

## Preemptive analgesic with paracetamol and tramadol analgesics in pediatric circumcision

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### ABSTRACT

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**Background:** Circumcision is the most widely minor surgery in the world, whether done by doctors, paramedics, or by traditional. Circumcision that removes part or all of the penis prepuce with the aim of removing smegma (dirt). Society circumcised their children at the age of 5-12 years. Analgesics may be given to patients, for instance, paracetamol, non-steroidal anti-inflammatory drug (NSAIDs) such as aspirin and opioid groups such as tramadol.

**Objective:** The aim of this study was to compare the effectiveness of paracetamol analgesics and tramadol in circumcised patients given prior to the act of circumcision.

**Methods:** This study was a quasi-experimental study to determine different analgesic effects of paracetamol and tramadol administration, prior to circumcision. The subjects of this study are children aged 5-12 years as many as 36 children, which is divided into 2 groups of paracetamol and tramadol group. One hour before circumcision, subjects were given group-appropriate analgesics, then the visual analog scale (VAS) was measured 1 hour after circumcision. The data obtained were made into percentage on the scale of VAS <5 and > 5.

**Results:** In the paracetamol group, there were 5 children (27.8%) with VAS 1-3 (mild pain), 13 children (72.2%) with moderate pain (VAS value 4-7). In the tramadol group, there were 15 children (83.3%) with mild pain (VAS score 1-3), and the remaining 3 children (16.7%) had moderate pain. No side effects of both analgesic drugs were found.

**Conclusion:** Patients with mild pain complaints were more likely found in the tramadol group than in paracetamol group. Tramadol gave stronger preemptive analgesic results in circumcision compared to paracetamol.

**Latar Belakang:** Sirkumsisi atau sunat adalah tindakan pengangkatan sebagian/ seluruh preputium penis dengan tujuan menghilangkan smegma (kotoran). Tindakan ini merupakan tindakan bedah minor yang paling banyak dikerjakan di seluruh dunia, baik dikerjakan oleh dokter, paramedis, ataupun ahli sunat. Masyarakat menyunatkan anaknya pada usia antara 5-12 tahun. Analgetika yang dapat diberikan pada pasien dengan sirkumsisi yaitu golongan non-steroidal anti-inflammation drug (NSAID) seperti parasetamol dan golongan opioid seperti tramadol.

**Tujuan:** Penelitian ini bertujuan untuk membandingkan antara efek analgesik parasetamol dengan efek analgesik tramadol pada pasien sirkumsisi yang diberikan sebelum dilakukan tindakan sirkumsisi (preemptive analgesia).

**Metode:** Penelitian ini merupakan penelitian quasi eksperimental untuk mengetahui pengaruh perbedaan.

36 anak berusia 5-12 tahun yang terbagi menjadi 2 kelompok yaitu kelompok yang diberikan analgesik parasetamol dan kelompok yang diberikan analgesik tramadol. Analgetika diberikan satu jam sebelum sirkumsisi. Efek analgesik diukur dengan menggunakan skala VAS 1 jam setelah sirkumsisi. Data yang diperoleh kemudian dibuat persentase skala VAS < 5 dan > 5.

**Hasil:** Pada kelompok parasetamol, terdapat 5 anak (27,8%) dengan nilai VAS 1-3 (nyeri ringan), 13 anak (72,2%) nyeri sedang (nilai VAS 4-7). Pada kelompok tramadol, terdapat 15 anak (83,3%) dengan nyeri ringan (nilai VAS 1-3), dan sisanya sebanyak 3 anak (16,7%) nyeri sedang. Tidak ditemukan efek samping dari kedua jenis obat analgetik.

**Kesimpulan:** Pasien dengan keluhan nyeri ringan lebih banyak pada kelompok tramadol dibandingkan parasetamol. Dengan demikian tramadol memberikan hasil analgetika yang lebih kuat pada nyeri sirkumsisi dibandingkan dengan parasetamol.

## INTRODUCTION

Circumcision is the act of removing part/ all of the penis prepuce so that the penile gland is exposed. This is the most widely performed minor surgical procedure in the world, whether done by doctors, paramedics or by traditional circumcision. There have been several studies shown that circumcision have various health benefits, including preventing deadly diseases such as acquired immunodeficiency syndrome (AIDS) and cancer.<sup>1</sup>

Medically, circumcision is very beneficial because it improves the cleanliness of the penis. Preputium can be a gathering place for urine residues and other impurities that will form a white substance called smegma. Smegma is a potential source of infection. Disposed prepuce skins can reduce the risk of infection and other diseases.<sup>2</sup>

Circumcision can cause pain due to inflammation. Inflammation is a localized tissue reaction to an infection or injury involving multiple mediators. Inflammation is a physiological response and is one of the non-specific immune response. Inflammation is caused by the release of various mediators

derived from damaged tissue, mast cells, leucocytes, and complement. These mediators lead to the appearance of various physical signs of inflammation ie heat, dolor, rubor, tumor, and functio laesa.<sup>3</sup> According to The International Association for the Study of Pain (IASP), pain is defined as an unpleasant sensory and emotional experience associated with tissue damage or potentials that will result in tissue damage.<sup>4</sup>

