International Journal of Otorhinolaryngology and Head and Neck Surgery
De Sousa FA et al. Int J Otorhinolaryngol Head Neck Surg. 2021 Dec;7(12):1847-1850
http://www.ijorl.com
pISSN 2454-5929 | eISSN 2454-5937

DOI: https://dx.doi.org/10.18203/issn.2454-5929.ijohns20214676

Original Research Article

Pediatric otolaryngology: influence of ambulatorial surgical procedures on postoperative pain

Francisco Alves de Sousa*, Maria Jorge Casanova, Ana Nóbrega Pinto, Miguel Bebiano Coutinho, Cecília Almeida e Sousa

Department of Otorhinolaryngology and Head and Neck surgery, Centro Hospitalar Universitário do Porto, Porto, Portugal

Received: 02 October 2021
Revised: 01 November 2021
Accepted: 03 November 2021

***Correspondence:**
Dr. Francisco Alves de Sousa,
E-mail: franciscoalvesousa@gmail.com

ABSTRACT

Background: In Pediatric Otolaryngology surgery associating procedures is a common finding. Each surgical act elicits different degrees of pain, with implications on recovery. The aim of this work was to evaluate the severity of children's pain after outpatient surgery, considering combinations of common Otolaryngologic procedures.
Methods: Data from children submitted to surgery in the Pediatric ambulatory Unit of Centro Hospitalar Universitário do Porto was reviewed. Children with history of previous interventions or any associated comorbidity were excluded. Postoperative pain at hospital discharge using the Universal Pain assessment tool (0-10) was assessed and compared concerning the various procedures.
Results: A total of 954 operated children were included. Adenoidectomy was performed in 783 patients (82.1%), tonsillectomy in 714 (74.8%), myringotomy in 432 (45.3%) and radiofrequency inferior turbinoplasty in 98 (10.3%). Patients undergoing tonsillectomy showed significantly higher pain scores (1.48±1.02 in tonsillectomy versus 0.89±0.75 in no tonsillectomy, p=0.001). Importantly, adenoid curettage, radiofrequency inferior turbinoplasty and myringotomy did not associate with increased post-operative pain (p>0.05). Number of procedures within the same intervention and surgical indication (recurrent infections, obstructive sleep disordered breathing and otitis media with effusion) did not influence post-operative pain scores (p>0.05).
Conclusions: Performing total tonsillectomy was the most important influencer of post-operative pain in Pediatric ambulatory surgery in this cohort. Performing concomitant adenoidectomy, turbinoplasty or miringotomy do not seem to influence post-operative pain significantly. A higher number of procedures within the same intervention does not associate directly with postoperative pain scores.

Keywords: Paediatric otolaryngology, Children, Surgery, Post operative pain, Tonsillectomy

INTRODUCTION

Surgical interventions are associated with variable postoperative pain. In Pediatric populations self-reports from children should be considered the gold standard, as parents tend to give inaccurate estimates of their child´s pain.[1] In Pediatric Otolaryngology (ORL) postoperative pain is particularly difficult to assess and manage, since children may lack verbal and cognitive abilities to describe it properly. Current evidence suggests that severe pain in children has significant long-lasting effects, and suboptimal postoperative pain management is a common finding, especially following ambulatory surgery.[2] Uncontrolled postoperative pain is associated with complications such as restless sleep, behavioral changes and difficulty taking oral fluids, which can potentially

compromise the recovery period.[3,4] Thus, it is important to be aware on what to expect after each surgical action, while assessing and treating pain accordingly following surgery.

The aim of this study was to evaluate the severity of children's pain after outpatient surgery, considering the various combinations of ORL procedures. The work ultimately aims to evaluate the pain-eliciting predictors in Pediatric Otolaryngology surgery.

