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A Prospective Study of the Outcome of Treatment among Patients with Hoarseness in A Tertiary Care Hospital

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Abstract
Introduction: *Hoarseness is the term used to describe a change in normal voice quality and it is invariably the earliest manifestation of a large variety of conditions directly or indirectly affecting the voice apparatus. Although patients frequently complain of hoarseness, it is a nonspecific term for a symptom and not a diagnosis. Since both benign and malignant lesions can produce hoarseness, proper evaluation is very important because delay in the diagnosis of malignancy can adversely affect the outcome.*
Materials and Methods: *This Prospective study was conducted in the ENT Department at Medical College, Kolkata. The study population has been calculated by using G-power software. The sample size was calculated with 80% of the power and 5% of the significance level. The total sample size was determined to be 75 patients with hoarseness of voice.*
Results: *The study population consisted of 58.7% males and 41.3% females with a mean age of 40.17±16.64 (range 8-76) years. Majority of the study population had tobacco chewing and smoking habit. Throat irritation was reported by majority (21.3%) of the subjects. Laryngitis was reported among many (17.3%) with 10.7% acute and 6.7% cases of chronic laryngitis, carcinoma larynx among 8.0%, vocal cord polyp among 17.3%, vocal cord cyst among 8.0%, vocal cord palsy among 13.3%, Reinke's edema among 10.7% and vocal nodule among 16.0% patients.*
Conclusion: *The study concluded that the symptoms of hoarseness of voice should never be ignored as it is the most common symptom in laryngeal malignancy.*
Key Words: *Hoarseness, laryngitis, carcinoma, vocal cord polyp.*

I. Introduction

Hoarseness is the term used to describe a change in normal voice quality and it is invariably the earliest manifestation of a large variety of conditions directly or indirectly affecting the voice apparatus.[1] Although patients frequently complain of hoarseness, it is a nonspecific term for a symptom and not a diagnosis. Since both benign and malignant lesions can produce hoarseness, proper evaluation is very important because delay in the diagnosis of malignancy can adversely affect the outcome. In India and other developing countries, the prevailing low economic status, poor nutrition, poor general health of population, different food habits, vocal habits, smoking and drinking habits, unhealthy environment and different social customs definitely influence the incidence of hoarseness.[2] The advent of fibreoptic telescope and stroboscope have reduced our dependence on mirror examination and greatly improved the diagnostic ability in cases of hoarseness.[3] With the introduction of micro laryngoscopic surgery and video laryngeal surgery (VLS) using LASER, coblator, etc., great advancement has occurred in the treatment of laryngeal pathologies leading to hoarseness.

Hoarseness can be divided into acute or chronic depending on the onset of symptoms. Acute onset is more common and mainly caused by infections like acute laryngitis, vocal abuse, laryngeal trauma or thyroid surgery. Chronic onset is mainly due to vocal cord nodule, polyp, laryngeal papillomatosis, chronic laryngitis, tumors of vocal cord, functional dysphonia, laryngopharyngeal reflux disease, neoplasm (thyroid, esophagus, lung etc), chronic granulomatous disease like tuberculosis or systemic disease like diabetes mellitus.[4] Chronic exposure of upper airway epithelium to tobacco smoke has been shown to induce premalignant morphological changes. These changes are accompanied by increasing chromosomal damage, which leads to formation of a population of metaplastic epithelial cells. It has also has been found that pulmonary alveolar macrophages are activated by cigarette smoke to produce superoxides and hydrogen peroxide which also cause oxidative damage to DNA and RNA and add to the risk of carcinogenesis.[5] The risks associated with cigarette smoking are also modified by alcohol consumption in a multiplicative manner. Alcohol ingestion increases cancer risk by increasing topical absorption of tobacco carcinogens and induction of microsomal enzymes, leading to increased

generation of tobacco carcinogens that bind to DNA. Because of this interaction, cigarette smoking should be examined within the context of alcohol consumption.[6] In light of the above mentioned factors, the present study was done to analyze the clinical profile, incidence of common etiological factors and their association with various causes of hoarseness of voice in a predominantly rural population of western UP attending our tertiary care institute.

