

A Clinicopathological Study On Voice Disorders In A Tertiary Care Hospital

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ABSTRACT

Background

Voice - the fundamental element of communication among human species is the result of a complex product of the vibratory mechanisms of vocal folds modified and resonated by the rest of the vocal tract¹

OBJECTIVES

- Etiological pattern of voice disorders with special reference to occupation.
- Clinical pattern of voice disorders.

MATERIAL & METHODS:

Study Design: Prospective Observational study.

Study Area: The study was done in Department of E.N.T, MKCG, MCH, Brahmapur, Odisha. **Study Period:** 1 year. **Study population:** patients with complaints of change in quality of voice/ difficulty in phonation, attended to the department of Otolaryngology, MKCG, MCH, BRAHMAPUR, ODISHA. **Sample Size:** A total of 240 were included in the study.

Study tools and Data collection procedure: All patients with complaints of change in quality of voice/ difficulty in phonation were interrogated with a detailed history followed by a complete thorough examination. VHI-10 questionnaire was given to every patient for a subjective evaluation of extend of the disease GRBAS grading system was conducted for a semi-objective assessment of the disorder.

RESULTS

Most common aetiology found in our study was chronic laryngitis (25.4%) followed by carcinoma larynx/hypopharynx (22.5%), followed by vocal cord paralysis(13.3%), vocal cord nodules (10.8%), acute laryngitis (7.1%), vocal cord polyps (5.8%), vocal cord cysts(4.2%), sulcus vocalis (1.7%), TB laryngitis (1.7%), puberphonia (1.7%),

granuloma (1.25%), reinke's edema (1.25%), muscle tension dysphonia(1.25%), psychogenic dysphonia(1.25%) and spasmodic dysphonia(0.8%).

CONCLUSION

To conclude, with its vast etiology, dysphonia is often just the "tip of the iceberg" for a much greater underlying disease process and should therefore always be scrutinized in every patient. For treating doctors and health care workers in rural areas, the results of this study serve as a reminder as well as an insight into the possible differential diagnosis for dysphonia based on age and gender of the patient.

KEYWORDS

Voice Disorders, dysphonia, acute laryngitis.

INTRODUCTION

Voice - the fundamental element of communication among human species is the result of a complex product of the vibratory mechanisms of vocal folds modified and resonated by the rest of the vocal tract.¹ The normal voice should possess certain characteristics of pitch, loudness and quality which make clear meaning and elicits an emotional response to ensure a pleasant tonal effect upon the listener.

Normal voice production requires three essential elements²:

1. A pressure gradient across the vocal folds created by the flow of expired air from the lungs against the partly closed vocal folds.

2. Vocal folds of appropriate structure, mass and elasticity that approximate with appropriate tension to allow them to vibrate at a range of frequencies. 3) A resonating chamber, the vocal tract, whose size and shape can be changed to modulate the acoustic properties of sound generated by the vocal folds.

Every human voice is unique because of anatomical, physiological, psychological, cultural, sociolinguistic and behavioural factors. In addition a wide range of information about the speakers' gender, age, personality, emotional status and physical health is conveyed by their voice quality, pitch range and the systematic use of pitch patterning (intonation)¹.

PATHOLOGICAL VOICE

It is defined as one that does not fulfil the above criteria. Variations in voice quality can provide valuable cues about our current emotions, physical health and psychological well-being. Patients generally seek a consultation about their voice complaint because it causes one or more of the following problems³:

- **Impairment** - an alteration in the structure or function of the vocal apparatus (structural abnormality, inflammation, neuromuscular abnormality or muscle tension imbalance) causing symptoms such as hoarseness of voice, a weak voice, pitch change, throat discomfort.
- **Limitation in activity** - such as reduction in vocal range in singing or the voice tiring or becoming hoarse with prolonged use in noisy environment or if raised
- **Participation restriction** - not being able to work or sing in a choir as a result of the voice problem.

Voice disorders are defined as any time the voice does not work, perform, or sound as it normally should, or interferes with communication and quality of life^{4,5}. Disorders of voice is an important symptom encountered in the daily ENT clinic. The cause range from the innocuous self-limiting and usually reversible infective laryngitis to debilitating malignant tumours of the larynx. An early detection of the cause could help in early intervention as well as an early recovery for a better quality of life. It is of utmost importance in our Indian society where Carcinoma larynx is rather a common occurrence and hence the importance of early detection is further emphasised.

