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Evaluation of Patient and Practitioner Delays in the Diagnosis of Head and Neck Malignancies: A Cross-Sectional Observational Study.

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ABSTRACT

Delayed diagnosis in head and neck malignancies remains a critical barrier to favourable oncological outcomes, significantly narrowing the therapeutic window and worsening patient prognosis. This study aims to systematically identify and analyse the specific psychological, socio-demographic, and systemic factors contributing to these delays in a tertiary care setting. A cross-sectional observational study was conducted on 50 patients diagnosed with head and neck malignancies at a tertiary care center between August 2022 and February 2024. For the purpose of this study, a "diagnostic delay" was explicitly defined as a chronological interval exceeding one month from the initial recognition of symptoms to the first formal medical consultation. Clinical and demographic data were gathered utilizing a pre-designed, structured questionnaire. The study cohort was predominantly male (82%) with the highest prevalence of malignancy occurring in the sixth decade of life (30%). A strong association with substance use was observed, predominantly tobacco consumption (54%). The cohort demonstrated a critical stage migration consequence due to delays, with 76% of patients presenting with advanced disease (32% at Stage 3 and 44% at Stage 4). The primary mechanisms driving delayed presentation included practitioner-related delays involving multiple primary care visits prior to specialist referral (44%), psychological barriers such as extreme fear and anxiety (28%), and socio-demographic constraints including financial and familial limitations (22%). Institutional or hospital-level delays accounted for only 6% of cases. A multi-pronged approach is essential to dismantle the barriers causing delayed cancer diagnoses. Strategic interventions must include public awareness campaigns to combat cancer-related fear, the deployment of community-level screening programs, and continuous diagnostic education for primary care practitioners to facilitate rapid specialist referrals.

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INTRODUCTION

Head and neck malignancies represent a formidable public health challenge and consistently rank among the leading causes of cancer-related mortality in India. According to the National Cancer Control Programme, the national epidemiological burden accounts for approximately 700,000 new cancer diagnoses and 300,000 deaths annually. While survival rates are heavily influenced by the availability of specialized healthcare infrastructure, screening program efficacy, and robust public health initiatives, delayed diagnosis remains a critical barrier to favorable oncological outcomes. For practicing otorhinolaryngologists, achieving optimal post-surgical results is directly contingent upon early intervention; unfortunately, when patients present with advanced-stage pathology, the therapeutic window narrows drastically, compromising both functional preservation and overall survival.

The conceptual framework for understanding these diagnostic delays draws upon the 2007 National Patient Safety Agency (NPSA) guidelines developed in the United Kingdom. The NPSA identifies delayed diagnosis as a multifaceted clinical failure encompassing several scenarios: when a symptomatic patient is not appropriately investigated or referred, when a clinical misdiagnosis occurs, when critical diagnostic data is inadequately communicated to the treating clinician, or when appropriate therapeutic action is not promptly initiated following a positive test result.

The academic literature further stratifies these delays into specific operational domains. Hansen et al. broadly categorize the cancer diagnostic pathway into three primary bottlenecks: patient-related delays, primary care practitioner delays, and system-level or hospital delays [1]. From a psychological and behavioral perspective, Andersen et al. delineate the patient delay continuum into five distinct phases: symptom appraisal, illness recognition, help-seeking behavior, scheduling delays, and treatment initiation delays [2].

Previous epidemiological studies by Amir et al. [3] and Onizawa et al. [4] indicate that the average delay in diagnosing head and neck malignancies spans from 1.7 to 5.6 months. Aligning with these benchmarks, the present study defines a "diagnostic delay" as a chronological period exceeding one month between the initial onset of symptoms and the first formal medical consultation.

The primary objective of this investigation is to systematically analyze the specific underlying factors driving these delays in head and neck cancer patients. These variables include symptom misinterpretation, socio-demographic barriers, psychological apprehension, and practitioner- or hospital-level inefficiencies. By identifying and highlighting these frequently underexplored clinical hurdles, this study aims to formulate actionable strategies that expedite clinical presentation, reduce disease incidence at advanced stages, and ultimately improve patient prognosis.

MATERIAL AND METHODS

Study Design and Setting

A cross-sectional observational study was conducted within the Department of Otorhinolaryngology at a tertiary care hospital. The clinical investigation spanned an 18-month period from August 2022 to February 2024. The study population comprised a total of 50 patients formally admitted to the ENT ward with confirmed diagnoses of various head and neck malignancies, encompassing carcinomas of the buccal mucosa, tongue, alveolus, thyroid, larynx, and tonsil.