II. Materials And Methods

This Prospective study was conducted in the ENT Department at Medical College, Kolkata. **Sample Size:** The study population has been calculated by using G-power software. The sample size was calculated with 80% of the power and 5% of the significance level. The total sample size was determined to be 75 patients with hoarseness of voice. The study subjects were chosen as per the inclusion and exclusion criteria as mentioned below:

Inclusion criteria:
All cases of hoarseness of voice irrespective of age & sex were included in the study after obtaining proper consent.
Exclusion criteria: Cases where surgery was indicated but patient was unfit or refused surgery.
Methods of data collection: The proforma was designed based on objective of the study and it was pretested and used after modification. As per enclosed proforma, the detailed history was taken followed by thorough ENT and systemic examination. Clinical diagnosis was arrived in support with the relevant investigations. The case history included the presenting complaints, history of present illness, history of past illness, personal history, family history and treatment history. The clinical examination included examination of throat by indirect laryngoscopy, examination of nose and ear. The endoscopic examination of throat was also done in every case. The patients were investigated by X-ray Chest (PA view) and X-ray neck (AP/Lateral view) where indicated. CT scan of neck and/or thorax was advised where indicated. The treatment included medical / surgical management depending upon the underlying pathology. The surgical specimen was sent for HPE where applicable and the results were correlated with clinical findings.
Statistical analysis: The data was entered into the Microsoft excel and the statistical analysis was performed by statistical software SPSS version 21.0. The Quantitative (Numerical variables) were present in the form of mean and SD and the Qualitative (Categorical variables) were present in the form of frequency and percentage. The Chi-square test was applied for comparing the frequency. The p-value was considered to be significant when <0.05.

III. Results

Table 1: Demographic profile of the study population

		Frequency	Percentage
Gender	Male	44	58.7%
	Female	31	41.3%
Location	Rural	43	57.3%
	Urban	32	42.7%
Age	0-10 years	1	1.3%
	11-20 years	9	12.0%
	21-30 years	17	22.7%
	31-40 years	15	20.0%
	41-50 years	13	17.3%
	51-60 years	13	17.3%
	61-70 years	4	5.3%
	More than 70 years	3	4.0%
	Mean ± SD	40.17±16.64 (8-76)	
Marital Status	Unmarried	15	20%
	Married	60	80%
Occupational Status	Engineer	1	1.3%
	Farmer	13	17.3%
	House wife	22	29.3%
	Shopkeeper	14	18.7%
	Singer	1	1.3%
	Student	16	21.3%
	Teacher	8	10.7%

Table 2: Distribution of personal habits among study population

Personal Habit	Frequency	Percent
No	**39**	**52%**
Alcohol	**4**	**5.3%**
Alcohol, tobacco chewing	**1**	**1.3%**
Smoking	**10**	**13.3%**
Smoking, Alcohol	**10**	**13.3%**
Tobacco Chewing	**10**	**13.3%**
Tobacco chewing, Smoking, Alcohol	**1**	**1.3%**
Total	**75**	**100%**

Table 3: Distribution of complaints among study population

Complaints	Frequency	Percent
No	21	28%
Cough	10	13.3%
Dysphagia	7	9.3%
Fever	3	4.0%
Odynophagia	4	5.3%
Throat Irritation	16	21.3%
Throat pain	13	17.3%
Weight loss	1	1.3%
Total	75	100%

Table 4: Distribution of diagnosis among study population

Diagnosis	Frequency	Percent
Acute Laryngitis	8	10.7%
Chronic Laryngitis	5	6.7%
Carcinoma larynx	6	8.0%
Functional Aphonia	2	2.7%
Keratosis of posterior Commissure	1	1.3%
Vocal Cord Polyp	13	17.3%
Vocal Cord Cyst	6	8.0%
Vocal Cord palsy	10	13.3%
Laryngopharyngeal reflux (LPR)	1	1.3%
Reinkes Oedema	8	10.7%
Vocal Cord Papilloma	1	1.3%
Tubercular Laryngitis	1	1.3%
Ventricular Dysphonia	1	1.3%
Vocal Nodule	12	16%
Total	75	100%

Table 5: Distribution of histopathological diagnosis among study population

Surgery	Frequency	Percent
No	**40**	**53%**
Yes	**35**	**47%**

The study population consisted of 58.7% males and 41.3% females with a mean age of 40.17±16.64 (range 8-76) years. Majority of study population belonged to 21-30 years (22.7%) and 31-40 years (20.0%) age groups. 80.0% of the subjects were married. Majority of the subjects were housewives (29.3%) followed by students (21.3%), shopkeepers (18.7%), farmers (17.3%) and teachers (10.7%). [Table 1]

Alcohol habit was found among 5.3%, alcohol & tobacco chewing among 1.3%, smoking alone among 13.3%, smoking & alcohol among 13.3%, tobacco chewing alone among 13.3% and tobacco chewing, smoking & alcohol habit among 1.3% patients. [Table 2]

