

Preventive Analgesia as a Guarantor in Patients Undergoing Tonsillectomy. Report of 62 Cases

José Luis Carranza Cortés^{1*} and Eva del Carmen Puga Flores²

¹Anesthesiologist, Ambulatory Surgery Unit of Health Services of Nayarit (UCA-SSN), Mexico

²Otorhinolaryngologist UCA-SSN, Mexico

*Corresponding Author: José Luis Carranza Cortés, Anesthesiologist, Ambulatory Surgery Unit of Health Services of Nayarit (UCA-SSN),

Received: March 05, 2018; Published: May 14, 2018

Abstract

Introduction: Postoperative pain is one of the causes of hospital prolongation in patients who have previously been classified as outpatients.

Objective: The general objective of the study was to determine the usefulness of non-steroidal analgesics and dexamethasone in the preventive analgesia modality.

Material and Method: A descriptive study was performed in patients undergoing adeno-tonsillectomy-surgery, who covered the inclusion criteria. The following drugs were administered preventively: ketorolac 60 mg/kg standard dose, metamizole 30 mg/kg and dexamethasone at the rate of 200 mg/kg. The statistical index used was; "T" Paired, for parametric variables, with $p < 0.05$; And Chi Square (X^2), with $p < 0.05$, for the evaluation of pain.

Results: A total of 62 patients were studied ($N = 62$), with age: $X = 15.85 \pm 4$ years; Fifty patients were identified as ASA I; And 12 patients as ASA II. It is observed that in 58 patients of the study the pain was controlled without the need of rescue doses 4 patients were given rescue doses. Statistical analysis showed statistically significant differences in pain assessment, with the following values: Statistic of $X^2 = 4.133$, with 4 degrees of freedom, with a critical value of 9.49, with a $p < 0.05$.

Discussion: The results of our study demonstrate the utility of administering the analgesic drugs described by the method of preventive analgesia, with a quality aggregate that was dexamethasone, which reduced morbidity and shorten the length of hospital stay.

Keywords: Preventive Analgesia; Ketorolac; Metamizole; Dexamethasone

Introduction

Postoperative pain is one of the causes of hospital prolongation in patients that has been previously classified as ambulatory. Nociceptive activity activates inflammatory mediators, with central sensitization so that painful activity persists. This central sensitization and painful activity causes spinal facilitation for the subsequent transmission of painful stimuli [1].

With the central idea of controlling postoperative pain, several studies have been carried out in which they present alternatives as it is; multimodal analgesia, anticipated analgesia and preventive analgesia. García-Miranda and colleagues [2], perform a descriptive study where they analyze the intensity of pain in three times, with the use of several drugs; paracetamol, ketorolac, diclofenac, celecoxib, nalbuphine, buprenorphine and as adjuvant carbamazepine. The authors conclude that pain estimation and control was incomplete, based on postoperative EVA values that did not decrease from a rating of 5.

In another study carried out by algologists [3], they determine the prevalence of postoperative pain and its physiological repercussions, and conclude that this prevalence is high, although it should be almost totally controlled. In such a way that we try to open perspectives towards a concept superior to that of analgesia, which is the global comfort of the patient during the postoperative period.

The proposal of multimodal analgesia implies the adequate control of postoperative pain, which allows an early recovery of the normal activities of the patient, which is not possible to achieve with a single drug. The synergistic action of a group of drugs is necessary, in such a way that the total doses of each drug are reduced and in this way, the adverse effects of each group of drugs are reduced, which are administered by different routes [4]. Analgesia preventive is being used and in some reports the results are not very flattering.

Muñoz-Cepero [5], describes a study in which he administered in a group metamizol and in another diclofenac. In both groups, moderate pain was reported at 3 and 4 hours postoperatively, with a rescue dose for the metamizole group. Analgesic medications were administered after the induction of anesthesia. The results of this study show that the administration of a single drug for the control of postoperative pain is insufficient. This has been demonstrated in another study [6], where non-steroidal analgesics have been applied individually ketorolac versus metamizol, with pain control only partially; in 40% and 55% respectively.

