

Comparison of Effectiveness of Intravenous Paracetamol and Tramadol For Post Adenotonsillectomy In Children

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ABSTRACT

Objective To compare the effectiveness of intravenous paracetamol and tramadol for post adenotonsillectomy in children when given as a single bolus dose.

Study design Randomized controlled trial.

Place & Duration of study Department of Anesthesiology, Surgical ICU and Pain Management, Dr. Ruth K M Pfau Civil Hospital Karachi (CHK), from November 2017 to April 2018.

Methodology Patients operated electively for adenotonsillectomy between the age of 6 years to 18 years were included in this study. They were randomly allocated into two groups. In group A patients were treated with intravenous paracetamol 15 mg/kg, 15 minutes after induction of general anesthesia. In group B intravenous tramadol 1 mg/kg was given 15 minutes after the induction of general anesthesia. At the end of surgery patients were extubated and transferred to recovery room and monitored. All patients received 4 - 5 liter/minute oxygen via a face mask. After two hours of analgesia dose, postoperative pain was assessed with the help of VAS (Visual Analogue Score).

Results A total of 60 patients were included, with 30 patients in each group. The mean age of the patients in group A was 12.97±3.39 year and group B 12.80±3.19 year. There were 31(51.7%) males and 29 (48.3%) females. Pain relief was significantly high in group B as compared to group A (86.7% vs. 56.7% - p=0.010).

Conclusion Intravenous tramadol was better than intravenous paracetamol for postoperative analgesia after adenotonsillectomy in children.

Key words Adenotonsillectomy, Paracetamol, Tramadol, Postoperative analgesia, Analgesia- children.

INTRODUCTION:

Tonsillectomy is the one of the commonest operative procedure amongst otolaryngologists which is performed usually as an outpatient procedure.¹ Annually, approximately 7900 more than 500 000

procedures are performed in Finland and USA respectively.²⁻⁵ Pain relief after surgeries with an appropriate analgesic is a crucial issue for patients and anesthesiologists.

Sarny et al reported that patients who suffer significant pain in the first few days after tonsillectomy have a higher risk of hemorrhage.⁶ This surgery is usually accompanied by adverse effects like nausea and vomiting, bleeding, and postoperative pain. Failure to control pain, can be a serious calamity in children ultimately resulting in prolonged period of recovery, leading to prolonged hospitalization.⁷

Nonsteroidal anti-inflammatory drugs (NSAIDs) have a significant role in decreasing postoperative pain, along with decreasing chances of postoperative

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nausea and vomiting (PONV). However, it causes increased chances of bleeding. On the other hand, opioids successfully help in achieving postoperative analgesia but it causes prolonged sedation which can delay hospital discharge.

Tramadol hydrochloride is a centrally acting analgesic agent available in oral, intramuscular, and intravenous formulation. The role of tramadol in relieving post-tonsillectomy pain has significantly been highlighted.⁸ Paracetamol being a non-opioid analgesic has analgesic action which is known to be caused by its action on serotonergic receptors. It also has a major antipyretic action by inhibiting the cyclooxygenase-3 at the level of hypothalamus.

There are some studies which compared the effectiveness of morphine, lidocaine and ketamine for treating post-tonsillectomy pain control.⁹ Alwan et al compared post-tonsillectomy pain in patients of age group 10 years - 30 years, and observed good analgesic response in group receiving 8 hourly I/V tramadol (85%) with that of 4-6 hourly I/V paracetamol (40%).¹⁰ The rationale of this study was to compare the analgesic effect of IV paracetamol with that of tramadol after adenotonsillectomy when given in single bolus dose.

METHODOLOGY:

This was a randomized controlled trial for which Ethical review committee permission was taken before conducting this study in the Department of Anesthesiology, Surgical ICU and Pain Management, Dr. Ruth K M Pfau Civil Hospital Karachi (CHK) over a period of 6 months from November 2017 to April 2018. Informed and written consent was taken from patients / guardians and they were explained about the potential risks and benefits of the study. The sample size was calculated by using WHO calculator. Tramadol response rate (85%)¹⁰ while paracetamol response rate (40%) with confidence interval 95% and Power of 80% a sample size came out to be 14 patients in each group. For this study 30 patients were enrolled in each group.

Patients of age 6 years to 18 years, of either gender, with ASA physical status I or II and diagnosed cases of elective adenotonsillectomy were included. Identified patients of allergy to studied drugs and history of any known congenital disease were excluded. On arrival in the operation theatre, all children had an already placed intravenous cannula. During the surgery, the patients were monitored through electrocardiography, pulse oximetry, capnography, non-invasive blood pressure measurement, and precordial stethoscope. At the

time of induction of anesthesia fentanyl (0.1 mcg/kg) and dexamethasone (0.1 mg/kg) were given followed by propofol (2 mg/kg) and atracurium (0.5 mg/kg). Following successful intubation, anesthesia was maintained by isoflurane.

Patients were randomly divided into two groups. Group A: received intravenous paracetamol 15 mg per kg, 15 minutes after the induction of anesthesia. Group B: received intravenous tramadol 1 mg per kg, 15 minutes after the induction of anesthesia. After the surgical procedure and successful extubation, patients were transferred to recovery room where they were monitored through ECG, pulse oximeter and non-invasive blood pressure measurement. After two hours of analgesia dose, postoperative pain was assessed by visual analogue score. VAS <30mm was labeled as effective.

