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Management of Post-Operative Pharyngeal Pain: Use of Ketamine and Other Agents

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Abstract

Postoperative pharyngeal pain is considered within the list of ten most frequent complications in anaesthesia. Its wide frequency and associated with the intervention of the airway for surgical procedures, specifically under general anaesthesia makes the study of this complication mandatory to improve the quality of care and patient satisfaction. Multiple postoperative interventions have been studied to reduce pharyngeal pain, but it seems that the best intervention comes from prevention. Multiple pharmacological and non-pharmacological measures must be taken into account for this complication. Ketamine, as an antagonist of the N-methyl-D-aspartate receptor, due to its ant nociceptive, anti-inflammatory and bronchodilator effect, has been one of the drugs of choice for the studies. Others such as corticosteroids and NSAIDs are also part of the group. Knowing about this pathology will help improve patient care and avoid extra costs at the time of care.

Keywords: Postoperative sore throat; Ketamine; Lidocaine; Steroids

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Introduction

Performing surgical interventions under general anaesthesia implies a great responsibility towards the patient. Among the complications that we must keep in mind and that decrease satisfaction and quality of care, especially if we consider elective interventions, is postoperative pharyngeal pain. Subjectively, it presents asodynophagia and although its time of occurrence is self-limited, it can become very annoying in the person who suffers from it. Pharmacological and non-pharmacological interventions will help manage these patients. In this review we will analyse the most up-to-date evidence on the pharmacological measures that can be considered according to expertise and preference for the management of postoperative pharyngeal pain.

Methodology

A systematic bibliographic search of the updated medical literature on the importance of malnutrition in the psychomotor development of children was carried out, using databases such as: PubMed, Science direct and Google Scholar. Descriptors such as postoperative pharyngeal pain, ketamine, lidocaine, anaesthetics were used. Both review and original articles were used, taking into account that their year of publication was less than 5 years.

Results

Performing multiple surgical procedures requires securing the airway through endotracheal intubation to be carried out. This can lead to a series of complications in the respiratory tract,

among which postoperative pharyngeal pain (PPD) stands out [1-4]. PFD is subjectively described as the sensation of discomfort or pain that occurs in the posterior pharynx after the endotracheal

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intubation process. It is caused by a direct mechanical injury occurring in the given procedure due to inflammation and edema of the mucosa, excessive muscular contraction and pressure generated from the cuff of the endotracheal tube, placement time and concomitant mucosal dehydration [5-7].

The frequency of appearance varies in the current literature from 20 to 70% and has a high morbidity that per se increases costs, length of hospital stay and risks associated with medical care. It is considered a self-limited process of up to 96 hours, although there have been cases of longer duration and factors such as the size and pressure of the endotracheal tube cuff, suction attempts, time and manipulations necessary to insert the tube, female sex, young and the administration of succinylcholine can predict the presence of PFD [8-12].

There are different types of therapy for the management of PFD that can be classified into non-pharmacological and pharmacological methods. For the former, the size of the tube, lubrication of the tube at the time of placement, use of humidifiers in the circuit, gentle laryngoscopy, gentle aspiration, management of cuff pressure (less than 25 cmH₂O), avoidance of changes in the position of the head and gentle extubation [13].

Within pharmacological therapies, multiple medications with analgesic and anti-inflammatory effects have been described. Among them, nebulization therapy with small volumes of drugs has been shown to improve patient compliance and reduce adverse events compared to other methods (gargles, intravenous, etc.). Among the most used in aerosol presentation are corticosteroids, ketamine, magnesium and non-steroidal anti-inflammatory drugs [14-17].

Inhaled/aerosol corticosteroids: used for the management of asthma and as prophylaxis for PFD by reducing inflammation, edema, fluid transudation and pain intensity. They can prevent PFD, cough, hoarseness, and reduce postoperative laryngeal edema and reintubation [18].

