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ORIGINAL ARTICLE

Incidence and endoscopic characteristics of acute laryngeal lesions in children undergoing endotracheal intubation☆

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KEYWORDS
Intubation;
Laryngeal diseases;
Laryngoscopy;
Artificial respiration

Abstract
Introduction: Acute laryngeal lesions after intubation appear to be precursors of chronic lesions.
Objective: To describe the incidence and type of acute laryngeal lesions after extubation in a pediatric intensive care unit (PICU).
Methods: A cohort study involving children from birth to <5 years, submitted to intubation for more than 24 h in the PICU of an university hospital. In the first eight hours after extubation, a flexible fiberoptic laryngoscopy (FFL) was performed at the bedside. Those with moderate to severe abnormalities underwent a second examination seven to ten days later.
Results: 177 patients were included, with a median age of 2.46 months. The mean intubation time was 8.19 days. Seventy-three (41.2%) patients had moderate or severe alterations at the FFL, with the remaining showing only minor alterations or normal results. During follow-up, 16 children from the group with moderate to severe lesions developed subglottic stenosis. One patient from the normal FFL group had subglottic stenosis, resulting in an incidence of 9.6% of chronic lesions.

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Conclusion: Most children in the study developed mild acute laryngeal lesions caused by endotracheal intubation, which improved in a few days after extubation.

PALAVRAS-CHAVE
Intubação;
Doenças da laringe;
Laringoscopia;
Respiração artificial

Incidência e características endoscópicas de lesões agudas laríngeas em crianças submetidas à intubação endotraqueal

Resumo
Introdução: As lesões laríngeas agudas após a intubação parecem ser precursoras das lesões crônicas.
Objetivo: Descrever a incidência e o tipo de lesões laríngeas agudas após extubação em Unidade de Terapia Intensiva Pediátrica (UTIP).
Método: Estudo de coorte envolvendo crianças de 0 a 5 anos incompletos, com intubação por mais de 24 horas na UTIP de um hospital universitário. Nas primeiras 8 horas após extubação, uma nasofibrolaringoscopia à beira do leito foi realizada. Aqueles com anormalidades moderadas a graves foram submetidos a novo exame entre 7–10 dias após.
Resultados: 177 pacientes foram incluídos, com idade mediana de 2,46 meses. O tempo médio de intubação foi de 8,19 dias. Setenta e três (41,2%) pacientes apresentaram alterações moderadas ou graves à laringoscopia, o restante mostrando apenas alterações leves ou exame normal. Durante o acompanhamento, 16 crianças do grupo lesões moderada a grave desenvolveram estenose subglótica. Um paciente do grupo laringoscopia normal teve estenose subglótica, somando-se uma incidência de 9,6% de lesões crônicas.
Conclusão: A maioria das crianças do estudo desenvolveu lesões laríngeas agudas leves decorrentes da intubação endotraqueal, com melhora em alguns dias após a extubação.

Introduction

It is estimated that one in three patients admitted to a pediatric intensive care unit (PICU) will require endotracheal intubation for an average of five days.[1]

The endotracheal tube exerts pressure on the mucosa of the posterior aspect of the larynx; the resulting ischemia seems to be the starting point for the development of post-intubation acute laryngeal lesions. The lesions occur at the points of greatest contact with the tube: medial surface of the arytenoid cartilage, medial portion of cricoarytenoid joint and vocal process, posterior glottis in the interarytenoid region, and subglottis involving the inner surface of the cricoid cartilage, usually the posterior portion.[2-4]

There are several classifications for acute lesions secondary to intubation. According to Lindholm, the lesions can be classified from grades I to IV, depending on severity.[5] According to Benjamin, acute laryngeal lesions are divided into five groups: early nonspecific alterations, edema, granulation tissue, ulceration, and miscellaneous.[3] Fan et al. classified the findings as normal or mild (interarytenoid region ulceration, vocal fold granuloma), moderate (pseudomembranes, bulky granulomas) and severe lesions (subglottic stenosis, subglottic membrane, tracheal stenosis, vocal fold paralysis).[6] Colice et al. classified the findings as normal, mild (erythema or mucosal ulceration without lumen size reduction during inspiration), moderate (erythema, ulceration, and mucosal edema, reducing laryngeal lumen during inspiration) and severe lesions (erythema, ulceration, and mucosal edema reducing laryngeal lumen by more than 50% during inspiration).[7] This lack of homogeneity in classifications makes it difficult to compare the studies.

The incidence of subglottic stenosis (SGS) in the PICU of the university hospital where this study was performed was estimated at 11.3%.[8] Due to the fact that severe chronic lesions generally result from the evolution of acute lesions,[9] it is of utmost importance to know the epidemiology of the latter, in order to generate data for the prevention of severe laryngeal lesions.

Therefore, this study aimed to describe the incidence and type of acute laryngeal lesions after extubation in the PICU.

Methods

This cross-sectional study involved a cohort of children, aged from birth to <5 years, admitted to the PICU of a university hospital between November of 2005 and November of 2012 who were submitted to endotracheal intubation for more than 24 h and whose parents or guardians authorized the inclusion in the study. Exclusion criteria included patients with previous history of stridor or known laryngeal disease,