Ethical Considerations

The research protocol was rigorously reviewed and approved by the Institutional Ethics Committee prior to the initiation of data collection. Comprehensive informed consent was obtained from all participating patients, ensuring full compliance with standard ethical guidelines for clinical research.

Eligibility Criteria

For the functional parameters of this study, a "diagnostic delay" was explicitly defined as a chronological interval of one month (30 days) or greater between the initial patient recognition of a symptom and their first consultation with a healthcare professional.

- **Inclusion Criteria:** The study cohort was strictly limited to patients presenting with a symptom duration of one month or longer prior to seeking medical evaluation.
- **Exclusion Criteria:** Patients presenting with symptoms lasting less than one month, individuals diagnosed with malignancies originating outside the head and neck region, and those who declined to provide informed consent were excluded from the study.

Data Collection and Clinical Evaluation

Primary data collection was executed utilizing a standardized, pre-designed patient questionnaire. This structured instrument was utilized to gather comprehensive sociodemographic profiles, including age, biological sex, marital status, socioeconomic background, and active addiction histories. To evaluate the specific mechanisms of delayed presentation, the questionnaire systematically tracked the time required for initial symptom recognition, psychological barriers such as disease-related anxiety and fear, the frequency of primary practitioner visits, and any systemic hospital-related delays.

A definitive diagnosis of malignancy was universally corroborated for all 50 patients through comprehensive histopathological examination. Following pathological confirmation, disease severity was standardized and staged utilizing the globally recognized Tumor, Node, Metastasis (TNM) classification system.

Statistical Analysis

The gathered clinical and demographic data were subjected to descriptive statistical analysis. Categorical variables, patient demographics, and the respective factors contributing to diagnostic delays were calculated and are graphically represented using absolute frequencies and percentage distribution tables.

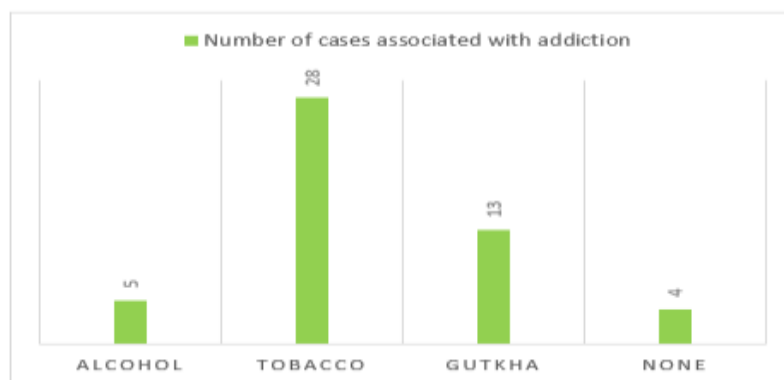
RESULTS

A total of 50 patients diagnosed with head and neck malignancies were admitted to the otorhinolaryngology ward and successfully enrolled in this study between August 2022 and February 2024.

Patient Demographics and Baseline Characteristics

The study cohort demonstrated a broad age distribution, with the highest prevalence of malignancies occurring in the sixth decade of life. Specifically, the 51–60 years age bracket constituted the largest demographic at 30% ($n = 15$), sequentially followed by the 61–70 years group at 24% ($n = 12$). The extremes of age were less frequently affected, with patients aged 21–30 years representing only 4% ($n = 2$) of the cohort. A pronounced gender disparity was observed within the study population; males accounted for a significant majority at 82% ($n = 41$), compared to females who represented 18% ($n = 9$).