The combination of drugs for pain control ketorolac plus tramadol, administered by different routes, yields favorable results, but nevertheless the patients of this study required rescue doses and presented nausea in an important percentage [7].

In another drug association, it has been proposed to use paracetamol with an NSAID, arguing that the effect of the first is by another route. It is mentioned that this combination provides greater analgesia, than when these medications are administered in isolation [8,9].

Dexamethasone has been included in analgesic therapy as a drug with some utility for pain control in post-tonsillectomy patients. Felix-Trujillo, *et al.* [10], perform a study with a controlled clinical trial design; administered dexamethasone at a dose of 1 mg/kg in three doses; The first one before the surgery and then every 8 hours. In their conclusions, they report a better analgesic effect of dexamethasone than the group that received acetaminophen.

Dexamethasone offers advantages that support its use; it has an important anti-inflammatory effect reducing the synthesis of arachidonic acid by phosphodiesterase A2 and inhibiting the expression of COX2, as well as antiemetic properties similar to that of specific antiemetics such as ondansetron, but according to the results published by some authors its effect is surpassed by droperidol [11].

Dexamethasone acts by inhibiting the synthesis of prostaglandins, decreases serum levels of beta endorphin and vasopressin at the intestinal level; it can prevent the release of serotonin, blocking the afferent stimuli for the Chemoreceptor Trigger Zone [12].

Problem Statement

Several methods have been used to control postoperative pain; anticipated analgesia, preventive analgesia, multimodal analgesia and the administration of analgesics individually in the postoperative period. The association of non-steroidal analgesics and dexamethasone, whose effect is to act by inhibiting the synthesis of prostaglandins and preventing the release of serotonin, blocking afferent stimuli for the Trigger Area Chemoreceptor, makes them the ideal complement to provide effective preventive analgesia, as well as reducing undesirable effects such as nausea and vomiting, which are important parameters for hospitalization criteria for surgical patients under outpatient treatment.

For the above reasons we ask the following question

Is the effect of non-steroidal analgesics and dexamethasone administered under preventive regimen useful in the patient undergoing adeno-tonsillectomy?

The main objective of this study is to determine the usefulness of non-steroidal analgesics and dexamethasone in the modality of preventive analgesia, in patients post-operated under the ambulatory adenotonsillectomy regimen, as well as to determine the presence of morbidity factors, the time of intake and hospital discharge time.

Material and Method

A descriptive study Series of Cases was carried out, with the following methodological design.

For its objective descriptive; for the maneuver of impact; for the assignment of the descriptive maneuver; for the transverse temporality; by prospective directionality; by obtaining proactive information; for the location of the unicentric study; by the blindness of the open-maneuver evaluation; by the type of population homodemico.

This study was carried out in the Ambulatory Surgery Unit of the Health Services of Nayarit (UCA-SSN). With the following inclusion criteria: Patients with Physical Status ASA (American Society Anesthesiologist) I-II. With an age between 6 and 45 years of elective surgery in the specialty of Otorhinolaryngology dededo-tonsillectomy, with basic laboratory studies in ranges of normality; Hematic Biometry, Evidence of Hemorrhagic Tendency; in some cases Blood Chemistry and Electrocardiogram patients over 40 years, and written acceptance of the procedure by the responsible family member.

The criteria for elimination were when patients presented an incident during the transoperative period.

Method

The start of the study starts from the pre-anesthetic consultation, where the patient was evaluated and it is determined if he is admitted to the study, the family member is informed if he is a minor, or the patient is directly if he is an adult, in what the study consists.

Anesthetic technique: The modality of balanced general anesthesia was used as an anesthetic technique, consisting of: Sevoflurane + Oxygen and anesthetic agents such as propofol, fentanyl, vecuronium bromide.

For the emersion of anesthesia, the following medications will be used: neostigmine + atropine at a ponderal dose.