METHODS

A retrospective analysis of data from children submitted to primary ORL surgery in the pediatric ambulatory unit of Centro Hospitalar Universitário do Porto between 2016 and 2020 was performed. In order to obtain a convenience sample, children with associated diseases, previous surgery, or considered for inpatient surgery were excluded. The postoperative pain at hospital discharge was obtained from the medical records of the selected patients and was assessed by using the Universal Pain assessment tool (either the 0-10 numeric scale or a faces-scale converted to correspondent numerical when appropriate). Pain scores from the different subgroups were compared. Recurrent infections were considered a surgical indication when meeting the formal American Academy of Otolaryngology guidelines.[5] Obstructive sleep disordered breathing (OSDB) was considered mainly based on clinical records from relative's information (reported or filmed respiratory pauses), or Polysomnography reports when present. Otitis media with effusion was considered only when intraoperative effusion was noted. The same Tonsillectomy (total cold dissection with pillar suture), adenoidectomy (curettage), myringotomy (sharp incision under otomicroscopy with tympanostomy tube placement) and inferior turbinoplasty (Radiofrequency ablation) techniques were used.

Statistical analysis was performed using Statistical package for social sciences (SPSS) (IBM SPSS Statistics 26). Categorical variables are presented as percentages, and continuous variables as means and standard deviations, or medians and interquartile range for variables with skewed distributions. Normal distribution was checked using skewness and kurtosis. The bivariate associations were analyzed using either Independent t-test (parametric analysis) or Mann-Whitney test (non-parametric analysis) depending on the tests for normality. All reported p values are two-tailed, with a $p \leq 0.05$ indicating statistical significance. The study design complies with the Declaration of Helsinki ethical standards.

RESULTS

A total of 954 children were eligible. The mean age at surgery was 5.70±2.926 years. 53.8% of patients were male. Post-operative mean pain score was 1.33±3.538. Adenoidectomy was performed in 783 patients (82.1%), tonsillectomy in 714 (74.8%), myringotomy in 432 (45.3%) and radiofrequency inferior turbinoplasty in 98 (10.3%). Concerning surgical indications, 342 (35.45%) patients had obstructive sleep disordered breathing; 276 (28.9%) had otitis media with effusion and 542 (56.8%) showed repetitive upper respiratory infections.

Table 1: Comparison of pain score means on different subgroups: with and without procedure.

Procedure	Pain mean (0-10)±SD Yes	Pain mean (0-10)±SD No	P value
Tonsillectomy	1.48±1.02	0.89±0.75	0.001
Adenoidectomy	1.32±0.89	1.37±1.01	0.782
Inferior Turbinoplasty	1.17±0.92	1.35±0.82	0.402
Myringotomy	1.29±1.02	1.35±1.07	0.735

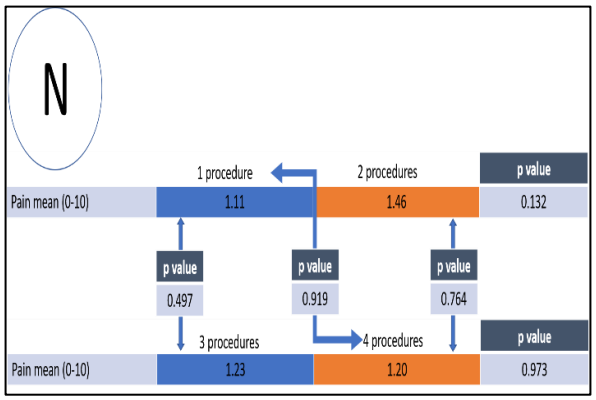

Figure 1: Comparison of pain score means within number of associated procedures (n) (combination of tonsillectomy, adenoidectomy, myringotomy, inferior turbinoplasty).

