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VOCAL CORD PARALYSIS: WHAT MATTERS BETWEEN IDIOPATHIC AND NON-IDIOPATHIC CASES?

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ABSTRACT

Objective: To evaluate the clinical and demographic characteristics of patients with idiopathic and non-idiopathic vocal cord paralysis (VCP).

Study Design: Descriptive cross sectional study.

Place and Duration of Study: Department of ENT Combined Military Hospital Quetta and Rawalpindi, from 10 Dec 2012 to 31 Dec 2015.

Material and Methods: The study was a descriptive cross sectional study. The study was conducted after approval by the ethical committee. Patients with fixed vocal cords due to some growth of glottic region were enrolled. All the patients presenting with hoarseness of voice in ENT outpatient department CMH Quetta and Rawalpindi undergoing indirect laryngoscopy and the patients with vocal cord paralysis were selected. Informed written consent was taken and gender, age, name, hospital record number, address and phone number of each individual was noted. Every patient was evaluated by detailed history and thorough clinical examination. Patients were not investigated further if cause were revealed after some investigation. Follow-up of patients was done regularly in ENT OPD. CT scans/US neck was done by radiologist and FNAC/biopsy was reported by histopathologist. Data collected were recorded on proforma.

Results: In our study, out of 245 cases, 47.76% (n=117) were 16-40 years old and 52.24% (n=128) were 41-80 years, mean ± SD was calculated as 41.23 ± 11.25 years, 45.71% (n=112) male and 54.29% (n=133) were females. Frequency of causes of vocal cord paralysis was recorded as 15.92% (n=39) for idiopathic, 46.53% (n=114) had iatrogenic, 33.06% (n=81) had malignant neoplasm while 4.49% (n=11) had radiation.

Conclusion: Vocal cord paralysis is a common clinical condition with substantial morbidity. Awareness on the clinical characteristics and identification of the underlying etiology are keystones for foreseeing complications and determining the required therapeutic modality.

Keywords: Etiology, Iatrogenic, Idiopathic, Vocal cord paralysis.

INTRODUCTION

Vocal cord paralysis (VCP) can result from processes that alter normal function of recurrent laryngeal nerve or vagus nerve. Clinicians should know the vagus and recurrent laryngeal nerve tract and to recognize clinical characteristics[1]. It leads to a specific breathy voice which is associated with difficulty in swallowing, difficulty in breathing and cough[2]. This is a common neurogenic cause of hoarseness of voice. Normal voice can be restored if this paralysis is properly treated. Paralysis of one or both vocal cords occurs as a result of vagus nerve lesion[3].

Most important cause of VCP is iatrogenic injury linked to mediastinal and neck surgery. Surgery accounts for 50% of bilateral and 40% of unilateral vocal cord paralysis[4]. Other causes include malignant neoplasms 31% (tumor of the lung 7.4%, esophageal mass or tumors 9.5%, thyroid carcinomas 14.1%) and radiation 6%[5]. Surgical iatrogenic injury to the recurrent laryngeal nerve or vagus nerve is most common cause of unilateral voal cord paralysis. However,

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cause remains idiopathic in approximately 22% of cases[6].

If no etiology is identified then vocal cord paralysis is considered as idiopathic however the term "idiopathic" indicates that vocal cord paralysis is of unknown origin. The rate of unilateral idiopathic VCP is 2% to 41% and bilateral idiopathic cases is 3% to 13%[7].

Unilateral vocal cord paralysis needs treatment only if it causes dysphonia or risk of aspiration in patients with respiratory compromise. Surgery is required in case of significant weakness of voice for permanent or temporary medialization of vocal cords. The injection of teflon, fat, glycerine, collagen or silicon can be used for temporary medialization. The laryngeal framework surgery including medialization laryngoplasty (type 1 thyroplasty) is permanent method of medialization[8]. Anti-coagulant therapy or pulmonary and cardiac diseases are contraindications for surgical treatment[9].

An extensive protocol of investigations is required for diagnosis of vocal cord paralysis, including ultrasound, CT scan, or MRI of brainstem, neck and mediastinum[10].

Current study is conducted with the aim to evaluate clinical and demographic characteristics of patients with idiopathic and non-idiopathic vocal cord paralysis (VCP).

PATIENTS AND METHODS

The study was a descriptive cross sectional study. All cases of vocal cord paralysis presenting with hoarseness of voice of all age groups 16-80 years and of both genders were included. Patients with bilateral vocal cord paralysis were excluded.

Total of 245 patients were taken by using WHO sample size calculator, taking level of significance 5%, absolute precision 3%, anti-cipated population proportion 6% for a

Table-I: Frequency of causes of vocal cord paralysis (n=245).

Causes of Left vocal cord	No. of patients	Percentage (%)
Idiopathic	39	15.92
Iatrogenic	114	46.53
Malignant neoplasm	81	33.06
Radiation	11	4.49
Total	245	100

Table-II: Causes of vocal cord paralysis with regards to age.

Age (in years)	Idiopathic (n=39)	
	Yes	No
16-40	13	104
41-80	26	102
Age (in years)	**Iatrogenic (n=114)**	
	Yes	**No**
16-40	59	58
41-80	55	73
Age (in years)	**Malignant neoplasm (n=81)**	
	Yes	**No**
16-40	40	77
41-80	41	87
Age (in years)	**Radiation (n=11)**	
	Yes	**No**
16-40	5	112
41-80	6	122

confidence interval of 95%. Sample technique was non-probability consecutive sampling.