When voice becomes disordered, the effort for communication increases. When the voice deteriorates or is disordered as a result of strain or pathological changes the whole personality suffers with it giving rise to feelings of inadequacy and insecurity. Voice disorders in those who depend upon good speech for their livelihood like the teachers, salesmen, singers and professional workers produce quite obvious anxieties on account of the serious professional and economical hazards involved.

Thus, this study was undertaken to study the aetiopathological and clinical picture of various presentations of voice disorders, their predisposing factors and methods for early diagnosis so that appropriate preventive and treatment measures could be initiated for a better quality and sound life for people.

Objectives

- Etiological pattern of voice disorders with special reference to occupation.

- Clinical pattern of voice disorders.
- Association with predisposing factors.
- Diagnostic methodology used for voice disorders.

MATERIAL & METHODS

Study Design

Prospective Observational study.

Study Area

The study was done in Department of E.N.T, MKCG, MCH, BRAHMAPUR, ODISHA.

Study Period

1 year.

Study Population

Patients with complaints of change in quality of voice/ difficulty in phonation, attended to the department of Otolaryngology, MKCG, MCH, BRAHMAPUR, ODISHA.

Sample Size

A total of 240 were included in the study.

Sampling Method

Simple Random sampling method.

Inclusion Criteria

All the cases with disordered voice between 4-80yrs of age attending ENT OPD and referred by various specialities were included in the study.

Exclusion Criteria

- Patients with speech defects/congenital voice disorders
- Patients unwilling to participate In the study/examination
- Nasal/nasopharyngeal/oropharyngeal pathology
- Tarcheostomised patients

Ethical Consideration

Institutional Ethical committee permission was taken prior to the commencement of the study.

Study Tools and Data Collection Procedure

All patients with complaints of change in quality of voice/ difficulty in phonation were interrogated with a detailed history followed by a complete thorough examination. VHI-10 questionnaire was given to every patient for a subjective evaluation of extend of the disease GRBAS grading system was conducted for a semi-objective assessment of the disorder. IDL followed by endoscopic laryngoscopy was the predominant investigation of choice along with other relevant routine and imaging

techniques to arrive at a diagnosis. Those patients requiring elaborate work up or Direct laryngoscopy for confirmation were admitted as in patients.

Statistical Analysis

The data was collected, compiled and compared statistically by frequency distribution and percentage proportion. Quantitative data variables were expressed by using Descriptive statistics (Mean \pm SD). Qualitative data variables were expressed by using frequency and Percentage (%).

RESULTS

Sl. no.	Age groups (years)	Male	(%) Male	female	(%) female	No. Of cases	(%) cases
1	<10	0	0	0	0	0	0
2	11-20	19	7.9	11	4.6	30	12.5
3	21-30	26	10.8	14	5.7	40	16.5
4	31-40	24	10	22	9.2	46	19.2
5	41-50	39	16.3	15	6.3	54	22.6
6	51-60	40	16.7	6	2.5	46	19.2
7	>60	20	8.3	4	1.7	24	10
	Total	175	70	72	30	240	100

Table 1: Age and Sex Distribution among Voice Disorder Patients

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Majority of patients were seen in the age group of 30-60 years (61%) and most commonly in the 5th decade of life(22.6%).The age of patients ranged from 14 to 85 years. Male predominance was observed with Male: Female ratio 2.3:1.

Sl no.	duration	No. of cases	% cases
1.	0-24 hours	7	2.9
2	1-7 days	32	13.4
3	1-4 weeks	62	25.8
4	1-6 months	107	44.6
5	6-12 months	21	8.7
6	>1year	11	4.6

Table 2: Duration of Hoarseness

Duration of hoarseness was recorded in days, weeks, months, years. 44.6% of cases had a duration between 1-6 months

Sl no.	VHI-10 score	No. Of patients	% cases
1.	0 - 11	2	0.8
2.	12 - 30	75	31.3
3.	31 - 60	106	44.2
4.	61 - 120	57	23.7
	TOTAL	240	100

Table 3: VHI-10 self-assessment scores

According to the self-assessment questionnaire, majority of the patients came under the moderate level of disability (44.2%), followed by mild (31.3%) and severe voice disorder (23.7%). the 2 patients who came within the normal range of VHI score were puberphonia patients.

GRBAS	0	1	2	3	TOTAL
G	7	10	153	70	240
R	8	70	119	43	240
B	78	74	87	1	240
A	43	149	43	5	240
S	51	106	73	10	240

Table 4: GRBAS Grading Scores among Patients

In our study, according to this perceptual evaluation, majority of the patients' disorder in voice came under moderate degree which could be comparable with the self-assessed VHI-10 score.

