
Mode		1.0	.1	5.0
Minimum		.2	.1	-9.0
Maximum		144.0	71.5	160.0

Table 2: Comparison of Patient and Professional delay after Wilcoxin Rank test

Test Statistics <sup>b</sup>	
	Professional Delay - Patient Delay
Z	-2.301 <sup>a</sup>
Asymp. Sig. (2-tailed)	.021

- a. Based on positive ranks.
- b. Wilcoxon Signed Ranks Test

Table 3: Statistical significance of socio-demographic factors Gender (Test applied: Pearson Chi Square)

Gender	Early	Late	Total
Male	21	51	72
Female	4	12	14
Total	25	63	88

Significance: 0.748

Educational status (Test applied: Pearson Chi Square)

Educational status	Early	Late	Total
Literate	5	13	18
Illiterate	20	50	70
Total	25	63	88

Significance: .947

Socio-economic status (Test applied: Pearson Chi Square)

	Early	Late	Total
well off		2	2
middle class	5	10	15
poor	20	51	71
Total	25	63	88

Significance: .614

Residence Rural-Urban ( Pearson Chi Square)

Residence	Early	Late	Total
Rural	17	49	66
Urban	8	14	22
Total	25	63	88

Significance: .415

Age (Test applied: Univariate analysis of variance)

Early	25
Late	63
Total	88

Significance: .894

Tumor region (Test applied: Pearson Chi-Square)

	Early	Late	Total
Ear	1	2	3
nose and sinuses	2	2	4
oral cavity	9	22	31
nasopharynx		9	9
larynx	9	15	24
hypopharynx	2	8	10
Skin	1	4	5
Parotid	1	1	2
Total	25	63	88

Significance: .484

## DISCUSSION

Delay in diagnosis in cases of head and Neck tumors is a common occurrence and has frequently been reported in literature <sup>1,2,3</sup>. A study in Nairobi regarding laryngeal and pharyngeal tumors , reported 96.4% of patients presenting at stage III or IV<sup>10</sup>.

The problem is not confined to the third world or the under developed countries; it is quite common in developed countries as well. Rogers SN, Yu 8, 11 Even in US, where access and affordability is not the problem, a large number of patient seek advice at late stage of the disease<sup>5,7</sup>. Similarly, a study carried out in Holland by Brouha and colleagues has demonstrated that incidence of stage-IV tumors is on the rise.<sup>12</sup> There are many other studies carried in developed countries which point to the same problem<sup>15,16</sup>.

In our series percentage of patients who were diagnosed at stage III or stage IV was 39.8 % and 33.0% respectively. This means nearly three quarter of our patients [73% to be precise] seek late advice at a very advanced stage of the disease; only about 5% of the cases were diagnosed at stage I of the disease , while nearly 21% were diagnosed at stage II.

This figure, though less than few African studies<sup>10</sup> is alarming because stage of disease is the major determinant of the outcome of the disease<sup>4</sup>.

Whether patients themselves or the professional are responsible for the delay , is the fundamental question to be answered. Studies from different countries have yielded different results<sup>10,12,17</sup>. In our study, the data regarding patient and professional delay was greatly skewed, ranging from 0.2-144 moths for the patient delay and 0.2-71.5 for the professional delay. Median delay was 3-months as far as the patients are concerned and 1-month for the professional delay. [mode being 1-month and 0.2 months respectively] These results show that patients themselves, were responsible for the delay in diagnosis. These results are similar to the majority of studies published, majority have shown that patient himself/ herself is largely responsible for delay in their treatment<sup>3,13,18</sup>.

However, our results regarding professional delay were different from those generally reported in literature. In our study the median professional delay was one month [mode 0.2]. This delay is less than the average professional delay reported in literature. In a study carried out at Brazil, comprising of 180 patients with head and neck tumors, the average professional delay was found to be nearly 70 days.<sup>4</sup> One study carried out in Nairobi , Kenya showed that average period of delay between the first medical attention at a primary health care facility and the first

appointment at the national hospital was 8.7 months. The study suggests that this long delay was due to inherent inefficiency in the referral system and was a major contributing factor for the advanced stage at the time of diagnosis<sup>10</sup>

Many other studies, even from the developed countries have reported a longer professional delay. In a study carried out in Canada comprising of 102 patients, a professional delay of 11.8 weeks on average, was noted<sup>11</sup>. Yu Goldstein D, working on similar problem has concluded that average waiting time for consultation at the specialist clinic has increased.<sup>17</sup> In our opinion shorter professional delay in our set-up can be attributed to lack of referral system by the GP as we have in UK or America.

Which patient or tumor attributes are responsible for delay in diagnosis? Different researchers have drawn different conclusions.

It can be hypothesized that patients with tumors located in the hidden or at relatively inaccessible sites consult the doctor at late stage of the disease, because the symptoms and signs may be not very obvious in the beginning. Brouha and colleagues have shown association between tumor site and the delay in diagnosis. Another study from Brazil has shown similar association<sup>1</sup>.