After taking approval by the ethical committee the study was conducted. All the patients presenting with hoarseness of voice in ENT outpatient department Combined Military Hospital, Quetta and CMH Rawalpindi undergoing indirect laryngoscopy and the patients with vocal cord paralysis were selected. Informed written consent was taken. Age, name, gender, hospital record number, serial number, address and phone number of each patient was recorded. Every patient was evaluated by detailed history and thorough clinical examination.

After selection, history and clinical examination, patients underwent following investigations to find out the cause of vocal cord paralysis:

- Chest X-ray PA view
- Barium swallow
- Ultrasound neck
- CT scan with contrast – base of skull to diaphragm
- Fine needle aspiration cytology (FNAC) if required
- Esophagoscopy under general anesthesia for any mass found and its histopathological studies.

Patients were not investigated further, if cause was revealed after some investigations. Follow-up of patients was done regularly fortnightly in ENT OPD. Principle investigator for performed all procedures and record all data of the patients enrolled in the study, whereas CT scan/US neck was done by radiologist and FNAC/biopsy was reported by histopathologist.

Data were analyzed by IBM (International Business Machine) SPSS version 21. Mean and standard deviation (SD) was used to describe results of quantitative data like age. Frequency and percentage was used to describe qualitative data like gender and causes of left vocal cord paralysis. Effect modifiers like age and gender was controlled by stratification. Post stratification chi-square test was applied, including level of significance at <0.05.

Table-III: Causes of left vocal cord paralysis with regards to gender.

Gender	**Idiopathic (n=39)**	
	Yes	**No**
Male	17	95
Female	22	111
Gender	**Iatrogenic (n=114)**	
	Yes	**No**
Male	48	64
Female	66	67
Gender	**Malignant neoplasm (n=81)**	
	Yes	**No**
Male	40	112
Female	41	133
Gender	**Radiation (n=11)**	
	Yes	**No**
Male	7	105
Female	4	129

RESULTS

Total 245 cases were enrolled who fulfilled the inclusion/exclusion criteria among the patients coming to Combined Military Hospital Quetta and CMH Rawalpindi. In this study, 47.76% (n=117) out of 245 cases, were 16-40 years

of age where as 52.24% (n=128) were 41-80 years, mean ± sd was calculated as 41.23 ± 11.25 years, 45.71% (n=112) male and 54.29% (n=133) were females.

Frequency of causes of vocal cord paralysis was recorded as 15.92% (n=39) for Idiopathic, 46.53% (n=114) had Itrogenic, 33.06% (n=81) had malignant neoplasm while 4.49% (n=11) had radiation (table-I).

Stratification for frequency of causes of vocal cord paralysis with regards to age and gender was calculated and presented in table-II and III.

DISCUSSION

Vocal cord paralysis can be result of mechanical or neurogenic fixation of cords. Sometimes VCP is symptom of underlying disease. Therefore it is very important to find out underlying cause. We planned the study with the view to evaluate the clinical and demographic characteristics of patients with idiopathic and non-idiopathic vocal cord paralysis (VCP). This may help to find out more common causes of vocal cord paralysis coming across local population and can be used for formulating strategies for diagnosis and management of their patients.

Our findings are in agreement with a study showing that common causes for paralysis of vocal cord were iatrogenic 48% (thyroid, radical neck and mediastinal surgeries) followed by malignant neoplasms (31%) and radiation (6%). Surgical injury of the recurrent laryngeal or vagus nerve is most common cause of unilateral vocal cord paralysis. However, cause remains idiopathic in number of cases (22%) significant[6].

Yumoto et al[11] reported surgery in 42.7%, malignancy in 22.4%, idiopathic in 17.4% and injuries of the neck in 2.2% of cases as unilateral paralysis vocal cord etiology. Rosenthal et al, stated surgery in 46.3%, malignancy in 13.5%, idiopathic in 17.6% and neck trauma in 2.2% of subjects as reason of unilateral vocal cord paralysis[12], these findings are slightly different with our study.

Malignant infiltration must be regarded as a potential cause of thickening or immobilization of the vocal cord. Laryngoscopy is useful for vocal cord focal lesions[4]. Contrast enhanced CT can be used to locate any pathology along the recurrent laryngeal and vagus nerves course, from the midbrain to the aortic arch[13]. MRI can be used to assess the medullary nuclei of vagus nerve[14].

In Dworkin study idiopathic vocal cord dysfunction was evaluated in 35 cases and 25% patients showed spontaneous improvement in long term[15].

CT Scan must be performed after idiopathic VCP is diagnosed, since 81% of these patients were found to have malignancies[16]. CT work-up is not required in patients with idiopathic paresis not paralysis[17].

However, different studies show different causes and then frequency, while in our population, these findings need further studies need to be conducted for validation of these observations.

CONCLUSION

Vocal cord paralysis is a common clinical condition with substantial morbidity. Awareness on the clinical characteristics and identification of the underlying etiology are keystones for foreseeing complications and determining the required therapeutic modality.

CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

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