N-methyl-D-aspartate (NMDA) receptor antagonists – Ketamine and Magnesium: included for their ant nociceptive, anti-inflammatory and bronchodilator effect. The reduction in the incidence and severity of PFD is attributed to peripheral analgesia and the anti-inflammatory effect of nebulization [19]. Ketamine has been used for its described properties, in addition to avoiding adverse effects due to its local and non-systemic effect. By means of nebulization's, the bitter taste of the medicine is reduced to zero, the volume required is smaller and the patient's cooperation is improved [20-23].

Non-steroidal anti-inflammatory drugs (NSAIDs) Benzydamine Hydrochloride: it has analgesic and local

anaesthetic action. Especially for oropharyngeal inflammation. The incidence and severity of PFD does not appear to be alleviated by oral spray and the significant reduction in PFD relative to placebo is only seen 24 hours after surgery [24]. (Table 1).

Discussion

According to the reported incidence, PFD is one of the most undesirable and common results associated with procedures that require endotracheal intubation; it can occur in up to almost a third of patients and has been established as a marker of quality of care since it is among the 10 most uncomfortable conditions that represent patient dissatisfaction [25-27].

Yu, et al. in a systematic review and meta-analysis of approximately 32 randomized clinical trials, compared the efficacy of different available nebulized agents for the management of PFD in order to guide clinical decisions. The results included the incidence of PFD at 1 hour and 24 hours after the surgical procedure and the severity of PFD after one day of the operation. From the data it was obtained that, with the exception of nebulized lidocaine, nebulized corticosteroids, ketamine, magnesium and benzamine hydrochloride are effective in reducing PFD 24 hours after surgery compared to non-analgesics and additionally, the first three showed a significant effect in reducing early PFD and its severity. The authors conclude that the prophylactic use of nebulized drugs such as corticosteroids, magnesium and ketamine are effective in preventing PFD [28].

There may be some controversy about the true benefit of using NMDAs such as ketamine in the management of PFD patients. A prospective, randomized, double-blind, experimental study that included two groups of randomized patients to compare Ketamine VS placebo in decreasing PFD after elective surgery under general anaesthesia and analysing vital signs, symptoms and pain intensity at one hour the 4 hours of the procedure on a numerical scale concluded that the use of nebulized ketamine does not represent a statistically significant advantage [29].

However, another controlled, double-blind, prospective, randomized study conducted in India, with the participation of 100 patients between 20 and 60 years of age undergoing surgery under general anaesthesia, and with an incidence of PFD of 33%, showed that the management with ketamine nebulization significantly attenuates the incidence and severity of PFD, especially in the early postoperative period, without observable adverse effects [30].

All of the foregoing makes us take more into consideration drug dosage, type of population, exposure time, surgical intervention time, among other data that may be key determinants when

Table 1. Description of the different pharmacological and non-pharmacological methods that can be used to manage postoperative pharyngeal pain.

| MANAGEMENT OF POST-OPERATIVE PHARYNGEAL PAIN | | |
|---|------------------|--------------------------|
| NON-PHARMACOLOGICAL MEASURES | | PHARMACOLOGICAL MEASURES |
| <ul style="list-style-type: none"> Choosing the appropriate ETT size. Abundant lubrication during ETT placement. Appropriate laryngoscopy technique. Cuff pressure less than 25 cmH₂O. Gentle extubation. | corticosteroids | method of choice |
| | NMDA antagonists | method of choice |
| | NSAIDs | method of choice |
| | lidocaine | Not supported by studies |
| | Placebo | Not supported by studies |

using the drug for that purpose.

Even though individual studies show the contrary, several current meta-analyses are gradually elucidating the benefit of the use of NDMA (Ketamine)-type drugs for the management of patients with PFD. Wang et al showed through their analysis that among the 6 topical medications they studied, lidocaine is not optimal for preventing PFD, but glycyrrhine, corticosteroids, NSAIDs, and NMDA antagonists, including ketamine, are associated with a reduction. Of the DFP in 4 the time intervals studied and that its choice will already depend on the clinical experience and preferences of the patient [25].