Before starting the surgical procedure, the medicines contemplated in the project of preventive analgesia will be administered, that is: metamizol at a rate of 30 mg/kg; ketorolac 60 mg as a standard dose in adults and in schoolchildren 1 mg/kg. In addition, dexamethasone is included at a rate of .200 mg/kg. These drugs are administered in infusion, in sun isotonic 0.9% 150 ml.

When the patient leaves the operating room and enters the post-anesthesia recovery room, the Analog Visual Scale (VAS), of pain, will be applied to the adult patient. For the school patient, the Wong-Baker Faces scale was applied. In case of postoperative pain more than 2 points, 30 mg of ketorolac will be administered as a rescue in adults and in schoolchildren .5 mg/kg.

During your stay in this ward, which is until your recovery, the vital signs will be monitored and the adjuvant medication etamsylate 250 mg and Hartman's solution will be administered at a rate of 100 ml/hour. The hemodynamic behavior, the presence of morbidity data nausea, vomiting and pain, time of first intake and time of externalization are evaluated.

Afterwards, the patient is discharged from the recovery room, assessed by the Aldrete method 10 points, and enters the preparation room where he remains under the same surveillance until his outpatient surgery unit. The patient is external to his home within a period of no more than 4 hours and the hemodynamic parameters and possible clinical morbidity data are recorded. The evaluation of the points that appear in the scale of assessment of modified Aldrete is applied, for ambulatory major surgery 20 points; with a minimum of 18 to consider the high.

Data analysis; the parametric variables were analyzed in two phases; upon entering the unit and being discharged from the unit. The nonparametric variables pain, were analyzed in two phases that are; upon arrival at the anesthetic recovery room and upon discharge from the unit.

For the parametric variables, the statistical analysis that was used was the Paired "T", with $p < 0.05$, analyzing only two cuts, upon entry and exit of the unit. For the non-parametric variables, the statistical analysis that was used was Chi square (X^2), with $p < 0.05$.

Results

A total of 62 patients were studied ($N = 62$), with an age of $X = 15.85 \pm 4$, with a range of 6 to 45 years. With a weight of $X = 51 \pm 27$; Size $X = 1.48 \pm .12$. The physical condition of the patients according to the ASA was: ASA I (50), ASA II [12].

In table 1, the hemodynamic behavior of the patients is described, analyzed by Paired T with $P < 0.05$, which includes two cuts, in which no statistically significant differences are reported, between the admission and discharge values of the patient. hospital unit.

Variable	Unit income	Discharge of the Unit	P < 0.05
FC Beats/min.	X = 83.06 +/- 12	X = 94.95 +/- 9	NS
TAS mmHg	X = 110.6 +/- 15	X = 111.8 +/- 10	NS
TAD mmHg	X = 71.86 +/- 7	X = 69.37 +/- 8	NS
SatPO ₂ (%)	X = 96.93 +/- 2	X = 96.73 +/- 2	NS
Temperature (centigrade)	X = 36.16 +/- 1	X = 36.09 +/- 1	NS

Table 1: Hemodynamic Variables.
Paired T $p < 0.05$

In table 2; a contingency table of 2 x 2, of pain behavior, analyzed by Chi square (X^2), where $X^2 = 4.133$, with 4 degrees of freedom, with a critical value of 9.49, with $p < 0.05$, is shown. with the following statistical interpretation:

Groups	Con	Sin	Total
Final	4	58	62
Surgery high	0	62	62
Unity			
Total	4	120	124

Table 2: Pain Contingency Chart of 2 X 2. $X^2 = 4.133$ with 4 degrees of freedom, with a Critical Value of 9.49, with $p < 0.05$.

There are statistically significant differences between the observed frequencies of the presence and absence of pain; with a higher frequency in the control of pain with the therapy of administering the two NSAIDs and dexamethasone in a preventive analgesia regimen.