Data analysis was done using SPSS 21. Mean and standard deviation was calculated for all quantitative variables like age, weight, height, VAS score. Relevant description, percentages and frequencies were calculated for variables like gender, ASA status and effectiveness. Chi square test was run to compare the effectiveness between two groups. The data was stratified in order to control modifiers like age, gender, weight, height and ASA status. Post stratification chi-square test was applied. P = 0.05 was taken as significant.

RESULTS:

A total of 60 patients were included. The mean age of the patients in group A was 12.97±3.39 year and in group B 12.80±3.19 year. Mean weight and height of the children are given in table I. Among the included cases, 31 (51.7%) were males and 29 (48.3%) females. Pain control was significantly high in group B in comparison to group A (86.7% vs. 56.7% - p=0.010). This is shown in table II. After stratification of age groups, it was observed that effectiveness was significantly high in group B in comparison to group A for below and equal to 10 years of age children (table III). In relation to gender pain control was superior in females which was significant. Weight was not found significant between groups. Effectiveness was found to be significantly high in group B in comparison to group A (92.9% vs. 61.5% - p=0.050) for below and equal to 100 cm height of children. Similarly ASA status was also stratified and found insignificant.

DISCUSSION:

Pain is an expected element of a surgical procedure, and unfortunately pain following surgery is frequently not addressed effectively. This may result

Table I: Demographic Characteristics and Pain Score Among Groups

| Variables | Group A n=30 | | Group B n=30 | |
|-------------|--------------|--------------------|--------------|--------------------|
| | Mean | Standard Deviation | Mean | Standard Deviation |
| Age (Year) | 12.97 | 3.39 | 12.80 | 3.19 |
| Weight (kg) | 32.47 | 6.85 | 32.87 | 8.26 |
| Height (cm) | 106.47 | 20.44 | 88.83 | 42.47 |
| Pain | 27.00 | 12.90 | 19.33 | 7.84 |

Table II: Effectiveness of Intravenous Paracetamol and Tramadol For Postoperative Pain

| Effective | Group A n=30 | Group B n=30 | Total | P-Value |
|-----------|--------------|--------------|-------|---------|
| Positive | 17 (56.7%) | 26 (86.7%) | 43 | 0.010 |
| Negative | 13 (43.3%) | 4 (13.3%) | 17 | |

Chi-Square= 6.648

Table III: Effectiveness of Intravenous Paracetamol and Tramadol For Post Adenotonsillectomy In Children When Given As A Single Bolus Dose For \geq 10 Years of Age

| Effective | Group A n=11 | Group B n=10 | Total | P-Value |
|-----------|--------------|--------------|-------|---------|
| Positive | 7 (63.6%) | 10 (100%) | 17 | 0.034 |
| Negative | 4 (36.4%) | 0 (0%) | 4 | |

Chi-Square= 4.49

in suffering and ultimately in multiple physiological and psychological complications. This also increases duration of hospitalization. In order to achieve successful recovery from surgery, managing postoperative pain is important.¹¹ Postoperative pain can cause significant debilitation on the part of the patient in major surgeries like laparotomy.¹² Amongst the list of surgeries in children, adenotonsillectomy is fairly a common procedure.

For the many years now, giving opioids and nonsteroidal anti-inflammatory drugs (NSAIDs) is a common practice to treat pain, but along with analgesic benefits they can cause side effects related to respiratory, gastrointestinal and renal systems.¹³ Paracetamol is a useful analgesic drug.¹⁴ IV paracetamol is widely used as a primary treatment of choice for pain and fever among adults and children. Paracetamol has an advantage over NSAIDs that it does not interfere with platelet and kidney functions and have extremely rare side effects.¹⁵

Tonsillectomy is usually done among children of age 3 years -14 years.¹⁶ Adenoidectomy is done more commonly in males whereas tonsillectomy is more often performed in the females.¹⁷ In this study more males had tonsillectomy in comparison with females.

Satisfactory pain control was noticed after adenotonsillectomy in children in group B in comparison to group A. In some studies IV paracetamol was found effective in controlling pain after tonsillectomy in children. Pendeville et al showed that when IV paracetamol is given at a dose of 30mg/kg before surgical incision, better results were obtained than tramadol given at a dose of 3mg/kg.¹⁸ Alhashemi and Daghistani compared IV paracetamol at 15 mg/kg and IM meperidine 1 mg/kg which showed similar post analgesic effects in children undergoing tonsillectomy.¹⁹ We used comparatively small dose of paracetamol in this study. Tramadol remained effective in providing better pain control after surgery.

CONCLUSIONS:

Tramadol yields better results than intravenous paracetamol in postoperative analgesia after adenotonsillectomy in children. Tramadol can be recommended as an effective method of postoperative analgesia after adenotonsillectomy,

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Muhammad Imran Khan: Drafting & revision of critical content.

Syed Farjad Sultan: Accountable for all aspects of work & accountability and accuracy of study.

Safia Zafar Siddiqui: Final approval of manuscript.

Conflict of Interest:

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