NEBULIZED KETAMINE IN A PEDIATRIC PATIENT WITH SEVERE ASTHMA EXACERBATION

N. Djobbi, H. Besbes , S. Bouguerra , O. Maatouk , A. Chaabane , C. Chouchane , S. Chouchane .

faculty of medecine of monastir-universiy of monastir, peadiatric, Tunisia.

Background and Aims :

Asthma is a major cause of morbidity and mortality despite advances in outpatient treatment. Sometimes, children fail to respond to standard treatment and can potentially require mechanical ventilation

Case report :

A 3 years-old-boy with Prader willi syndrome was admitted in the peaditric intensive care unit (ICU) for respiratory distress and wheezing.

He had a medical history of remarkable episodes of acute wheezing at aged 8 and 12 months.

On admission, the patient displayed marked accessory muscle use and had an oxygen saturation of 90%. He received many doses of terbutaline 2 mg and ipratropium bromide 250 µg for an hour duration via a nebulizer device, as well as intramuscular Dexaméthasone (0.2mg/Kg).

He had become less responsive; oxygen saturation was only 92% on high-flow oxygen (10 l/min). Arterial blood gases showed pH 7.29; pCO2 = 9 Kpa and pO2 = 92. mmhg .

We decided to attempt ketamine nebulization (1mg/kg) as a last resort concomitantly with preparing the patient for a possible intubation. Twenty minutes after, the patient's respiratory status markedly improved, minimally audible wheezing on chest auscultation and oxygen saturation level increased to 98%. Blood gas analysis showed marked improvement: pH of 7.33,pCO2 of 5 Kpa and pO2 of 100 mmhg .

He did not experience any exacerbation overnight and was discharged from ICU 12 hours later.

Conclusion:

The uncommon use of nebulized ketamine in this case indicates that this route might be a promising option in the management of severe asthma exacerbation in children.

Discussion :

- Children are frequently admitted for acute asthma exacerbation in the emergency department.
- In some cases, standard regimens treatment fails and mechanical ventilation is required.
- ketamine IV for the treatment of severe asthma exacerbation has been shown in case reports and observational studies to improve outcome and preventing mechanical ventilation [1-3].
- Nebulized ketamine have suggested that this route of use is both effective and plausible for various situations [5-8]
- Advantages include rapid delivery and absorption into the systemic circulation and the possibility of administration without the need of IV access line.
- However, the use of nebulized ketamine for treatment of asthma in humans has never been investigated.
- In a murine model of reactive airway disease, Zhu et al. studied the effect of ketamine inhalation on bronchial hyperresponsiveness and airway inflammation.
- As confirmed by lung histological examination, Th2 cytokine levels and total and differential cell counts in the broncho-alveolar lavage fluid, it was demonstrated that nebulized ketamine inhibits the cascade of inflammation and reduces markers of inflammation [9].
- It is also plausible that the systemic effect of ketamine induced anxiolysis and a decrease in the mechanical load breathing without compromise of the respiratory drive.
- In our case, Ketamine may have provided time for standard therapies to take effect, and thereby obviate intubation

References :

[1] Shlamovitz GZ, Hawthorne T. Intravenous ketamine in a dissociating dose as a temporizing measure to avoid mechanical ventilation in adult patient with severe asthma exacerbation. J Emerg Med. 2011;41:492-4.

[2] Denmark TK, Crane HA, Brown L. Ketamine to avoid mechanical ventilation in severe pediatric asthma. J Emerg Med. 2006;30:163-6.

[3] Kiureghian E, Kowalski JM. Intravenous ketamine to facilitate noninvasive ventilation in a patient with a severe asthma exacerbation. Am J Emerg Med. 2015;33(11):1720.e1-2.

[4] Lau TT, Zed PJ. Does ketamine have a role in managing severe exacerbation of asthma in adults? Pharmacotherapy. 2001;21:1100-6.

[5] Elhefny RA, Elsonbaty M, Nassib S, Mansour M. Is this the time to introduce ketamine in acute respiratory distress syndrome? A pilot study. Egypt J Cardiothorac Anesth 2015;9:23-8

[6] Ahuja V, Mitra S, Sarna R. Nebulized Ketamine decrease incidence and severity of post-operative sore throat. Indian J Anaesth. 2015;59(1):37-42.

[7] Zanaty OM, El Metainy SA. A comparative evaluation of nebulized dexmedetomidine, nebulized ketamine, and their combination as premedication for outpatient pediatric dental surgery. Anesth Analg. 2015 Jul;121(1):167-71.

[8] Elkoundi A, Bensghir M, Lalaoui SJ. Nebulized ketamine for successful management of difficult airway. J Clin Anesth. 2017;41:71-2.

[9] Zhu MM, Zhou QH, Zhu MH, Rong HB, Xu YM, Qian YN, et al. Effects of nebulized ketamine on allergen-induced airway hyperresponsiveness and inflammation in actively sensitized Brown-Norway rats. J Inflamm (Lond) 2007;4:10.