The present study shows the following behavior in the face of morbidity data: 4 patients (6.45%) presented valuation of VAS greater than 2 and required rescue doses. These four patients were adults, who presented more fibrosis in the tonsillar bed.

None of the patients in the study had nausea and vomiting.

The oral tolerance was at 150 minutes 2.30 hours, the hospital discharge was at 3 hours postoperatively. No patient required hospital readmission and there were no complications in any patient.

During the transoperative period there was no bleeding suggesting an effect attributable to the medications, the quantification was in the range of what the surgeon considers permissible 30 ml in schoolchildren and 100 ml in adults.

Discussion and Conclusion

The anti-inflammatory properties of dexamethasone have been reported in clinical entities where the inflammatory process is a cause of dysfunction that accompanies pain in the immediate postoperative period. Its preventive application at a dose of 8 mg, reports a significant decrease in inflation in procedures such as the removal of third molars [13].

The combination of drugs may have a synergistic effect; Ketorolac, considered a non-steroidal analgesic, acts both centrally and peripherally. In inflammation and in painful processes, its peripheral action is due to the blocking of the enzyme COX, which synthesizes prostaglandins from arachidonic acid. It also has a central effect that produces an anti-hyperalgesic effect. Despite these pharmacological qualities, its analgesic effect is not enough to be used as a single analgesic agent, and it has another limitation for its administration; the doses cannot be exceeded, it has a ceiling effect [1].

Metamizole is also considered in the group of NSAIDs, its action is based on the inhibition of the production of a set of cellular mediators that intervene in different inflammatory processes, both pathological and physiological. These mediators, prostaglandins and thromboxanes, are produced by the action of cyclooxygenase, COX-1 and COX-2. They alter less the platelet aggregation and have less harmful effects on the gastric mucosa. They have a slight muscle relaxant effect, so they are useful in colic type pains [14].

With regard to the control of postoperative pain in patients undergoing surgery on tonsils and/or adenoids, Steward and colleagues [15] describe a study on analgesia in tonsil surgery in adult patients. It is comparative in three groups, where they analyzed the analgesic effect of piroxicam which was administered to one group, in the other group it was assigned dexamethasone and to the third group both medications were administered.

The results showed that the pain score was lower for the group to which both drugs were administered, however they did not manage to control the pain completely.

Other authors [16] conducted a study of postoperative analgesia in postoperative tonsillectomy and analyzed the administration of a single dose of dexamethasone associated with a transdermal patch containing diclofenac 200 mg, against a group to which a placebo was administered saline solution isotonic. The results showed that the study group presented a lower score on the pain scale, decreased the opioid consumption in the postoperative period, as well as the incidence of nausea and vomiting.

In a meta-analysis study [17], on postoperative analgesia in post-tonsillectomy patients, administering steroid drugs, where eight studies were included in the analysis; report that the dose of dexamethasone used ranged from 0.4 mg to 1 mg/kg, with a broad dose that varied from 8 to 50 mg. Results showed a significant reduction in pain during the first 24 hours postoperatively. Despite these results, it can be concluded that these cannot be conclusive, since there was no test to confirm the homogeneity of the studies that were included in this systematic study.

Vosdoganis., *et al.* [18] conducted a study in pediatric patients undergoing tonsillectomy surgery, who were administered preoperatively with a single dose of dexamethasone of .400 mg/kg. Report a decrease in the incidence of nausea and vomiting, as well as a stiffening for the time of food intake, decrease in the administration of rescue antiemetic drugs and intravenous fluids.

The doses administered of dexamethasone for the control of postoperative morbidity in patients undergoing tonsillectomies have a variable and wide range.

Kaufman used .500 mg/kg [19], Murat Karaman [20], administered in two study groups; .200 mg/kg and .700 mg/kg, intraoperatively. Hanasomo., *et al.* [21], administered doses of .1 mg/kg in a child population undergoing tonsillectomy with hot and cold surgical technique. Steward reports in a meta-analysis [22] of pediatric postoperative adeno-tonsillectomy patients, who administered doses of dexamethasone ranging from .150 to 1 mg/kg. Hiremath and her work group [23] administered a single dose of dexamethasone of .150 mg/kg in a population of 60 post-tonsillectomy patients.