On the other hand, the literature also shows that there are various ways of administering the drug, and even though aerosol is the method of choice for both Ketamine and the rest of the drugs studied, there are studies that compare the impact of different dose of ketamine administered via gargle. Kheirabadi, et al, through a single-blind randomized controlled trial, studied 96 patients selected for septoplasty surgery under general anaesthesia and performed 3 groups in which gargles

with 50 and 100 mg of ketamine dissolved in saline solution were administered and the third saline alone for 30 seconds to 5 minutes prior to tracheal intubation. In their conclusion, they describe that the use of 100 mg of the drug exceeds 50 mg or only saline solution, without increasing complications or patient dissatisfaction for the management of PFD [22].

Conclusion

It is evident that postoperative pharyngeal pain is a complication that requires knowing how to treat. Currently there are controversial studies that do not support the use of certain agents such as ketamine, but systematic reviews and meta-analyses are gradually elucidating the importance of using them as the method of choice in this pathology, the appropriate dose, the form of administration and the right moment. Still, it is important to stress that prevention, rather than treatment is the best approach to improving quality of care and patient satisfaction in what is reported as the eighth worst clinical anaesthesia outcome.

References

- 1 Yu J, Ren L, Min S, Yang Y, Lv F (2020) Agentes farmacológicos nebulizados para prevenir el dolor de garganta posoperatorio: una revisión sistemática y un metanálisis en red. *PloS uno* 15:e0237174.
- 2 Franco-Cabrera, Montserrat, Aguirre-Ibarra, Claudia Patricia, Nava-López (2019) Ketamina nebulizada para la prevención del dolor faríngeo posoperatorio. *Revista mexicana de anestesiología* 42:7-18.
- 3 Wang G, Qi Y, Wu L, Jiang G (2021) Comparative Efficacy of 6 Topical Pharmacological Agents for Preventive Interventions of Postoperative Sore Throat After Tracheal Intubation: A Systematic Review and Network Meta-analysis. *Anesth Analg* 133:58-67.
- 4 AHUJA V, MITRA S, SARNA R (2015) Nebulized ketamine decreases incidence and severity of post operative sore throat. *Indian J Anaesth* 59:37-42.
- 5 Inoue S, Abe R, Tanaka Y, Kawaguchi M (2015) Tracheal intubation by trainees does not alter the incidence or duration of postoperative sore throat and hoarseness: a teaching hospital-based propensity score analysis. *Br J Anaesth* 115:463-469.
- 6 Teymourian H, Mohajerani SA, Farahbod A (2015) Magnesium and Ketamine Gargle and Postoperative Sore Throat. *Anesth Pain Med* 5:1-5.
- 7 El-Boghdadly K, Bailey CR, Wiles MD (2016) Postoperative sore throat: a systematic review. *Anaesth* 71:706-717.
- 8 Tanaka Y, Nakayama T, Nishimori M, Tsujimura Y, Kawaguchi M (2015) Lidocaine for preventing postoperative sore throat. *Cochrane Database Syst Rev* 14.
- 9 Yadav M, Chalumuru N, Gopinath R (2016) Effect of magnesium sulfate nebulization on the incidence of postoperative sore throat. *J Anaesthesiol Clin Pharmacol* 32:168-71.
- 10 Kuriyama A, Maeda H, Sun R (2019) Aerosolized corticosteroids to prevent postoperative sore throat in adults: a systematic review and meta-analysis. *Acta Anaesthesiol Scand* 63:282-291.
- 11 Kuriyama A, Aga M, Maeda H (2018) Topical benzydamine hydrochloride for prevention of postoperative sore throat in adults undergoing tracheal intubation for elective surgery: a systematic review and meta-analysis. *Anaesthesia* 73:889-900.
- 12 Singh NP, Makkar JK, Wourms V, Zorrilla-Vaca A, Cappellani RB et al. (2019) Role of topical magnesium in post-operative sore throat: a systematic review and meta-analysis of randomised controlled trials. *Indian J Anaesth* 63:520-529.
- 13 Mayhood J, Cress K (2015) Effectiveness of ketamine gargles in reducing postoperative sore throat in patients undergoing airway instrumentation: a systematic review. *JBI Database System Rev Implement Rep* 13:244-278.
- 14 Liao AH, Yeoh SR, Lin YC, Lam F, Chen TL et al.(2019) Lidocaine lubricants for intubation-related complications: a systematic review and meta-analysis. *Can J Anaesth* 66:1221-1239.
- 15 Kuriyama A, Nakanishi M, Kamei J, Sun R, Ninomiya K (2020) Topical application of ketamine to prevent postoperative sore throat in adults: A systematic review and meta-analysis. *Acta Anaesthesiol Scand*. 64:579-591.
- 16 Shekhar S, Gupta A, Gunjan, Gupta S, Singh K (2019) Comparison of Nebulized Ketamine and Ketamine with Clonidine in Postoperative Sore Throat. *Anesth Essays Res*. 13:313-316.
- 17 Segaran S, Bacthavasalame AT, Venkatesh RR, Zachariah M, George SK et al.(2018) Comparison of Nebulized Ketamine with Nebulized Magnesium Sulfate on the Incidence of Postoperative Sore Throat. *Anesth Essays Res* 12:885-890.
- 18 Thomas D, Bejoy R, Zabrin N, Beevi S (2018) Preoperative ketamine nebulization attenuates the incidence and severity of postoperative

