

Causes of Hoarseness of Voice Based on Fiber Optic Laryngoscopy (FOL): Our Experiences in ENT OPD of a Peripheral Military Hospital

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Abstract

Introduction: This study was aimed to determine the common causes of hoarseness of voice in ENT OPD of a military hospital. **Materials and Methods:** This was an observational study carried out on 93 patients presented with hoarseness of voice in ENT OPD CMH Momenshahi, a peripheral military hospital, for a period of 2 years, from 1st April 2017 to 30th April 2019. Only Fiber Optic Laryngoscopy (FOL) findings were evaluated to diagnose the causes of hoarseness. Data were obtained from FOL findings documentation register. All data were analyzed using IBM SPSS version 25.0. Patients consent was taken. **Results:** Total 93 cases were studied irrespective of age and sex. Among them 34 (36.60%) were males and 59 (63.40%) were females. Commonly affected age group was 21-30 years. With a mean age of 33.34 years. Majority of the cases were housewife 44 (44.10%). The most common cause of hoarseness was Chronic Laryngitis 25 (26.9%). The other causes were vocal polyp 17 (18.30%), VC nodule 13 (14%), Incomplete Glottal closure 14 (18.30%), leukoplakia of VC 5 (5.40%) and Vocal cord palsy 3 (3.20%). Normal findings were found in 11 (11.80%) cases. **Conclusion:** Hoarseness is a common symptom of laryngeal dysfunction. Military personnel are frequently affected like general population. Common causes are almost same with a very few variations. FOL should be the basic tool to diagnose the causes of hoarseness.

Keywords: Hoarseness, Fiber Optic Laryngoscopy (FOL), Military personnel, Military hospital, Stroboscopy.

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Introduction:

Hoarseness of voice is the most common symptom of laryngeal disorder. Voice disorders afflict approximately 6% of children under 14 years of age, and 3-9% of the adult population¹. Fiber Optic Laryngoscopy (FOL) or Videolaryngoscopy, either with a rigid 70 or 90

degree Hopkins telescope allows an excellent view of the larynx through a transoral approach and produces a much higher optical resolution and higher sensitivity for detailed assessment of phonation². Broadly voice disorders are grouped into organic disorders and functional disorders. The commonest of them are organic disorders.

Organic lesions are associated with structural changes of the vocalization system which may be due to malformation, traumatic, inflammatory or infectious, and neoplastic etiologies³. In Functional dysphonia (aphonia/psychogenic dysphonia/hyper or hypo functional dysphonia) there is no significant organic changes that affect the vocal structures⁴. Neurologic dysphonia results from lesion in the central or peripheral nervous system that affect innervation and muscular control of the vocalization system^{3,4}. A significant number of military personnel and their families present with hoarseness of voice in military hospitals. No single study is available regarding the prevalence of various causes of hoarseness among the military personnel. In this study the FOL findings of vocal cords are used to find the causes of hoarseness of voice among the military personnel and their families in a peripheral military hospital.

Materials and Methods:

This was an observational study carried out on 93 patients presented with hoarseness of voice for more than 06 weeks of time in ENT OPD, Combined Military Hospital (CMH) Momenshahi, from 1st April 2017 to 30th April 2019, for a period of 2 years. CMH Momenshahi is a peripheral military hospital with limited facilities. After taking history and clinical examinations all patient were evaluated by Fiber Optic Laryngoscopy (FOL) and findings were documented in prescribed form. 70 degree Hopkins Rod (CARL STORZ) was used in every cases and all FOL procedure were done by same ENT specialist. In this study we included all the patients of

chronic hoarseness (> 06 weeks) irrespective of age and sex. We excluded the acute cases of hoarseness (< 06 weeks) and also the diagnosed cases who reported for review. We considered only the findings of FOL to diagnose the causes of hoarseness. In patient with hoarseness of voice with no visible obvious lesion, Stroboscopy is the best tool to study mucosal wave pattern of vocal cords. But as this facility was not available in our CMH we could not do it. The statistical analysis was done by using IBM SPSS version 25.0. Patients consent were taken. Ethical clearance was also approved.

Results:

Our total cases were 93 irrespective of age and sex. Among them 34 (36.60%) were males and 59 (63.40%) were females with a Male to Female ratio of 1 : 1.73 (Table-I).

