ABSTRACT

Objective: To investigate phonatory symptoms and acoustic and aerodynamic findings in patients with chronic obstructive lung disease (COPD) compared to a control group.

Subjects and Methods: A total of 40 subjects, 27 COPD and 13 control subjects matched according to age and gender were enrolled in this study. All subjects were asked about the presence or absence of dysphonia, degree of vocal fatigue and phonatory effort. Perceptual evaluation, acoustic analysis and aerodynamic measurements were also performed. Patient’s self assessment using the Voice Handicap Index 10 was reported.

Results: There was a statistically significant difference in the prevalence of dysphonia between the two groups (12% vs. 0%, %, p value <0.05) with a significant difference in the mean score of respiratory effort and vocal fatigue (p values 0.011, 0.012 respectively). There was no significant difference in any of the perceptual parameters between the two groups except for roughness (p value 0.009). There was no significant difference in the means of any of the acoustic parameters between patients and controls. There was also no significant difference in the Maximum phonation time between the two groups (p value 0.916).

Conclusion: Dysphonia is significantly more prevalent in patients with COPD compared to controls.

METHODS AND MATERIALS

40 subjects were included in the study, 27 patients with COPD and 13 controls were matched to age and gender.

Subjects with a recent history of upper respiratory tract infection, vocal fold lesions and or laryngeal manipulation were excluded from the study.

Demographic data included age, gender, intake of steroid inhalers, history of smoking and history of allergy. Allergic rhinitis was evaluated using a standardized validated questionnaire. In view of their confounding effect, the prevalence of allergy and smoking were similar between patients and controls.

All subjects were asked about the presence or absence of dysphonia, degree of vocal fatigue and phonatory effort (0-3).

All patients underwent acoustic analysis using VISI-PITCH IV by Kay Pentax.

The aerodynamic measurements included the Vital Capacity, FEV1, FEV1/FVC, maximum phonation time MPT, and the phonatory quotient PQ.

INTRODUCTION

- Chronic Obstructive Lung Disease (COPD) is the fourth leading cause of mortality in the United States. It is a mixture of disease processes, namely emphysema and obstructive bronchitis, characterized by airflow limitation during respiration.

- Vocal symptoms and phonatory changes in patients with COPD have not been previously reported. Despite the fact that breathing is a major component to phonation, the impact of COPD on voice in patients with COPD has not been investigated.

- The purpose of this study is to examine the prevalence of vocal symptoms and analyze the acoustic findings and airflow measurements in patients with COPD compared to a control group matched according to age and gender.

RESULTS

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<th>Table 1: Demographics</th>
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<td>Females</td>
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<td>Emphysema Bronchitis</td>
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Graph 1: Comparison of GRABS analysis between patients and controls.

Graph 2: Comparison of phonatory symptoms between patients and controls.

DISCUSSION

The results of this investigation clearly indicate a higher prevalence of phonatory symptoms in patients with COPD compared to controls. There was also a significant difference in the subjective evaluation of the vocal signal in patients with COPD vs. controls.

Postulated mechanisms:

- In patients with chronic bronchitis, the chronic inflammation in addition to mucus thickening result in narrowing of the small airways, thus increasing the resistance to airflow. In patients with emphysema, the pathology involves destruction and collapse of the alveoli, leading to a decrease in the elastic recoil and an increase in lung compliance. This air entrapment and limitation in expiration affects breathing support which is cardinal to phonation.

- A second plausible explanation is the higher respiratory rate in patients with COPD. A study by Sivasankar and Erickson on the effect of accelerated breathing on voice has shown that even short term accelerated oral breathing may have a detrimental effect on phonation, namely an increase in the phonatory threshold pressure.

- The use of steroid inhalers is known to be a hazard to voice with many reports in the literature on phonatory symptoms and laryngeal findings attributed to the inhaled corticosteroids.

CONCLUSIONS

- The results of this study indicate that dysphonia is significantly more prevalent in patients with COPD compared to controls.

- Affected individuals need to exert more effort to talk and experience vocal fatigue more commonly than non-affected ones.

REFERENCES