- sore throat: A randomized controlled clinical trial. *Saudi J Anaesth* 12:440-445.
- 19 Singh NP, Makkar JK, Cappellani RB, Sinha A, Lakshminarasimhachar A (2020) Efficacy of topical agents for prevention of postoperative sore throat after single lumen tracheal intubation: a Bayesian network meta-analysis. *Can J Anaesth* 67:1624-1642.
 - 20 Orji MO, Osinaike BB, Amanor-Boadu SD, Ugheoke A (2020) NEBULIZED MAGNESIUM VERSUS KETAMINE For Prevention Of Post-Operative Sore Throat In Patients For General Anaesthesia. *Ann Ib Postgrad Med* 18:3-8.
 - 21 Rajan S, Malayil GJ, Varghese R, Kumar L (2017) Comparison of Usefulness of Ketamine and Magnesium Sulfate Nebulization's for Attenuating Postoperative Sore Throat, Hoarseness of Voice, and Cough. *Anesth Essays Res* 11:287-293.
 - 22 Charan SD, Khilji MY, Jain R, Devra V, Saxena M (2018) Inhalation of Ketamine in Different Doses to Decrease the Severity of Postoperative Sore Throat in Surgeries under General Anaesthesia Patients. *Anesth Essays Res*. 12:625-629.
 - 23 Aigbedia SO, Tobi KU, Amadasun FE (2017) a comparative study of ketamine gargle and lidocaine jelly application for the prevention of postoperative throat pain following general anaesthesia with endotracheal intubation. *Niger J Clin Pract* 20:677-685.
 - 24 Kajal K, Dharmu D, Bhukkal I, Yaddanapudi S, Soni SL (2019) Comparison of Three Different Methods of Attenuating Postoperative Sore Throat, Cough, and Hoarseness of Voice in Patients Undergoing Tracheal Intubation. *Anesth Essays Res* 13:572-576.
 - 25 El-Boghdady K, Bailey CR, Wiles MD (2016) Postoperative sore throat: a systematic review. *Anaesthesia* 71:706-17.
 - 26 Sakkanan NV, Elakkumanan LB. Extubation (2020) Parameters and Postoperative Sore Throat. *Anesth Analg*. 130:e42-e43.
 - 27 Flexman AM, Duggan LV (2019) Postoperative sore throat: inevitable side effect or preventable nuisance? *Can J Anaesth* 66:1009-1013.
 - 28 Li H, Yue Y, Qu Y, Mu D (2020) Lidocaine for postoperative sore throat: a meta-analysis of randomized controlled trials. *Minerva Anesthesiol* 86:546-553.
 - 29 Vaida S, Prozesky J (2020) Postoperative sore throat and tracheal tube introducers. *Minerva Anesthesiol* 86:895-897.
 - 30 Christiansen P, Pedersen CH, Selter H, Odder L, Riisager JP (2021) How Does Tube Size Affect Patients' Experiences of Postoperative Sore Throat and Hoarseness? A Randomised Controlled Blinded Study. *J Clin Med* 10:5846.