Table-I: Sex distribution amongst study patients (n=93).

Sex	Frequency (n)	Percent
Male	34	36.6
Female	59	63.4
Total	93	100.0

Most of the patients were in the age group of 21–30 years 32 (34.40%) followed by 19 (20.40%) in 31-40 years age group. only 3 (3.20%) belong to the age group of <10 years. Mean age of the patient was 33.34 years (Table-II). Minimum age affected was 5 years and maximum age was 70 years.

Table-II: Age distribution of the study patients (n=93).

Age interval (years)	Frequency (n)	Percent
<10	3	3.2
11-20	15	16.1
21-30	32	34.4
31-40	19	20.4
41-50	6	6.5
51-60	9	9.7
61-70	8	8.6
>70	0	1.1
Total	93	100.0

Considering the occupation (Table-III) majority of the patients were housewife 44 (44.10%). 11 (11.80%) were teacher and Military personnel were 14 (15.10%).

Table-III: Distribution of relation between causes of hoarseness and occupation (n=93).

Disease	Occupation of participants					Total
	Military Service	Housewife	Teacher	Student	Others	
Normal	1	9	0	0	1	11
VC Polyp	3	6	3	2	3	17
VC nodule	0	2	7	4	0	13
Chronic Laryngitis	6	11	1	2	5	25
GORD	0	4	0	0	0	4
Leukoplakia VC	2	0	0	0	3	5
Incomplete glottal closure	2	8	0	4	1	15
VC palsy	0	1	0	0	2	3
Total	14	41	11	12	15	93
Percentage	15.10%	44.10%	11.80%	12.90%	16.10%	100%

Table-IV showed the causes of hoarseness as per gender distribution. The most common cause of hoarseness was Chronic Laryngitis 25 (26.9%) with a negligible male dominance (13/12). The second commonest cause was vocal polyp 17 (18.30%) with slight female dominance (9/8). Other causes were VC nodule 13 (14%) with female dominance (12/1), Incomplete Glottal closure 14 (18.30%), leukoplakia of VC 5 (5.40%) and Vocal cord palsy 3 (3.20%). Normal findings were found in 11 (11.80%) cases.

Table-IV: Distribution of causes of hoarseness among patients (n-93).

FOL findings	Male	Female	Frequency	Percent
Normal	2	9	11	11.8
VC Polyp	8	9	17	18.3
VC nodule	1	12	13	14.0
Chronic Laryngitis	13	12	25	26.9
GORD	0	4	4	4.3
Leukoplakia VC	5	0	5	5.4
Incomplete glottal closure	3	12	15	16.1
VC palsy	2	1	3	3.2
Total	34	59	93	100.0

Table-V: Distribution of incomplete glottal closure as a cause of hoarseness among different age groups.

	Cause of hoarseness among different age groups					Total
	Age interval					
	<10	11-20	21-30	31-40	41-50	
Male	1	2	0	0	0	3
Female	0	3	5	3	1	12
Total	1	5	5	3	1	15

Discussion:

Hoarseness of voice means a change in the quality voice. Basic mechanism of hoarseness are insufficient glottic closure during phonation, changes in the vocal fold stiffness and imbalance in mechanical properties between the two folds. Fiber Optic Laryngoscopy (FOL) is a very useful tool to detect various causes of hoarseness of voice. In addition Stroboscopy is the best tool to study mucosal wave pattern of vocal cord in patient of hoarseness of voice in whom no obvious lesion is seen. We just considered the FOL findings to find out the common causes of hoarseness of voice among military personnel and their families.

In our study, average age group was 21 –30 years (Table-II) which is similar to studies of Adegbiyi W.A et al⁵ and Nirupama Moran⁶ but in other studies average age group was between 4th and 6th decade^{7,8}. This difference may be due to the fact that military personnel are younger people who are physically more active and use their vocal skills more than other age groups. Male to female ratio was 1:1.70 in our study which differs from other studies^{5,6,7,8} where there was male dominance. No specific cause was found behind this observation.

