

*Research Article***Voice Problems in Patients with Chronic Obstructive Pulmonary Disease****Haytham M. Mohamed, Effat A. Zaky, Zeinab K. Mahmoud and Nehal M. El-waddah**

Department of E.N.T, El-Minia Faculty of Medicine

Abstract

COPD can affect vocal quality and production, both directly, associated with respiratory decline, and indirectly, as a side effect of medication and associated with concurrent symptoms. The voice problems can vary between patients depending on co-morbidities, prescribed medications and severity of COPD. These findings could be attributed to irritation of the laryngeal mucosa, or formation of deposits due to inhalation of steroids or as an effect of changed glottal mechanism and laryngeal airflow. Moreover, smoking is a major risk factor for changes in the conformation of the vocal folds, producing mainly glottic edema. The voice problems can vary between COPD patients depending on the severity of smoking, prescribed medications, method used to administer medication and disease severity. It is recommended in this study to stop smoking, limit usage of steroid and generalize a routine voice examination for COPD patients.

Keywords: Voice Problems, Chronic Obstructive, Pulmonary Disease**Introduction**

“Voice” is the sound that the listener perceives when the adducted vocal folds are driven into vibration by the pulmonary air stream. Voice production is based on the coordination of three factors: breathing, phonation and resonance. The basic tone of the voice can be varied in many different ways, depending on the way in which we use the vocal folds and other parts of the voice mechanism. The main aspects of the voice that can be varied are: pitch, loudness and quality. Also there are other physical factors that affect voice production which are body posture and relaxation of the muscles of the body and the larynx (Jody et al., 2004).

Phonation, or voicing, is the product of vibrating vocal folds in the larynx; the vocal folds vibrate as air flows past them; the Bernoulli phenomenon and tissue elasticity help maintaining phonation. The Bernoulli principle states that given a constant volume flow of air or fluid, at a point of constriction there will be a decrease in air pressure perpendicular to the flow and increase in velocity of the flow. (Anthony et al., 2013).

The interaction of subglottal pressure, tissue elasticity, and constriction of the air flow caused by the vocal folds produces sustained

phonation as long as pressure, flow, and vocal fold approximation are maintained (Anthony et al, 2013).

Change of voice is a disorder characterized by altered vocal quality, pitch, loudness, or effort that impairs social and professional communication. It can deteriorate quality of life by affecting emotional, physical, social, and work function (Schwartz et al., 2009).

During normal tidal breathing, the upper airway provides 25-60% of overall respiratory resistance (Levitzky et al, 1995). The larynx is an important factor in the determination of the respiratory resistance, airflow volume, and the rate of breathing. Laryngeal resistance during breathing changes to meet ventilator needs. During inspiration for tidal (normal) breathing, the glottal opening is wide, providing low resistance. For tidal expiration, the vocal folds move slightly toward midline, and resistance increase marginally compared with inspiration (Brancatisano et al., 1991). Inspiratory resistance is typically lower than expiratory resistance (Savard et al., 1993).

Aim of the work

The aim of this work is to determine and analyze voice problems in patients of chronic

obstructive pulmonary disease in order to early detection and proper management.

Subjects and Methods

This cross-sectional prospective, case-control hospital based study was occurred in Minia University Hospital on the duration of the period between March 2017 and February 2018. This study was approved by the Ethics Committee for Research in the Faculty of Medicine, Minia University. The subjects were informed about the goal, procedure and disclosure of its results. After agreeing, they signed an informed. This study included 108 subjects who were recruited from inpatient and out -patient clinic and divided in to2 groups: **Group 1** includes 52 patients diagnosed as chronic obstructive pulmonary disease (COPD); Patients were referred to our

Phoniatrics unit from chest clinic El-Minia University hospital and El-Minia chest hospital **Group2** (control group) consists of 56 normal individuals; they were collected randomly from members not suffering of COPD (relatives of patients). Both of the study and control group will be statistically matched in all comparative data.

As regard group 1 (patients with COPD) patients were known diagnosed COPD patients by history, physical examination and spirometry with age ranged from 51-68 years old.

We exclude patients with:

- History of voice abuse and misuse
- Neurological problems affecting voice production
- Professional voice users.

Results

Table (1): Sociodemographic data in case G1 and control G2 group:

Socio-demographic characteristics	Cases N=52	Control N=56	P- value
Age (years)	59.48 ± 8.30	59.23 ± 9.66	0.14(106) 0.8
Sex			
Male	49 (94.2%)	48 (85.7%)	2.13 (1)
Female	3 (5.8%)	8 (14.3%)	0.2
Smoking status			
Positive	26 (50%)	27 (48.2%)	4.10 (2)
Negative	5 (9.6%)	13(23.2%)	0.1
Ex smoker	21 (40.4%)	16 (28.6%)	

- Non- significant (P≥0.05), significant (p< 0.05), -highly significant (p< 0.001).

Discussion

A voice disorder said to exist when a person’s quality, pitch and loudness of voice differ from those persons of similar age, sex, cultural background and geographical locations (Jardim et al., 2007).

Voice problems in chronic obstructive pulmonary disease (COPD) patients were rarely investigated and increased attention was given to the assessment and treatment of the respiratory problem. These respiratory conditions are known to cause adverse effects

on voice, which might further affect the quality of life of an individual(Cassiani et al., 2013). COPD can affect vocal quality and production, both directly, associated with respiratory decline, and indirectly, as a side effect of medication and associated with concurrent symptoms (Shastry et al., 2014).

The voice problems can vary between patients depending on co-morbidities, prescribed medications and severity of COPD. These findings could be attributed to irritation of the laryngeal mucosa, or formation of deposits due

to inhalation of steroids or as an effect of changed glottal mechanism and laryngeal airflow. Moreover, smoking is a major risk factor for changes in the conformation of the vocal folds, producing mainly glottic edema (Saeed et al., 2018).

Voice problems in chronic obstructive pulmonary disease (COPD) and bronchial asthma patients were seldom investigated and increased attention was given to the assessment and treatment of the respiratory problem. These respiratory conditions are known to cause adverse effects on voice, which might further affect the quality of life of an individual.

Conclusion & Recommendation

COPD can affect vocal quality and production, both directly, associated with respiratory decline, and indirectly, as a side effect of medication and associated with concurrent symptoms.

The voice problems can vary between patients depending on co-morbidities, prescribed medications and severity of COPD. These findings could be attributed to irritation of the laryngeal mucosa, or formation of deposits due to inhalation of steroids or as an effect of changed glottal mechanism and laryngeal airflow. Moreover, smoking is a major risk factor for changes in the conformation of the vocal folds, producing mainly glottic edema.

The voice problems can vary between COPD patients depending on the severity of smoking, prescribed medications, method used to administer medication and disease severity.

It is recommended in this study to stop smoking, limit usage of steroid and generalize a routine voice examination for COPD patients.

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