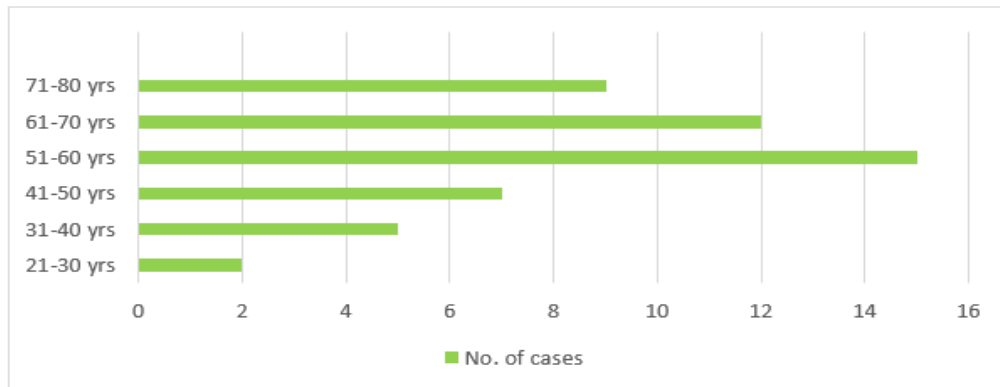
Figure 1: Age Distribution



Regarding addiction profiles and behavioural risk factors, the overwhelming majority of the delayed-presentation cohort had a documented history of substance use. Tobacco consumption was the

most prominent risk factor, present in 54% (n = 28) of the patients. This was followed by gutkha chewing in 26% (n = 13) and alcohol consumption in 10% (n = 5) of the cases. Only 8% (n = 4) of the patients reported no history of addiction.

Figure 2: Addiction Risk Profile



Clinical Staging at Presentation

Analysis of the clinical staging at the time of initial medical consultation revealed a high proportion of advanced disease, directly reflecting the consequences of diagnostic delays. Only a minority of patients presented in the early phases of malignancy, with Stage 1 comprising 10% (n = 5) and Stage 2 comprising 14% (n = 7) of the cohort. Conversely, the vast majority presented with advanced pathology; 32% (n = 16) were diagnosed at Stage 3, and a striking 44% (n = 22) presented with terminal-stage (Stage 4) disease.

Figure 3: Clinical Staging at Presentation

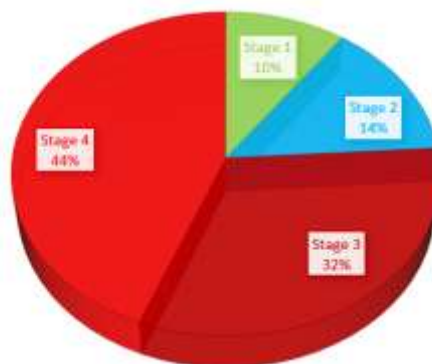


Table 1: Baseline Sociodemographic and Clinical Characteristics of the Study Cohort (n=50)

Variable	Classification	Number of Cases	Percentage (%)
Age Distribution (Years)	21-30	2	4%
	31-40	5	10%
	41-50	7	14%
	51-60	15	30%
	61-70	12	24%

	71-80	9	18%
Gender Distribution	Male	41	82%
	Female	9	18%
Addiction Risk Profile	Tobacco	28	54%
	Gutkha	13	26%
	Alcohol	5	10%
	None	4	8%
Clinical Stage at Presentation	Stage 1	5	10%
	Stage 2	7	14%
	Stage 3	16	32%
	Stage 4	22	44%

Evaluation of Delay Factors

The mechanisms driving a delayed diagnosis (>1 month) were categorized and quantified across psychological, sociodemographic, and systemic domains:

- **Psychological Delay:** Apprehension, fear of the diagnosis, and anxiety regarding treatment morbidity contributed to diagnostic delays in 28% (n = 14) of the patients.
- **Sociodemographic Delay:** Factors such as advanced age, lack of family support, and financial constraints caused presentation delays in 22% (n = 11) of the study population.
- **Practitioner Delay:** Initial misdiagnosis or delays in specialist referral at the primary care level were evaluated by tracking the number of prior practitioner visits. While 56% (n = 28) of patients presented directly to the tertiary center (0 prior visits), 36% (n = 18) experienced a delay after 1 prior practitioner visit, and 8% (n = 4) were delayed across 2 prior visits before achieving a definitive referral.
- **Hospital Delay:** Institutional barriers, such as delayed biopsy scheduling or prolonged cross-departmental consultations, were the least common cause of delay, occurring in only 6% (n = 3) of the cases.

