



ORIGINAL ARTICLE

## Impact of adenotonsillectomy on vocal emission in children ☆,☆☆



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### KEYWORDS

Voice;  
Tonsillectomy;  
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Pharyngeal tonsil;  
Palatine tonsil

### Abstract

**Introduction:** Adenotonsillectomy is the most common surgery performed by otolaryngologists in pediatric age, and one of the most frequently asked questions about the postoperative period is whether there is a potential for change in vocal pattern of these children.

**Objective:** To evaluate the impact of adenotonsillectomy in the voice emission pattern of children with hypertrophy of palatine and pharyngeal tonsils.

**Methods:** This is a prospective study in which we carried out perceptual auditory assessments and acoustic analysis of 26 children with adenotonsillar hypertrophy at three time points: before surgery, one month and three months after surgery. The following acoustic parameters were estimated using the Praat software: fundamental frequency, jitter, shimmer, and harmonic–noise ratio.

**Results:** A statistically significant change was found between shimmer and harmonic–noise ratio during vowel /u/ production between the preoperative and 1st month postoperative time points. No significant differences were detected for acoustic parameters between preoperative analysis and that of the 3rd month post-operation.

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## PALAVRAS CHAVE

Voz;  
Tonsilectomia;  
Adenoidectomia;  
Tonsila faríngea;  
Tonsila palatina

**Conclusion:** Transient changes in acoustic parameters occur in children with adenotonsillar hypertrophy submitted to adenotonsillectomy, progressing to normalization in the 3rd post-operative month.

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## Impacto da adenotonsilectomia na emissão vocal em crianças

### Resumo

**Introdução:** Adenotonsilectomia é o procedimento cirúrgico mais realizado pelos otorrinolaringologistas em pacientes pediátricos, e entre as dúvidas mais frequentes a respeito do pós-operatório, inclui-se a possibilidade de modificações no padrão vocal dessas crianças.

**Objetivo:** Avaliar o impacto da adenotonsilectomia no padrão de emissão vocal de crianças com hipertrofia de tonsilas palatinas e faríngea.

**Método:** Trata-se de estudo prospectivo, em que foram realizadas a avaliação perceptiva-auditiva e a análise acústica da voz de 26 crianças com hipertrofia adenotonsilar em três oportunidades: no pré-operatório e no 1° e 3° meses após o procedimento cirúrgico. Os parâmetros acústicos frequência fundamental, jitter, shimmer e proporção harmônico-ruído foram avaliados por meio do programa Praat.

**Resultados:** Houve uma alteração estatisticamente significativa entre o shimmer e a proporção harmônico-ruído da emissão da vogal/u/entre o período pré-operatório e o 1° mês do pós-operatório. Não houve diferenças significantes dos parâmetros acústicos entre a análise pré-operatória e aquela realizada no 3° mês do pós-operatório.

**Conclusão:** Crianças com hipertrofia adenotonsilar submetidas à adenotonsilectomia cursam com alterações transitórias dos parâmetros acústicos, evoluindo com a normalização dos mesmos no 3° mês do pós-operatório.

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## Introduction

The voice is basically a product of three physiological processes: a constant expiratory airflow controlled by chest muscles; production of glottal sound through vibration of the vocal folds, and a change in this sound with amplification and muffling of sound frequencies resulting from the action of pharyngeal, oral and nasal resonant structures (vocal tract).<sup>1</sup>

Adenotonsillectomy is the most common surgery performed by otolaryngologists, especially in children. Among the most frequently voiced concerns regarding this procedure are questions about changes in vocal patterns after surgery and whether they are temporary or permanent.

According to Mora et al., hypertrophic palatine tonsils reduce the oropharyngeal air space and push the tongue forward, causing mouth breathing, abnormal nasality and a muffled voice.<sup>2</sup> It is also reported that adenoid and tonsil hypertrophy cause obstruction of the nasopharyngeal region and a decreased mobility of velopharyngeal muscles (*i.e.* soft palate).<sup>2</sup>

Although it is the most studied, nasality is not the only form of voice alteration that can occur after adenotonsillectomy. With vocal tract modification, there can be changes in voice quality due to phonation instability, as a consequence of changes in the vibration pattern of the vocal folds.<sup>2,3</sup>

However, to date, few studies have assessed vocal emission after adenotonsillectomy, and most of these did so using only subjective measures (perceptual-auditory voice analysis).

The aim of this study is to assess the impact of adenotonsillectomy on the pattern of vocal emission of children with hypertrophy of palatine and pharyngeal tonsils.

## Methods

This is a prospective study with surgical intervention and postoperative monitoring, which began in January 2009 and ended in December of the same year. Twenty-six children, between 5 and 10 years of age, suffering from palatine and pharyngeal tonsil hypertrophy and with prior indication for adenotonsillectomy, were monitored.

This study was approved by CEP, according to Resolution 196/96 of the National Ethics in Research Committee – CONEP, dealing with guidelines and regulatory standards for research involving human subjects.

Our children were submitted to otorhinological examination, which consisted in a detailed history, physical examination, and transnasal fiberoptic laryngoscopy.

The inclusion criteria for this study were: palatine tonsil hypertrophy grades III or IV, according to the scale

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