Analgesic drugs act in various way in the peripheral and central nervous system. The nonsteroidal anti-inflammatory drugs (NSAIDs) act in the peripheral nervous system by inhibiting the release of mediators so that the activity of cyclooxygenase enzyme is inhibited and prostaglandin synthesis does not occur. Opioid exerts its analgetic effects at the central nervous system by occupying the receptors in the dorsal horn of the spinal cord, hence the inhibition of transmitter discharge and excitation to the spinal nerve does not occur.<sup>5</sup> In this study, the drug used is tramadol which is included in an opioid and paracetamol or acetaminophen, which is a metabolite of fenasetin (artificial paraaminophenol). Both of these drugs have analgesic and antipyretic effects.<sup>6</sup> Paracetamol works by inhibiting cyclooxygenase enzyme which results in inhibiting prostaglandin synthesis.<sup>7</sup>

When there is a tissue damage various mediators such as algesic substances, cytokines, and cellular products including eicosanoid metabolites, free radicals, and others are released and promote ongoing pain or pain hypersensitivity against mechanical, thermal and chemical stimuli. These mediators result in inflammation through prostaglandin synthesis.<sup>8</sup> There are four processes that follow a process of nociception or pain relief, which are transduction, transmission, modulation and perception.<sup>9</sup>

A study comparing the administration of tramadol and paracetamol prior to circumcision pain has not been performed. The aim of this study was to compare the analgesic effects of paracetamol and tramadol given before circumcision. Previous studies have compared the administration of tramadol and paracetamol

in adenotonsillar surgery patients with equally effective results.<sup>10</sup>

**METHODS**

This research has been approved by the research ethics committee of the Faculty of Medicine and Health Sciences of Muhammadiyah University of Yogyakarta. This study involved 36 subjects who follow circumcision in private hospitals in Sleman who meet the criteria. The inclusion criteria of this study are children aged 5-12 years, willing to be the subject of research with the permission of parent/ guardian, the penis must be in normal circumstances without any abnormalities. Exclusion criteria of this study are the presence of local infections, hemophilia, history of drug allergy, non-cooperative patients, and patients with penile disorders.

The dosage used in this study are as follow : paracetamol 10 mg/kg BW and tramadol 2 mg/kg BW. Drugs were administered one hour prior to circumcision. The intensity of the pain was measured based on visual analog scale (VAS) one-hour post-procedure. VAS measurement was done subjectively by patients, in which they would point out the number from 0 (no pain) to 10 (extremely painful). Side effects that occur after paracetamol and tramadol administration, for instance, nausea, vomiting, or allergic reaction, was documented. Data were statistically analyzed using Chi-square test with  $p < 0,05$

**RESULTS**

This study consisted of two intervention groups, each group involved 18 children. Group one is a group given paracetamol before circumcision while group two is a group given tramadol before circumcision. Observation of

pain intensity was performed after circumcision in each group.

Based on the data of average VAS values, it was found that the paracetamol pre circumcision group had the VAS value of the mild pain category 27.8% and the moderate pain category 72.25%, the tramadol group had mild pain 83.3% and the moderate pain was 16.7%. There was no severe pain in both groups (Table 1). The results showed that the use of tramadol was better than paracetamol to reduce pain ( $p < 0.001$ ).

**DISCUSSION**

Paracetamol is an NSAIDs-class analgesic that acts by inhibiting the formation of prostaglandins, whereas tramadol is an opioid-type analgesic that acts directly to the opioid receptors.<sup>11</sup> World Health Organization (WHO) Ladder for Pain shows that paracetamol is used in mild to moderate pain, while tramadol is used in the second line after paracetamol.<sup>12</sup> Viitanen and Annilla (2001) used tramadol as a postoperative adenoidectomy analgetics in children, with a dose of 2 mg/kg BW with better results than placebo, and no side effects were found.<sup>13</sup> Makkar et al. (2015) in his study stated that intravenous administration of paracetamol is as effective as intramuscular tramadol.<sup>14</sup> The results of the review indicate that there is no analgesic that completely eliminates pain. However, a combination of pharmacologic and nonpharmacologic interventions is the best analgesic choice, especially when anesthesia by blocking the dorsal nerves of the penis is combined with other treatments.<sup>15</sup>

**CONCLUSION**

Tramadol administration prior to circumcision (preemptive) results in better pain-relieve when

Table 1. Pain intensity in paracetamol and tramadol group based on VAS

Group	Mild pain n (%)	Moderate n (%)	Severe pain n (%)	p
Paracetamol	5 (27,8)	13 (72,25)	0 (0)	0,001
Tramadol	15 (83,3)	3 (16,7)	0 (0)	

compare to paracetamol.

Further studies are needed to compare other analgesic drugs.

### CONFLICT OF INTEREST

We declare there is no conflict of interest

### ACKNOWLEDGEMENT

Non declare

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