In these mentioned studies, the authors report a decrease in morbidity, and a discrete decrease in pain, however morbidity data was still present. In our study, we reduced pain in 58 patients out of a total of 62 patients, who reported statistical significance analyzed by Chi Square. As far as morbidity is concerned; nausea and vomiting, we could control in 100% of cases. Another important data that throws the study that we made, is the short time in which the oral tolerance with a tolerated swallowing, as well as the time of externalization of the hospital unit, in addition to the non-re-admissions for complications inherent to the surgical anesthetic management.

The dose we use of dexamethasone (.200 mg/kg) is not in the alarm range of causing bleeding problems during the transoperative period. In a study carried out by Czarnetzky [24], he tries to determine which is the safest dose of dexamethasone that does not favor transoperative bleeding. I administer it in three study groups in three different doses of dexamethasone; to group A: 0.05 mg/kg; B: 0.150 mg/kg; C: .500 mg/kg. The results show that Group A presented only 4%; group B 11%, and group C 24%, so the author concludes; that the dose of .500 mg/kg of dexamethasone is associated with a higher risk of bleeding. In this same study it was observed that the analgesic requirements in the postoperative period decreased, as well as the nausea and vomiting.

Waldron Nh., *et al.* [25], perform a systematized study Meta-analysis, where they agree that the administration of dexamethasone in a single dose was associated with a lesser but significant decrease in pain, so the consumption of opioid analgesics in rescue was minor. In our study, we were able to control pain in 58 of the 62 patients studied, with a single dose of dexamethasone 200 mg/kg, adding non-steroidal analgesics at a ponderal dose analgesia preventive. In the analysis of pain using Chi-square X^2 , we found statistically significant differences. In our study group, there was no infection or delay in wound healing.

In our study with the association of NSAIDs and dexamethasone at a moderate dose .200 mg/kg in a single dose, administered as an infusion before the start of the surgical procedure, they showed an adequate analgesic effect; We eradicated the rest of the morbidity factors and shortened the time of oral intake, as well as the externalization of the hospital unit.

There were no cases of readmission or bleeding during the transoperative period, which is why we concluded that this therapeutic proposal of preventive analgesia with the drugs presented can be an effective alternative in patients undergoing adeno-tonsillectomy with cold ASA technique.

Bibliography

1. Sánchez-Arredondo CM. "Analgesia postoperatoria". *Fármacos* 16.1 (2003): 21-29.
2. García-Miranda GM., *et al.* "Tendencias de prescripción del dolor en un hospital de ortopedia y traumatología". *Revista Mexicana de Anestesiología* 35.1 (2012): 40-45.
3. Martínez-Vázquez de Castro J and Torres LM. "Prevalencia de dolor postoperatorio. Alteraciones fisiológicas y sus repercusiones". *Revista de la Sociedad Española del Dolor* 7 (2000): 465-476.
4. Reyes-Fierro A., *et al.* "Dolor postoperatorio: analgesia multimodal". *Patología del Aparato Locomotor* 2.3 (2004): 176-188.
5. Muñoz-Cepero M. "Analgesia preventiva con drogas antiinflamatorias no esteroideas en procedimientos quirúrgicos abdominales de urgencia". *Revista Cubana de Anestesiología y Reanimación* 12.3 (2013): 222-230.
6. Peñuelas-Acuña J., *et al.* "Ketorolaco versus Metamizol analgesia preventiva en niños". *Cirugía y Cirujanos* 71.1 (2003): 50-54.
7. Urbietta-Arciniega JI., *et al.* "Control del dolor postoperatorio con el uso de clorhidrato de tramadol y ketorolaco trometamina". *Revista Mexicana de Anestesiología* 27.2 (2004): 92-96.
8. Guevara-López U., *et al.* "Parámetros de practica para el manejo del dolor agudo perioperatorio". *Cirugía y Cirujanos* 73.3 (2005): 223-233.
9. American Society of Anesthesiologist Task Force for Acute Pain Management. "Practice guidelines for acute pain management in the perioperative setting". *Anesthesiology* 100 (2004): 1573-1581.
10. Félix-Trujillo MM., *et al.* "Efecto de la administración de dexametasona intravenosa en pacientes pediátricos postoperados de amigdalectomía con o sin adenoidectomía". *Anales de Otorrinolaringología* 50.3 (2005): 1-4.
11. Muñoz HR., *et al.* "Eficacia de la dexametasona en el tratamiento agudo de nauseas y vómitos postoperatorios. Comparación con droperidol y ondansetron". *Revista Medica de Chile* 134.6 (2006): 697-702.
12. Oriol-López SA., *et al.* "¿Ondansetron o dexametasona? Tratamiento de nausea y vómito postoperatorio en cirugía abdominal". *Revista Mexicana de Anestesiología* 32.3 (2009): 163-170.
13. Orellana A and Salazar E. "Evaluación clínica de la terapia con dexametasona e ibuprofeno en la cirugía de terceras molares detenidas". *Acta Odontológica Venezolana* 45.1 (2007): 1-9.

