

USE OF INHALED AND ORAL CORTICOSTEROIDS FOR ACUTE DYSPHONIA

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ABSTRACT

Acute dysphonia associated with laryngitis often leads patients to seek medical attention. Despite being a common disease, its treatment is not well established in literature. Corticosteroid therapy is the main pharmacological treatment described, but the existing studies are not able to determine the superiority between them.

The aim of this study was to evaluate and compare the effect of inhaled corticosteroid (fluticasone) and the effect of oral corticosteroid (prednisolone) in patients with dysphonia associated with laryngitis.

Two groups of 25 patients were evaluated by videolaryngostroboscopy, perceptive and acoustic voice analysis and questionnaire, before and after use of 2 medications. The first group received inhaled fluticasone and the second group oral prednisolone, both for 7 days.

There was significant improvement of laryngitis and voice in all patients studied after 7 days. Patients who used inhaled corticosteroid, presented more significant edema reduction and reported collateral effects were less frequent.

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INTRODUCTION

Acute dysphonia related to oral communication disorder and daily activities limitation is a common reason for seeking medical attention. Laryngitis, an inflammation of the larynx characterized by edema and/or hyperemia of larynx, is the most frequent clinical finding in these patients¹. Voice resting is a basic treatment for acute dysphonia but it is not possible for the majority of these patients² therefore other treatments options are needed.

Corticosteroid therapy is the main drug treatment described for acute laryngitis. Systemic corticosteroids have a potent anti-inflammatory effect and its indication for inflammatory diseases and edema of the larynx is well known^(3,4,5,6,7,8).

Inhaled corticosteroids are the treatment of choice for airway disorders such as rhinitis and asthma as it act directly on the inflamed area and may be used in lower doses. For short period treatments, they have fewer collateral effects and are safer than systemic corticosteroids^(9,10). They are indicated for use in children with croup and in cases of post endotracheal extubation⁹. There are, however, no studies on their use in acute laryngitis in adults. Probably this is consequence of reports of dysphonia associated of laryngeal lesions in asthmatic patients after chronic use of inhaled medications^(11,12,13,14,15). These laryngeal alterations, however, are not described in short period treatments (less than 2 weeks) and in low doses.

This clinical trial study aims at evaluating and comparing the effect of inhaled (fluticasone) and oral corticosteroid (prednisolone) in patients with acute dysphonia associated to laryngitis.

METHODS AND MATERIALS

Two groups of 25 adult patients were evaluated before and after 2 treatments. The first group received inhaled fluticasone 50mcg, twice a day, and the second group received oral prednisolone, 20 mg, twice a day, both treatments for 7 days.

Prednisolone is the main corticosteroid recommended in studies for laryngitis in adults and it was selected because of its safety. The 40 mg daily dose is the mean recommended dosage of reference studies^(4,5,7). Fluticasone was selected for its high potency and poor systemic absorption characteristics¹⁰. The dose of 100 mcg/day is the smallest effective dose described.

The following items were evaluated: hyperemia, edema and vocal fold vibration by videolaryngostroboscopy, global voice grading, roughness, breathiness, asthenia and strain in perceptive analysis (GRBAS scale), maximum phonation time, fundamental frequency, jitter, shimmer, harmonic to noise ratio and neutralized noise energy in acoustic analysis (Dr Speech Voice Analysis program). The day of voice improvement and drugs side effects are evaluated by a questionnaire. Analysis were performed blinded by two ENT specialists and three speech therapists. This clinical study was approved by the Ethics Committee for studies on Human Subjects of the Santa Casa de São Paulo.

RESULTS

Significant reduction of hyperemia, edema, and improvement in vocal fold vibration were observed by videolaryngostroboscopy in all patients of both groups after the 7 days (figure 1 and 2).

The perceptive voice analysis showed significant improvement in global voice grading, roughness and breathiness, in both groups. The strain did not vary significantly and asthenia was not detected in any patient in this study.

Acoustic analysis showed a significant improvement in shimmer and neutralized noise energy in patients who used prednisolone. Patients who used fluticasone showed a significant improvement in maximum phonation time, jitter and neutralized noise energy.

More than 70% of patients related normal voice by the third day of treatment in both groups, and all studied patients related normal voice by the fifth day. There was no statistic difference in this time between the studied groups.

In this study sample, seven patients (14%) using oral corticosteroid reported side effects (heartburn, stomach pain and nausea) and one patient (2%) who used inhaled corticosteroid related desire to cough.

Collateral effects were less frequent in fluticasone group.

The final comparison between the two groups showed statistically significant difference in edema reduction (p=0.011) in patients who used fluticasone (table 1).



Figure 1. videolaryngoscopic image before and after oral prednisolone



Figure 2. videolaryngoscopic image before and after inhaled fluticasone

Table 1: Comparison of the variables in both groups after treatment Videolaryngostroboscopic, perceptive and acoustic voice analysis

| variable | Hyperemia | Edema | Vocal fold vibration | Global voice grading (GRBAS) | Roughness (GRBAS) | Breathiness (GRBAS) | Strain (GRBAS) | Maximum phonation time (s) | Mean Fundamental frequency (Hz) | Jitter (%) | Shimmer (%) | Harmonic to noise ratio (dB) | Neutralized noise energy (dB) |
|----------------|-----------|--------------|----------------------|------------------------------|-------------------|---------------------|----------------|----------------------------|---------------------------------|------------|-------------|------------------------------|-------------------------------|
| P-value | 0,771 | 0,011 | 0,258 | 1,000 | 1,000 | 0,400 | 1,000 | 0,898 | 0,473 | 0,304 | 0,399 | 0,327 | 0,222 |

DISCUSSION

- Systemic corticosteroids effectiveness in the inflammatory processes of the larynx is known and has been described by some authors^(4,5,6,7,8).

- Significant edema reduction in inhaled corticosteroid group may be explained by the direct action of the drug in the site of inflammation. Pedersen et al, 1997 and Mocelin et al, 2002 reported this same effect in the lower airways in asthmatic patients.

- The improvement in the quality of the voice, roughness and breathiness, detected by the perceptive analysis of voice, was expected after reduction of inflammation and correlates with videolaryngostroboscopy findings.

- The best results of acoustic measurements recorded in the group treated with inhaled fluticasone can be explained by the best reduction of edema observed in this group.

- The improvement of voice reported by all patients in both groups by the 5th day, makes us think about the duration of treatment: 5 days would be enough?

- Mocelin et al, (2002) and Roland et al (2005) reported that the side effects of inhaled corticosteroids in short period treatment are less frequent and smaller in relation to systemic corticosteroids, which were also observed in this study.

- Laryngeal disorders described for asthmatic patients in chronic use of inhaled corticosteroids^(11,12,13,14,15) were not observed in any patient in our study. We believe, as reported by Watts, 2002, that these changes did not occur during treatment with inhaled corticosteroids when used in low doses, few times a day and for a short period of time.

CONCLUSIONS

Patients who used inhaled corticosteroid had greater reduction in larynx edema and reported fewer side effects than the patients who used oral corticosteroid in this study. The results of other analysis were performed similar in both groups.

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