Sl no.	laryngoscopic findings	no. of cases	(%) of cases
1	congested/inflammed larynx	81	34.2
2	VC thickenings/nodules/polyps/ granuloma	56	23.3
3	laryngeal/hypopharyngeal growth	54	22.5
4	impaired VC mobility	32	13.3
5	sulci	4	1.7

Table 5: Laryngoscopic Findings

The commonest picture was congested larynx/inflamed larynx(34.2%), followed by thickening, nodule,polyp or granuloma on the surface of vocal cord(s) constituting 23.3%, growth in the larynx or hypopharynx(22.5%)and impaired mobility of vocal cords(13.3%) and 1.7% of sulcus vocalis.

Sl. No.	aetiology	no. of cases	% cases
1.	Chronic laryngitis	61	25.4
2.	Ca larynx/hypopharynx	54	22.5
3.			
4.	VC palsy	32	13.3
5.	VC nodule	26	10.8
6.	A/c laryngitis	17	7.1
7.	VC polyp	14	5.8
8.	VC cysts	10	4.2
9.	sulci	4	1.7
10.	TB laryngitis	4	1.7
11.	puberphonia	4	1.7
12.	Reinke's edema	3	1.25
13.	granuloma	3	1.25
14.	muscle tension dysphonia	3	1.25
15.	psychogenic dysphonia	3	1.25
16.	spasmodic dysphonia	2	0.8
Table 6: Etiology of Voice Disorders			

most common aetiology found in our study was chronic laryngitis(25.4%) followed by carcinoma larynx/hypopharynx (22.5%), followed by vocal cord paralysis (13.3%), vocal cord nodules (10.8%), acute laryngitis (7.1%), vocal cord polyps (5.8%), vocal cord cysts (4.2%), sulcus vocalis(1.7%), TB laryngitis (1.7%), puberphonia (1.7%), granuloma (1.25%), reinke’s edema (1.25%), muscle tension dysphonia (1.25%), psychogenic dysphonia (1.25%) and spasmodic dysphonia (0.8%).

Smoking	Chronic Laryngitis		Total (no. Of cases)
	Present	Absent	
Present	42	101	153
Absent	19	75	87
Total	61	179	240
<i>Table 7: Association between Smoking and Chronic Laryngitis</i>			

Fisher’s exact test was applied. Two tailed p value is 0.000. The association is found to be “significant”

Vocal Abuse	Vocal Nodule		Total (no. Of cases)
	Present	Absent	
Present	24	38	69
Absent	2	176	178
Total	26	214	240
<i>Table 8: Association between Vocal Abuse and Vocal Nodule</i>			

Fisher's exact test was applied. Two tailed p value is 0.000. The association is found to be "significant"

Smoking & Alcohol	Ca Larynx / Hypopharynx		Percentage
	Present	Absent	
Present	42	97	139
Absent	12	89	101
Total	54	186	240
Table 9: Smoking and Alcohol (Ca Larynx / Hypopharynx)			

Fisher's exact test was applied. Two tailed p value is 0.000. The association is found to be "significant"

DISCUSSION

Majority of patients were seen in the age group of 30-60 years (61%) and most commonly in the 5th decade of life (22.6%). The age of patients ranged from 14 to 85 years. Thus, The incidence of hoarseness is most prevalent (61%) in the working class (30-60 years) and more common in the 4th decade of life (22.6%). Raizada et al⁴ reported 61.8% of their patients in the age group between 21-50 years and patients in 5th decade (28.18%) constituted the single largest group. Other studies by Deshmukh⁵ and Mehta⁶ also reported the incidence in the age group of 20-50 years to be 70.1% and 74.2% respectively. A male to female ratio of 2.3:1 was

observed in our study. Raizada et al⁴ and Karan Sharma et al⁷ also reported a male: female ratio of 2:1. This was also in confirmation to other studies.

Duration of hoarseness ranged from 2 hours to 8 years in our study, however 44.6% of cases had a duration between 1-6 months. In the study by Raizada et al⁴ duration ranged from 1 day to 5 years and 50% had duration in months. In the study of benign laryngeal lesions by Hegde et al⁸ duration ranged from 1 month to 2 years and mean duration was around 3 months. Apart from the symptom of change in voice (100%), the other common presentations were throat pain(63.6%), cough(42.1%), difficulty in swallowing(40%), foreign body sensation in throat(40%) and painful swallowing(33.8%) in descending order of frequency.