Throat irritation was reported by majority (21.3%) followed by throat pain among 17.3%, cough among 13.3%, dysphagia among 9.3%, odynophagia among 5.3%, fever among 4.0% and weight loss among 1.3% subjects. [Table 3]

Laryngitis was reported among 17.3% with 10.7% acute and 6.7% cases of chronic laryngitis, carcinoma larynx among 8.0%, functional aphonia among 2.7%, keratosis of posterior commissure among 1.3%, vocal cord polyp among 17.3%, vocal cord cyst among 8.0%, vocal cord palsy among 13.3%, Reinke's oedema among 10.7%, laryngopharyngeal reflux (LPR) among 1.3%, vocal cord papilloma among 1.3%, tubercular laryngitis among 1.3%, ventricular dysphonia among 1.3% and vocal nodule among 16.0% patients. [Table 4]

Histopathology showed that keratosis without dysplasia was found among 1.3%, vocal cord cyst among 1.3%, vocal cord polyp among 18.7%, Reinke's oedema among 5.3%, retention cyst among 1.3%, right

aryepiglottic fold cyst among 1.3%, right intracordal cyst among 2.7%, right vocal cord papilloma among 1.3%, tubercular laryngitis among 1.3%, vocal nodule among 4.0% and squamous cell carcinoma among 8.0% patients [Table 5]. Surgery was done for 47% patients.

IV. Discussion

In our study, the age of patients with hoarseness of voice ranged from 8 to 76 years majority of patients i.e. 31 % cases were in the group of 19-30 years and minimum number of patients i.e. 2 % case were in the age of group of <10years.[7]

In a study by Baitha et al, majority of patients i.e. 31 cases (28.18%) were in the age group of 31-40 years. In a study by Ghosh et al, maximum patients i.e. 28 cases (28%) were in the age group of 21-30 years.[8]

In the study by Amarnath and Purushotham, the age of patients with hoarseness of voice ranged from 9 to 85 yrs. Majority of patients i.e. 40 cases (26.66%) were in the group of 41-50 years and minimum number of patients i.e. 2 cases (1.33%) were in the age of group of <10 years.[9]

In our present study, 58.7% patients were males and 41.3% patients were females, thus male to female ratio of approximately 1.4:1 was observed. This finding was similar to the study done by Baitha et al, where 74 cases (67.27%) were males and 36 (32.72%) were females. Amarnath and Purushotham found in their study that 66% were males and 34% were females.[28] Thus male to female ratio of approximately 2:1 was observed and Babuet al, found the male female ratio to be 1.89:1.[10]

In our study, majority of patients (29.3%) were housewives and least i.e. 1.3% cases were singer and engineer. It was similar to the study done by Ghoshet al, where majority of patients were housewives (29%). This was contrasting to the study by Baitha et al, where majority of patients were of labourer class (36.36%) and in the study by Amarnath and Purushotham, the majority of patients i.e. 64 cases (42.66%) were again of manual laborer class.

In our study about 57.3% patients were from rural area and 42.7% patients were from urban area. This was similar with the studies done by Amarnath and Purushotham, where majority of patients i.e. 90 cases (60.00%) were from rural area and 60 cases (40.00%) were from urban area and Baitha et al also found that predominantly patients were from rural areas comprising of 83 cases (75.5%). Some studies have mentioned inhaled irritants especially cigarette smoke as most important predisposing factors for hoarseness.[11]

In our present study commonest habit noted was smoking which was seen in 28.0% patients followed by alcohol among 21.3% and habit of tobacco chewing in 16.0% of patients. In the study done by Baitha et al, smoking was noted in 25.45% of cases, chewing tobacco preparation in 17.27% and alcohol in 12.72%. Parikh found that smoking was associated with hoarseness in about 20% of cases only and history of vocal abuse was much higher at 56%. Conversely, Amarnath and Purushotham reported that the commonest habit noted was smoking in 53.33% cases and history of vocal abuse was very low (20%). In the study by Banjara et al, smoking and vocal abuse were the predisposing factor in 43% and 31% cases respectively followed by alcohol (29.48%), tobacco/gutkha (29.48%), and URI/septic foci (17.13%). A study by Urrutikoetxea et al, on 1046 teachers found that smoking was associated with the presence of a vocal nodule; the more cigarettes they smoked, the more likely they were to have vocal pathology.

V. Conclusion

The study concluded that the symptoms of hoarseness of voice should never be ignored as it is the most common symptom in laryngeal malignancy. Any patient with hoarseness should be thoroughly investigated to rule out malignant conditions and conditions that might cause respiratory distress leading to life threatening complications.

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