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 (15.0%), 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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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                   | 3             | 9          | 0       | 0       | 1       | 11    |
| VC Polyp                 | 5             | 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 | Age interval                  | Total |
|-----------------------------------------------|--------------------------------|-------|
|                                              | <10                           | 1     |
|                                              | 11-20                         | 2     |
|                                              | 21-30                         | 3     |
|                                              | 31-40                         | 4     |
|                                              | 41-50                         | 5     |
|                                              | 51-60                         | 6     |
|                                              | 61-70                         | 7     |
|                                              | >70                           | 8     |
|                                              | Total                         | 35    |

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 Adegbiji W.A et al and Nirupama Moran where there was male dominance. Male to female ratio was 1:1.70 in our study which differs from other studies 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 reports3-9. 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 al8 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 al8 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 al9 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 al9 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 phonation14,15,16. Most common glottal configuration are complete closure, posterior glottal chink, spindle shape, hourglass configuration, irregular closure, incomplete closure & anterior glottal chink15,17,18. 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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