High prevalence of hoarseness of voice were observed among housewives 41(41.10%), teachers 11(11.80%) and

also in military personnel 14(15.10%) in our study (Table-III). Hoarseness is known to be due excessive vocal use or abuse which is common with housewives, teachers, etc. This observations in our study are similar to other reports^{5,9}. In our study the most common cause of hoarseness was chronic laryngitis 25 (26.90%) which is similar to the study by Nirupama Moran⁶ (35.29%) and Baitha S et al¹¹ (43.63%). Adegbiji W.A et al⁵ and Dagli M, et al¹⁰ found acute laryngitis as the most common cause and chronic laryngitis as 2nd most common causes of hoarseness. It differs from our study as we excluded all acute causes of hoarseness.

In our study the second and third commonest causes of hoarseness were vocal cord polyp 17(18.30%) and vocal cord nodule 13(14%) respectively which are almost similar to other documented studies⁵⁻¹³.

Adegbiji W.A et al⁵ documented vocal nodules as the third commonest cause of hoarseness in their study. Munjal M et al⁷ found vocal nodule as their most common causes of hoarseness in 20% of cases. In their studies Ramesh kumar E et al⁸ and Ghosh et al¹³ showed vocal nodules as the most common cause. Banjara et al¹² also mentioned vocal nodule (11.95%) as the 2nd most common etiology. Female in the younger to middle age had maximum number of vocal nodules. Vocal abuse or misuse leading to phonotrauma considered to be the cause of vocal cord nodules. In our study vocal cord nodules (Table-IV) were also predominant in females (12 out of 13 cases) especially in housewives because their vocal abuse or misuse while dealing with their children in house. Sex distribution of vocal cord polyp was almost equal (8/9).

In our study we documented normal findings in 11(11.80%) cases. Munjal M et al.⁷ showed normal study in 27% of cases. Banjara et al¹² mentioned functional lesions (16.33%) to be most common etiology in their study. Adegbiji W. A et al⁵ in their study, showed all the patients with normal findings as secondary to psychogenic types. In functional dysphonia there is no organic abnormality in the patients. We also found the same in our study but we couldn't levelled those cases with normal finding as functional dysphonia because without stroboscopic findings it not possible for us to consider them as normal/functional dysphonia. Further evaluation is required in those cases.

Munjal M et al.⁷ showed 10% vocal cord palsy. Baitha¹¹ documented 9.09% vocal cord palsy. Banjara et al¹² mentioned vocal palsy (11.16%) but in our study only 3(3.20%) cases showed vocal cord palsy. We didn't find any specific cause behind this but our observation is that number of elderly age group patients, who are frequently develop vocal cord palsy, is less amongst military personnel. Vocal cord carcinoma or growth is also less due to the above reason in our study.

We observed incomplete glottic closure or phonatory gap in 15(16.10%) cases and mostly in female (13/15). Commonly affected age group is between 11-30 years (Table: V).

Glottal closure refers to the extent of vocal fold closure during the closed phase of phonation. Stroboscopic evaluation of the vocal folds is used to assess glottal configuration and closure during phonation. Gender & age, changes in pitch, loudness, vocal register, phonemic variations, and prosodic emphasis have an effect on glottal configuration during phonation^{14,15,16}. Most common glottal configuration are complete closure, posterior glottal chink, spindle shape, hourglass configuration, irregular closure, incomplete closure & anterior glottal chink^{15,17,18}. Casper et al. caution that in the absence of vocal fold pathologies, the difference between a normal larynx and one that is thought to be the cause of a voice disorder is indeed difficult to assess with use of stroboscopy alone¹⁹. A comparison of vocal fold closure in Rigid Telescopic and Flexible Fiberoptic Laryngostroboscopy showed that the estimated degree of incomplete closure was significantly higher during rigid telescopy than during flexible fiberscopy and the difference was especially evident in soft phonation. The degree of incomplete closure decreased significantly with increased loudness, regardless of method²⁰. Stroboscopic examination, which lacks in our study, is recommended for detail evaluation of glottal closure.

Conclusion:

Hoarseness of voice has a great impact on individual's personal and social life. For armed forces personnel who are always remain active and need special voice demand for their nature of duties, it is very important for them to be diagnosed as early as possible. Fiber Optic Laryngoscopy (FOL) facility should be available in every ENT OPD for early detection of various causes of hoarseness of voice.

Conflict of Interest: None.

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