In our study, according to this perceptual evaluation, majority of the patients' disorder in voice came under moderate degree which could be comparable with the self-assessed VHI-10 score. Thus giving an idea of the extend of the disorder in patients' quality of life as well determining the urgency and need for management and provides a good prognostic evaluation post intervention. Our findings were comparable with the study by Bauer et al⁹.

In our study, organic/structural vocal pathology was identified in 95% of cases, while functional causes constituted 5% of cases, concurring with Agrawal et al¹⁰ whose study identified organic dysphonia in 95.2% and Parikh et al¹¹. However Lopes et al¹² found a higher prevalence of functional disorders. The measures used for laryngeal examination may be the reason behind such a difference since the use of continuous light videolaryngoscopy, as used in our study, is suitable for the

detection of organic lesions rather than functional lesions, which are better diagnosed using strobe light stroboscopy¹³.

In our study, the most common aetiological factor was found to be Chronic laryngitis (non-specific) comprising of 25.4% of cases. This was in accordance with the study conducted by Kataria¹⁴ et al, Baitha et al¹⁵ and Behera et al¹³ who found 20.55%, 21.81%, and 25% cases of chronic laryngitis respectively. We had 61 cases of which 42 (71.42%) patients had history of smoking. only 18 patients (29.5%) had septic foci as a sole etiology for their laryngitis. 40 patients had hoarseness lasting a few months and 21 had duration of few weeks. Another major predisposing factor was GERD (62.3%), tobacco/naso consumption (42.7%), allergic rhinitis with chronic mouth breathing (33.5%) which correlates with the study of Kataria¹⁴ et al who found association with tobacco consumption in 54% patients and GERD/LPR in 45.9% of patients. It was also observed in the study that in cases of laryngopharyngeal reflux (LPR) disease, the reflux related otolaryngologic symptoms (hoarseness, sore throat, globus, cough) were the most reliable symptoms. The increased frequency of LPR could be explained by the fact that sedentary habits, intake of junk food, stress etc. are making our life style prone for LPR. Proton pump inhibitors were of diagnostic as well as of therapeutic value in cases on LPR. (Bilgun et al.,)¹⁶

Acute laryngitis contributed to 7.1 % of the cases. This was in accordance with the findings of study conducted by Parajuli¹⁷ et al which showed 11.4% of acute laryngitis cases. Smoking(64.7%)Alcohol consumption(58.8%) and vocal

abuse(41.2%) were other factors found to be associated with acute laryngitis cases in this study.

There were 26 patients of vocal cord nodule and 100% were bilateral in accordance with Raizada et al⁴ and Mehta et al⁶ who also found 100% bilaterality in their studies. Our findings are in concurrence with Raizada et al⁴ and Kataria⁸ et al with 12.3% and 15.5% of vocal nodule cases in their studies respectively. Behera et al¹³ found vocal nodules in 15% cases. Banjara H et al¹⁸ found vocal nodules in 11.95% cases. Baitha et al¹⁵ found vocal nodules in 12.72% cases.

Apart from change in quality of voice (100%), patients also presented with symptoms of foreign body sensation, frequent clearing of throat, cough, voice fatigue as seen in studies by Baitha et al¹⁵ and Hegde al⁸. This group comprised of mainly teachers, vedic chanters and businessmen/vendors (65.4%) which comes under the Level III category of Kouffman and Isaacson¹⁹ classification followed by housewives (34.6%) which comes under Level IV of the Kouffman and Isaacson¹⁹ classification as found in the study conducted by Parajuli¹⁷ et al.

Smoking and concomitant alcoholism were found in 84% of patients who had carcinoma larynx unlike in other studies which also reflects the higher prevalence of these habits in our population. This was also probably the reason for higher incidence of cancer in our study as compared to other studies, Raizada et al⁴ (14.5%) and Parikh¹¹ (12%).

CONCLUSION

To conclude, with its vast etiology, dysphonia is often just the “tip of the iceberg” for a much greater underlying disease process and should therefore always be scrutinized in every patient. For treating doctors and health care workers in rural areas, the results of this study serve as a reminder as well as an insight into the possible differential diagnosis for dysphonia based on age and gender of the patient. The common aetiological factors found in our study are amenable to prevention by lifestyle modification, early detection by appropriate clinical and investigative measures, and suitable medical/surgical treatment.

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