

Deleterious Facial Effects of Noninvasive Ventilation in Children

Opinion

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Abstract

Noninvasive ventilation can have noticeable effects on the facial structures of children. Monitoring and assessing these effects in children undergoing noninvasive ventilation is crucial to minimize potential long-term consequences and provide appropriate interventions that support optimal facial growth and development.

Keywords: Noninvasive ventilation, Adverse effects, Children, Pediatric Dentistry, Pediatric, General Health, Development, Disabled Persons, Facial

Introduction

Noninvasive ventilation (NIV) is used to support children with breathing difficulties. It involves delivering oxygen or air through a mask or nasal prongs without procedures like intubation [1]. While NIV has been proven effective in managing conditions, a recent publication has highlighted its negative impact on facial growth and shape in children, raising concerns about the physical and psychological well-being of these children. Prolonged and continuous pressure from the ventilator mask can result in changes in appearance and development. These effects may include asymmetry, flattening of the cheekbones, misalignment of the jaw, and even alterations to the shape of the face [2].

The increased occurrence of abnormalities in the structure of the face, such as the displacement of the jaw and misalignment of teeth, highlights the significance of monitoring how facial development and growth patterns progress in children who receive long-term NIV [3]. Existing literature has pointed out that NIV may affect the develop-

ment of the part of the face mainly when it is applied during early childhood and for extended durations like 24 hours a day [4]. It has also been noted that children using NIV should be cautious about damage to their skin caused by ventilation interfaces [5].

The field of NIV for children has made advancements over time, transforming the way we provide support to young patients. The NIV technique's introduction aimed at offering assistance without resorting to procedures like endotracheal intubation or tracheostomy [5]. Early pioneers recognized NIV's advantages, including reduced rates of sickness and death, improved patient comfort, and preservation of airway structure and function [5]. As research and technology progressed, specialized modes and devices explicitly tailored for patients were developed, revolutionizing how we manage distress in children and providing a safer alternative to traditional ventilation methods [5].

While NIV seems to be well tolerated among patients, it is crucial to address any adverse impacts on facial development [6,7]. Furthermore, there is a risk of pressure ulcers developing beneath the mask



used for NIV treatment [8]. Moreover, a recent study shed light on the outcomes of freedom and survival in children who require long-term ventilation, contributing to our understanding of the challenges related to NIV in pediatric patients [9]. Long-term NIV has become more prevalent in managing failure and airway obstruction among children, highlighting the significance of monitoring and effectively addressing the implications associated with NIV treatment in pediatric cases. Furthermore, a study provided insights into liberation and mortality outcomes in pediatric long-term ventilation, contributing to understanding the challenges associated with NIV in children [10].

The utilization of NIV in treating distress and failure among children is increasingly acknowledged [11]. However, it is crucial to note that employing preintubation NIV in cases where pediatric acute respiratory distress syndrome is present may potentially result in outcomes compared to not using preintubation NIV [12]. So, it is essential to emphasize the significance of considering the clinical situation and individual patient characteristics when using NIV for pediatric cases. Moreover, introducing a high-flow nasal cannula has been an advancement in the application of NIV, greatly influencing the practice of care for pediatric patients [13]. NIV's global utilization and impact in acute respiratory distress syndrome cases remain subjects of research and exploration [14]. The increasing concern regarding the effects of NIV on development in children necessitates investigation into understanding the possible mechanisms behind these changes and their implications for clinical practice [2].

Final Considerations

In NIV has a history of being utilized to treat respiratory conditions in children. The progress and improvements made in NIV have significantly revolutionized the management of distress among patients by providing a safer and less invasive alternative to traditional ventilation methods. However, it is crucial to consider the clinical context and individual patient characteristics when implementing noninvasive ventilation for pediatric cases to ensure optimal outcomes. The adverse facial effects associated with prolonged use of ventilation in children have become a concerning topic, with studies highlighting its negative impact on facial growth and shape, particularly among infants and young children.

Conclusion

Further exploration of the underlying mechanisms driving these alterations and their impact on procedures is crucial. It highlights the significance of monitoring and addressing the consequences of noninvasive ventilation in children, particularly involving a pediatric dentist within the pediatric team to ensure optimal facial growth and development.

Sources of Support

None

Declaration of Conflicts of Interest

The author confirms no conflicts of interest.

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