Figure 4: Primary Drivers of Diagnostic Delay

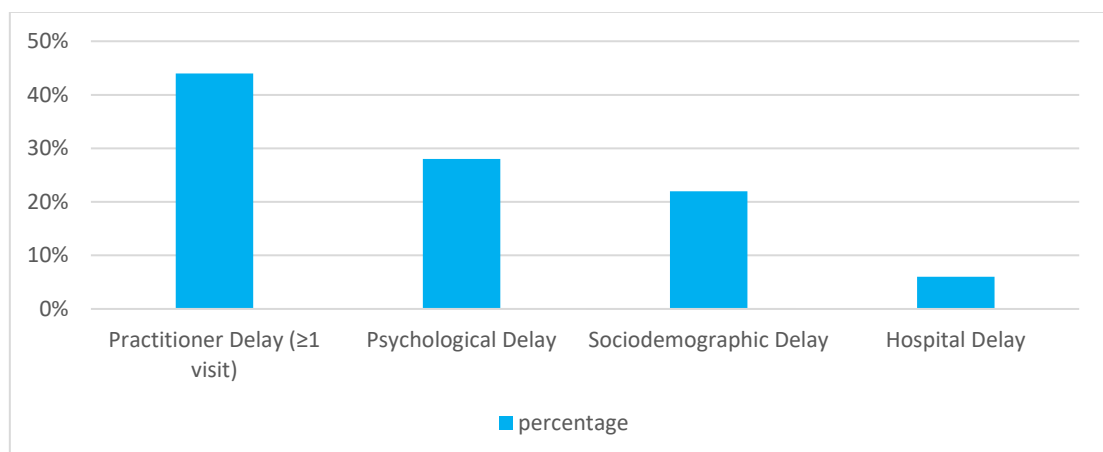


Table 2: Distribution of Factors Contributing to Diagnostic Delay (>1 Month)

Delay Category	Factor	Classification	Number of Cases	Percentage (%)
Psychological Delay		Yes	14	28%
	<i>(Fear and anxiety)</i>	No	36	72%
Sociodemographic Delay		Yes	11	22%
	<i>(Age, marital status, socioeconomic status)</i>	No	39	78%
Practitioner (Doctor) Delay		0 prior visits	28	56%
	<i>(Number of visits before referral)</i>	1 prior visit	18	36%
		2 prior visits	4	8%
Hospital Delay		Yes	3	6%
	<i>(Systemic or institutional factors)</i>	No	47	94%

DISCUSSION

The primary clinical mandate in managing head and neck malignancies is early detection, which significantly correlates with reduced treatment morbidity and superior long-term survival. However, the path from initial symptom development to definitive specialist evaluation is often fraught with complex psychological, socio-demographic, and systemic barriers. By benchmarking the clinical findings of the present cohort against the template study by Bajaj et al. [9] and broader international literature, this discussion elucidates the primary bottlenecks driving delayed oncological care in tertiary settings.

Epidemiological and Demographic Benchmarks

A comparative analysis of baseline demographics reveals a high degree of homogeneity between contemporary regional studies in India, confirming established epidemiological patterns for head and neck cancers.

- **Age Presentation:** In the current study, the sixth decade of life represented the peak period for malignant presentations, with the 51–60 years age bracket constituting 30% of the cohort. This data perfectly mirrors the findings of Bajaj et al. [9], who similarly reported that 30% of their study population fell within the identical 51–60 age demographic. These findings reinforce the clinical consensus that the cumulative mutagenic impact of prolonged carcinogen exposure typically manifests during late middle age.
- **Gender Distribution:** A pronounced male preponderance was noted in the current cohort at 82%, which tracks closely with the 77% male dominance documented by Bajaj et al. [9]. This high male-to-female ratio reflects traditional socio-behavioural dynamics in rural and semi-urban Indian populations, where the consumption of smoked or smokeless tobacco and alcohol remains heavily skewed toward the male demographic.

The Clinical Consequence of Diagnostic Delay

The direct, tangible consequence of protracted time-to-consultation (>1 month) is a catastrophic stage migration toward advanced disease by the time a patient achieves a definitive diagnosis.

In this series, a staggering 76% of patients presented with advanced-stage pathology (32% at Stage 3 and 44% at Stage 4). When juxtaposed with the data from Bajaj et al. [9]—where 85% of patients presented in advanced stages (32.5% Stage 3 and 52.5% Stage 4)—the reality of delayed presentation becomes starkly apparent.

Historically, several landmark otolaryngological series have examined the exact relationship between symptom duration and final tumor staging. Interestingly, while historical cohorts by Jovanovic et al. [5] and Brouha et al. [7] noted that prolonged patient delay does not automatically correlate linearly with an increase in absolute tumor size or lymph node metastasis in every biological subsite, it universally narrows the window for primary conservative surgery. The high volume of advanced presentations across both contemporary Indian cohorts underscores a systemic failure in early detection networks rather than variations in regional tumor biology.

