Modulation of Inflammatory and Pro-Fibrotic Signaling in a Rabbit Model of Acute Phonotrauma Using Triamcinolone

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Abstract

OBJECTIVES: To investigate the hypothesis that triamcinolone acetate vocal fold inflammatory and pro-fibrotic signaling during acute phonotrauma is attenuated from raised intensity phonation in a rabbit model. METHODS: Twenty rabbits were randomly assigned to receive no intervention, 30 minutes of raised intensity phonation, bilateral injection of triamcinolone acetate, or sham injection. Quantitative polymerase chain reaction (qPCR) was used to investigate gene expression levels of COX-2, IL-1β, and TGF-β. RESULTS: Results of qPCR revealed a significant increase in COX-2 gene expression between the raised intensity phonation and non-phonated control groups (P=0.007). IL-1β gene expression was significantly different across groups (P=0.003) (Figure 1). No significant differences in TGF-β expression from raised intensity phonation, although the overall main effect from ANOVA was non-significant (P=0.134). CONCLUSIONS: Results of the present experiment revealed a significant increase in COX-2 gene expression during acute phonotrauma. Injectable corticosteroids including Kenalog (triamcinolone acetonide) were able to attenuate the increase in COX-2 gene expression from raised intensity phonation, although the overall main effect from ANOVA was not statistically significant (P=0.090). Materials and Methods

Materials and Methods

Statistics

Voice disorders affect approximately 3-9% of the population at any given time. Non-anatomical factors without an obvious relationship to vocal fold trauma are thought to play an important role in the development of voice disorders. Here, we report the findings of a cross-sectional study investigating the effects of phonotrauma on inflammation and protein expression. RESULTS: Data from ANOVA revealed significant differences in IL-1β expression across groups (P=0.003) (Figure 1). No significant differences in TGF-β expression from raised intensity phonation, although the overall main effect from ANOVA was non-significant (P=0.134). Future Directions

Inflammatory Response

Materials and Methods

Treatments


References


Acknowledgements

Approved by the Institutional Animal Care and Use Committee of Vanderbilt University Medical Center.

Statistical power was computed and the study was powered to 80% a priori power (β=.20). Power was based on a number of observations for t-Test of differences between control and stimulated phonated and control groups using an adjusted P-value of 0.0167 to control for false discovery. Materials and Methods

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