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ORIGINAL ARTICLE

Tracheostomy in children: a ten-year experience from a tertiary center in southern Brazil ☆,☆☆

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KEYWORDS

Tracheostomy;  
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Abstract

**Introduction:** Children may require tracheostomy due to many different health conditions. Over the last 40 years, indications of tracheostomy have endorsed substantial modifications.

**Objective:** To evaluate pediatric patients warranted tracheostomy at our Hospital, in regard to their indications, associated comorbidities, complications and decannulation rates.

**Methods:** Retrospective study concerning patients under 18 years of age undergoing tracheostomy in a tertiary health care center, from January 2006 to November 2015.

**Results:** One hundred and twenty-three children required a tracheostomy after ENT evaluation during the study period. A proportion of 63% was male, and 56% was under one year of age. Glossoptosis was the most common indication (30%), followed by subglottic stenosis (16%) and pharyngomalacia (11%). The mortality rate was 31%. By the end of this review, 35 children (28.4%) had been decannulated, and the fewer the number of comorbidities, the greater the decannulation rate ( $0.77 \pm 0.84$  vs.  $1.7 \pm 1.00$  comorbidities;  $p < 0.001$ ).

**Conclusion:** Tracheostomy in children is a relatively frequent procedure at our hospital. The most common indications are glossoptosis and subglottic stenosis. A high mortality rate was found, potentially substantiated by the high number of critical care patients with chronic neurological conditions in this cohort. Our decannulation rate is slightly below other series, probably because of the greater amount of patients with comorbidities.

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☆☆ This study was performed in the Otolaryngology Unit of Hospital de Clínicas de Porto Alegre.

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**PALAVRAS-CHAVE**

Traqueostomia;  
Criança;  
Epidemiologia

**Traqueostomia em crianças: uma experiência de dez anos em um centro terciário do sul do Brasil****Resumo**

**Introdução:** As crianças podem necessitar de traqueostomia devido a diferentes problemas de saúde. Ao longo dos últimos 40 anos, as indicações de traqueostomia passaram por mudanças substanciais.

**Objetivo:** Avaliar pacientes pediátricos com traqueostomia no nosso Hospital, no que diz respeito às suas indicações, comorbidades associadas, complicações e taxas de decanulação.

**Método:** Estudo retrospectivo de pacientes com menos de 18 anos de idade submetidos a traqueostomia em um centro de saúde terciário, de janeiro de 2006 a novembro de 2015.

**Resultados:** Cento e vinte e três crianças precisaram de uma traqueostomia após avaliação otorrinolaringológica durante o período do estudo. Do total, 63% era do sexo masculino e 56%, menor de um ano de idade. Glossoptose foi a indicação mais comum (30%), seguida por estenose subglótica (16%) e faringomalácia (11%). A taxa de mortalidade foi de 31%. Até o final deste, 35 crianças (28,4%) haviam sido decanuladas, e quanto menor o número de comorbidades, maior foi a taxa de decanulação ( $0,77 \pm 0,84$  vs.  $1,7 \pm 1,00$  comorbidades;  $p < 0,001$ ).

**Conclusão:** A traqueostomia em crianças é um procedimento relativamente frequente em nosso hospital. As indicações mais comuns são glossoptose e estenose subglótica. Uma alta taxa de mortalidade foi encontrada, potencialmente comprovada pelo elevado número de pacientes críticos com condições neurológicas crônicas nessa coorte. Nossa taxa de decanulação está ligeiramente abaixo de outras séries, provavelmente por causa da maior quantidade de pacientes com comorbidades.

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**Introduction**

Tracheostomy is one of the oldest and most commonly performed surgical procedures among critically ill patients. Children require tracheostomy for many different reasons, and those with a chronic tracheostomy constitute an important subgroup of children who are at risk for airway compromise.

Although a life saving surgery, tracheostomy in children is more challenging when compared to those performed in adults, and it is associated with higher rates of morbidity and mortality. Overmore, the risk of complications increases with age among pediatric patients.<sup>1,2</sup>

Over the last 40 years, there has been a transition in tracheostomy indications. During 1970s, the main indication of tracheostomy was upper airway obstruction secondary to an acute inflammatory disease such as epiglottitis, croup or laringotracheitis.<sup>2</sup> With the introduction of vaccines against *Haemophilus influenzae* and *Corynebacterium diphtheriae* and the adoption of routine use of endotracheal intubation as an alternative to tracheostomy, there was a decline in such indications.

On the other hand, the improvement of support care and therapeutics in premature infants and children with congenital anomalies increased the survival rates of these children, which often required protracted periods of endotracheal intubation and mechanical ventilation. Children with endotracheal intubation may need mechanical ventilation for conditions such as pulmonary and cardiac malformations, chronic pulmonary insufficiency, neurological disorders and

cervical trauma. In the other hand, craniofacial malformations and anatomical/functional changes of the larynx, such as subglottic stenosis, tracheomalacia and tumors, are among the obstructive causes.<sup>3</sup>

A recent study from a Scotland tertiary center<sup>3</sup> found long-term ventilation as the main indication for tracheostomy in their series of 111 children and cited some articles from United Kingdom hospitals with similar findings. However, a study in New Zealand<sup>4</sup> included 122 patients undergoing tracheostomies between 1987 and 2003 and found that the obstruction of upper airway was the indication in 70% of the patients. More recently, an American study published in March, 2013,<sup>5</sup> which reviewed data from 158 patients, raised the hypothesis that indications of tracheotomy would be changing again, with a reduction of indications for prolonged endotracheal intubation and an increase in the group of craniofacial anomalies and upper airway obstruction.

Thus, our objective is to evaluate children who warranted tracheostomy at our Hospital, in regard to their indications, associated comorbidities, complications and decannulation rates.

**Materials and methods**

This is a retrospective study of all tracheostomies performed in children by the ENT Unit of our Hospital between January 2006 and November 2015. Our Hospital is a tertiary referral center at Southern Brazil, which receives high complexity patients such as pediatric airway disorders.

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