However this view has not been substantiated in our study; tumors located at hidden (for example hypopharynx, nasopharynx and larynx) as well as exposed places (lip and oral cavity) presented very late for consultation. For example we had 31 cases of tumor of oral cavity; among these 24 consulted at either stage III or VI of the disease. Oral cavity is very accessible place and amenable to inspection; despite that late consultation was as common as in other sites. This may be because of the reason that our patients do not regularly self inspect the oral cavity nor have regular dental check-ups. The need for regular visits to dentist has been emphasized by many researchers to avoid the possible delay in diagnosis<sup>11</sup>.

Delay in diagnosis has been reported even in cases where symptoms are very early and obvious; for example a substantial fraction of patients with glottic carcinomas present at advanced stage of the disease. This is despite the fact that hoarseness is an early warning symptom in tumors of this patient with advanced region. Nguyen-Tan in a series of 223 laryngeal carcinoma found that 122 were glottic lesions<sup>19</sup>.

This brings the focus on the educational level of the patient. It can be presumed that those who are better educated will probably will be more concerned about these early signs and seek an early advice. Ristvedt SL has found a marginal association between lack of education and late stage

presentation<sup>18</sup>. Though our criteria for education was very lax we found no correlation between the education level and the early or late presentation of the disease. [ $p=0.947$ ]

Besides formal routine education, awareness about tumor related symptoms is what seems to matter. Koscielny, in a series of 92 patients with head and neck cancers, observed that patients with better education had a longer interval between the onset of the first symptoms and the first consultation with a doctor and emphasized the need for better knowledge by patients about the first symptoms of a cancer of the head and neck<sup>11</sup>. Brouha in a series of 189 patients with oral and pharyngeal tumors found that many patients attributed the tumor related symptom to a minor infection or common cold and dismissed them as insignificant<sup>12</sup>. A study carried in US regarding Oral cavity tumors revealed that 87% of the patients did not have awareness about warning signs of oral tumors<sup>18</sup>. Many patients with oral cancers keep on delaying seeking advice because they presume that oral ulcers are insignificant and self healing<sup>9</sup>. Likewise, a study carried out in Holland showed that a number of patients with laryngeal cancers ignored persistent hoarseness: they attributed their symptom most<sup>11</sup>. This makes strong case for launching health education awareness campaigns so that people are aware of the tumor related symptoms.

Ignorance and lack of awareness about tumor related complaints can be considered to be differently distributed in urban and rural area, we determined the association between these two; regrettably, no significant relationship was found. Similarly we did not find any significant relationship between age, gender and the clinical stage of the tumor at the time of diagnosis [significance; 0.894 and 0.748 respectively]

Many researchers have focused on socioeconomic factors as the cause of delay. It is tempting to think that people who are affording and come from a sound financial background, consult at early stage of the disease. Some Studies have shown that lower socioeconomic group is associated with delay in diagnosis<sup>3,9</sup>. Even trivial factors like non-availability of transport have been shown to be responsible for delayed consultation<sup>9</sup>. However, other have reached opposite conclusion<sup>8</sup>. In our study, no significant association between socioeconomic status and whether patient consult early or late could be established.

In contrast with the common expectation that a greater total delay, will be associated with an advanced stage of disease, no such relationship was observed. Many patients with very advanced tumor gave a very short history of duration of symptoms

and vice versa. This paradoxical observation has been concurred by other authors as well<sup>20</sup>. In our opinion, in addition to other factors such as lack of awareness about tumor related symptoms, and self inspection, this can be perhaps attributed to recall bias on part of the patient, regarding actual duration of the symptoms.

Delay in presentation may be considered to be a health risk-taking behavior<sup>9</sup>. Though we did not consider this factor in our study, personality of the patient and his attitude towards the disease may play an important role in delay in consultation<sup>3,9,18</sup>. Certain patients may have a dispositional insensitivity to threat and may not seek medical advice for long time despite presence of the warning symptoms<sup>18</sup>. Rozniatowski found the patients who had low HAD scores (hospital anxiety depression scores) and less tendency for anxiety presented at advanced stage of the disease. The other factors considered to be important in personality traits by him are lower involvement of a spouse/partner, conscious delay before first consultation, greater social isolation and fewer medical visits<sup>3</sup>.

Afro mentioned discussion reflects that it is difficult to draw any conclusive evidence about the cause for delay. We feel that more extensive and detailed studies with larger number of patients should be carried out to identify factors because of which patients seek consultation at late stages of the diseases. Once identified appropriate interventions can be designed to bring about improvement in our results of the cancer treatment.

## CONCLUSION

Majority of patients with tumors present at a very late stage for treatment, patient delay is significantly greater than the professional delay; thus patient himself/herself is largely responsible for the delay. No significant correlation between the stage of the tumor and age, sex, education, socioeconomic status and rural/urban background can be demonstrated. So more extensive studies should be carried out to identify factors responsible for delayed consultation.

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