Patient-Dependent Barriers: Psychological and Sociodemographic Factors

Patient-level delays are primarily driven by how an individual appraises their early symptoms and the psychological or structural barriers that prevent them from seeking prompt medical intervention.

Diagnostic Delay Components (Patient-Level)

- └ Psychological Barriers (28% in current cohort vs. 32.5% in Bajaj et al.)
- └ Socio-demographic Barriers (22% in current cohort vs. 45% in Bajaj et al.)

Psychological Apprehension

Psychological factors, specifically fear and deep-seated anxiety regarding the ultimate diagnosis, contributed to delays in 28% of the current patients. This aligns tightly with the 32.5% psychological delay index reported by Bajaj et al. [9]. As synthesized by Smith et al. [8], the fear of cancer-associated surgical morbidity (such as facial disfigurement or loss of voice) and the fatalistic dread of death often induce severe behavioural avoidance. Instead of seeking early care, patients frequently engage in a process of symptom denial, which significantly protracts the appraisal interval.

Sociodemographic Hurdles

Socio-demographic variables, including financial constraints, old age, and lack of family support, were responsible for treatment delays in 22% of the present cohort. Interestingly, this is lower than the 45% socio-demographic delay rate documented by Bajaj et al. [9], where a higher proportion of patients cited acute financial distress or an absolute lack of family infrastructure as their primary bottleneck.

While Hansen et al. [1] established a clear global predictability showing that lower socioeconomic status strongly dictates longer patient delays, the variance between our findings and Bajaj et al. suggests that regional shifts in healthcare accessibility, localized charity funding, or family structures can subtly modulate these socioeconomic hurdles.

Systemic and Professional Bottlenecks: Practitioner and Hospital Delays

Beyond patient-centric behaviours, the healthcare delivery system itself can introduce critical delays during the primary care screening or institutional workup phases.

Primary Practitioner Delays

Practitioner delay occurs when a primary care provider fails to recognize a potentially malignant lesion or delays direct referral to an otorhinolaryngologist. In the current investigation, while 56% of patients successfully bypassed primary care to present directly to a tertiary center, 44% experienced a

delayed trajectory involving multiple visits to general practitioners (36% required one visit and 8% required two or more visits before referral). This finding is statistically identical to the referral patterns in Bajaj et al. [9], where 55% presented directly, 35% were referred after a single visit, and 10% experienced prolonged primary care delays.

This consistent primary care gap highlights a major clinical vulnerability. As emphasized by Onizawa et al. [4], the initial frontline medical professional (including general practitioners and dentists) plays a foundational gatekeeping role. Misinterpreting early malignant changes as benign configurations—such as attributing a persistent ulcer to a simple aphthous lesion or a laryngeal symptom to a routine upper respiratory tract infection, as noted by Scott et al. [6] and Brouha et al. [7]—remains a major driver of preventable practitioner delay.

Hospital-Level Institutional Friction

Friction within tertiary care institutions represents the final potential bottleneck. Fortunately, hospital-level delays were remarkably low in both cohorts, occurring in only 6% of cases in this study and 5% of cases in the Bajaj et al. series. In both settings, institutional delays were predominantly driven by specific clinical complexities, such as overlapping diagnostic profiles (e.g., coexisting pulmonary tuberculosis requiring extensive clearance) or the logistical necessity for repeated deep biopsies when initial histopathological samples yielded inconclusive or necrotic tissue.

CONCLUSION

Addressing the high prevalence of advanced-stage head and neck malignancies requires a comprehensive, multi-disciplinary strategy to mitigate the underlying factors driving diagnostic delays. Public health initiatives and targeted mass media campaigns must be actively mobilized to alleviate the profound psychological fear and fatalism associated with a cancer diagnosis, continually reinforcing the clinical reality that early detection drastically improves therapeutic outcomes and overall survival rates. Furthermore, regional administrative authorities should prioritize the implementation of community-level screening camps to facilitate the early recognition of malignant symptoms.

Systemically, healthcare networks must be optimized to ensure that preliminary diagnostic facilities are highly accessible at the community level, while complex, definitive oncological management remains centralized in specialized tertiary institutions. Lastly, continuous medical education programs are essential for frontline and primary care practitioners, equipping them with the necessary diagnostic acumen to recognize early malignant changes and ensuring immediate, expedited referrals to specialized centers.

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