14. Montes – Pérez A. “Tratamiento del dolor agudo postoperatorio”. Recuperado 15 de marzo (2014).
15. Steward R and Bill R. “Dexamethasone reduces pain after tonsillectomy in adults”. *Clinical Otolaryngology* 27.5 (2002): 321-326.
16. Batthacharya S. “Single dose IV dexamethasone with preemptive transdermal diclofenaco patch reduces opioide requirement and postoperative tonsillectomy”. *Journal of Anaesthesiology Clinical Pharmacology* 25.1 (2009): 29-32.
17. Afman CE., *et al.* “Steroids for post-tonsillectomy pain reduction meta-analysis of randomized controlled trail”. *Otolaryngology–Head and Neck Surgery* 134.2 (2006): 181-186.
18. Vosdoganis F. “The Effects single doses intravenous dexamethasone in tonsillectomy in children”. *Anaesthesia and Intensive Care* 27.5 (1999): 489-492.
19. Kaufmann M., *et al.* “The effect of steroid therapy on post adenotonsillectomy recovery”. *Harefuah* 145.8 (2006): 577-580,630.
20. Murat Karaman, Dereci G., *et al.* “Determination of optimum dosage of intraoperative single dose dexamethasone in pediatric tonsillectomy and adenotonsillectomy”. *International Journal of Pediatric Otorhinolaryngology* 73.11 (2009): 1513-1515.
21. Hanasono NN., *et al.* “Perioperative steroids in tonsillectomy using electrocautery and sharp dissection techniques”. *Archives of Otolaryngology – Head and Neck Surgery* 130.8 (2004): 917, 921.
22. Steward DL., *et al.* “Do steroids reduce morbidity of tonsillectomy? Meta-analysis of randomized trials”. *Laryngoscope* 111.10 (2001): 1712-1718.
23. Hiremath DA. “Effect of dexamethasone for reducing post-tonsillectomy morbidity”. *Journal for Evolution of Medical and Dental Sciences* 41.2 (2013): 7909-7915.
24. Czarnetzky C and Elia N. “Dexamethasone and risk of nausea and vomiting and postoperative bleeding after tonsillectomy in children. A randomized trial”. *Journal of the American Medical Association* 300.22 (2008): 2621-2630.
25. Waldron NH., *et al.* “Impact of perioperative dexamethasone on postoperative analgesia and side-effects: systematic review and meta-analysis”. *British Journal of Anaesthesia* 110.2 (2013): 191-200.

Volume 4 Issue 6 June 2018

©All rights reserved by José Luis Carranza Cortés and Eva del Carmen Puga Flores.