Patients undergoing tonsillectomy showed significantly higher pain scores (Table 1). In patients who underwent tonsillectomy, additional adenoid curettage did not significantly increase post-operative pain (adenoidectomy: mean 1.46±2.31 versus no adenoidectomy: mean 1.59±1.90, p=0.742). In adenoidectomy without tonsillectomy, performing concurrent myringotomy did not increased post-operative pain (myringotomy mean 0.88±1.32 versus no myringotomy mean 0.89±1.78, p=0.350). Of those undergoing tonsillectomy or adenoidectomy, performing concomitant turbinoplasty did not significantly altered post-operative pain scores (turbinoplasty mean 1.18±1.77 versus no turbinoplasty mean 1.37±1.93, p=0.430). In a linear regression model considering potential confounders, tonsillectomy intervention was the only significant predictor of post-operative pain (F(1.952)=12.041, p=0.001). Importantly, post-operative pain was not influenced by the surgical indication (recurrent infections, OSDB, effusion otitis media) (p>0.05). Likewise, a higher number of procedures within the same intervention per se did not associate with higher post-operative pain (p>0.05) as shown in Figure 1.

DISCUSSION

Pain is major concern in children, not just because of the emotional consequences to the child and family, but also due to the potential morbidity involved.[6] Besides the impact to the child, postoperative pain may also imply healthcare expenses, enhancing unplanned readmissions to hospital facilities after Pediatric ORL surgery.[7]

Giving that postoperative pain prolongs recovery and hospitalization, pain severity assessment should be routinized.[8] On the other hand, proper pain evaluation in the pediatric population may be a true challenge, due to inherent lack of understanding and sometimes verbalization of hurt.[6] There are no physical signs that constitute an absolute or specific indicator of pain, and its diagnosis must rely on physiological, behavioral and self-report methods.[6] Additionally, a satisfactory treatment of pediatric pain can be arduous due to a lack of clinical knowledge, insufficient pediatric research, and the reluctance for the usage of certain drugs.[6,9] Numerous studies have developed tools that would allow for an accurate assessment of the intensity of pain in children in the postoperative period. Nevertheless, there is no universal method for pain assessment which is appropriate for every pediatric patient.[8]

It is relatively well established that children experience significant pain for a considerable period following adenotonsillectomy. However, less is known about pain scores following other common Otorhinolaryngology interventions and pain outcomes after associating various procedures within the same operation.[7] Studies suggest that predicting post-operative pain is indispensable for preparing the child and parents and for ensuring accurate follow-up.[1] Nevertheless, there are very few works comparing the effect of different ORL procedures in pain outcomes in children. Our main objective was to provide the clinician with a measurement analysis of pain outcomes following different ORL procedures in children.

Our results show that the type of surgical indication (infections, OSDB, effusion otitis media) and the number of procedures within the same intervention do not seem to influence post-operative pain. On the other hand, performing tonsillectomy seems to be the most important influencer of postoperative pain in the Pediatric outpatient setting. This results are partially in line with previous research concluding that recovery varies with the type of surgery, although adenoidectomy did not significantly increased post-operative pain such as suggested in some works.[1,10] Our findings suggest that adenoidectomy and turbinoplasty do not relevantly influence post-operative pain, opposing to the work from Guntinas et al which states that nose surgery is very painful in children.[11] Contrarily, our findings are in agreement with some published studies which also refer to much higher pain in patients who performed adenotonsillectomy comparing to patients only performing adenoidectomy.[7,12] The work from Wilson et al, who also accounted for other common head and neck surgeries such as myringotomy, myringoplasty, strabismus and tongue tie divisions, found that adenotonsillectomy patients represent the biggest challenge in postoperative pain management of the head and neck surgeries evaluated.[7] These findings are in line with the ones here reported, since tonsillectomy was the most important determinant of postoperative pain. Importantly, performing turbinoplasty, myringotomy and adenoidectomy so as the absolute number of procedures did not influence post-operative pain in a significant degree, opposing to tonsillectomy. Hence, based on our results, waiving the association of procedures when clinically indicated in order to avoid postoperative pain does not seem reasonable.

A major limitation of the present study is its retrospective observational and single-center character. Additionally, only otherwise healthy children were addressed in an ambulatorial setting, and the same technique was used in all procedures, not allowing for the comparison of different techniques in pain outcomes. Also, the duration of each surgery was not registered, although being referred by Schnelle et al as a predictor of postoperative pain in a ORL Pediatric cohort.[13] Further studies would be pertinent addressing different surgical techniques or different pediatric populations.

CONCLUSION

To our knowledge, this is one of the few studies to compare pain outcomes following different common Pediatric ORL procedures, and the one with the largest sample size so far. Performing tonsillectomy seems to be the most important pain-eliciting determinant, opposing to the absolute number of procedures in the same operation, which did not influence post-operative pain per se. In order to maximize postoperative pain management, the clinician should know what to expect and medicate accordingly. Advising the family about the expected children´s degree of pain is fundamental for obtaining a good pain control at home and minimize readmissions. Proper advisement and analgesia prescribing on discharge should be tailored to the operation performed.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Verbeeck F, Hens G, Willem L. Postoperative recovery in children after outpatient ENT surgery. B-ENT. 2016;12(3):165-73.
2. Brasher C, Gafsous B, Dugue S. Postoperative pain management in children and infants: an update. Paediatr Drugs. 2014;16(2):129-40.
3. Wiggins SA, Foster RL. Pain after tonsillectomy and adenoidectomy: “ouch it did hurt bad”. Pain Manag

Nurs Off J Am Soc Pain Manag Nurses. 2007;8(4):156-65.
4. Muller RG, Thimmappa V, Sheyn A. Post-Operative pain control following Pediatric Otolaryngology Surgery. Madridge J Otorhinolaryngol. 2018;3(1):37-40.
5. Mitchell RB, Archer SM, Ishman SL. Clinical Practice Guideline: Tonsillectomy in Children (Update)-Executive Summary. Otolaryngol neck Surg Off J Am Acad Otolaryngol Neck Surg. 2019;160(2):187-205.
6. Rodríguez MC, Villamor P, Castillo T. Assessment and management of pain in pediatric otolaryngology. Int J Pediatr Otorhinolaryngol. 2016;90:138-49.
7. Wilson CA, Sommerfield D, Drake-Brockman TFE, von Bieberstein L, Ramgolam A, von Ungern-Sternberg BS. Pain after discharge following head and neck surgery in children. Paediatr Anaesth. 2016;26(10):992-1001.
8. Zieliński J, Morawska-Kochman M, Zatoński T. Pain assessment and management in children in the postoperative period: A review of the most commonly used postoperative pain assessment tools, new diagnostic methods and the latest guidelines for postoperative pain therapy in children. Adv Clin Exp Med Off organ Wroclaw Med Univ. 2020;29(3):365-74.
9. Adler AC, Mehta DK, Messner AH, Salemi JL, Chandrakantan A. Parental assessment of pain control following pediatric adenotonsillectomy: Do opioids make a difference? Int J Pediatr Otorhinolaryngol. 2020;134:110045.
10. Tuomilehto H, Kokki H, Ahonen R, Nuutinen J. Postoperative Behavioral Changes in Children After Adenoidectomy. Arch Otolaryngol Neck Surg. 2002;128(10):1159-64.
11. Guntinas-Lichius O, Volk GF, Geissler K, Komann M, Meissner W. Pain after pediatric otorhinolaryngologic surgery: a prospective multi-center trial. Eur Arch oto-rhino-laryngology Off J Eur Fed Oto-Rhino-Laryngological Soc Affil with Ger Soc Oto-Rhino-Laryngology - Head Neck Surg. 2014;271(7):2049-60.
12. Vons KMJ, Bijker JB, Verwijs EW, Majoor MHJM, de Graaff JC. Postoperative pain during the first week after adenoidectomy and guillotine adenotonsillectomy in children. Paediatr Anaesth. 2014;24(5):476-82.
13. Schnelle A, Volk GF, Finkensieper M, Meissner W, Guntinas-Lichius O. Postoperative pain assessment after pediatric otolaryngologic surgery. Pain Med. 2013;14(11):1786-96.

Cite this article as: de Sousa FA, Casanova MJ, Pinto AN, Coutinho MB, Sousa CA. Pediatric otolaryngology: influence of ambulatorial surgical procedures on postoperative pain. Int J Otorhinolaryngol Head Neck Surg 2021;7:1847-50.