

EVALUATION OF PAIN SCALE ON CIRCUMCISION PATIENTS UNDER LIDOCAINE HYDROCHLORIDE LOCAL ANESTHESIA

¹ Baraz Aulia A, ² Citra Manela, ³ Yevri Zulfiqar, ⁴ Hendriati, ⁵ Rinal Effendi, ³ Etriyel Myh.

¹ Medical Study Program, Faculty of Medicine/Andalas University, Padang.

² Department of Forensic and Medicolegal, Faculty of Medicine/Andalas University, M Djamil Hospital, Padang.

³ Division of Urology, Department of Surgery, Faculty of Medicine/Andalas University, M Djamil Hospital, Padang.

⁴ Department of Ophthalmology, Faculty of Medicine/Andalas University, M Djamil Hospital, Padang.

⁵ Department of Anesthesiology, Faculty of Medicine/Andalas University, M Djamil Hospital, Padang.

ABSTRACT

Objective: Evaluating the pain scale of circumcision patients under lidocaine hydrochloride local anesthesia. **Material & Methods:** An observational descriptive research was carried out on 30 children with a body weight of 20-29 kilograms from February 2023-April 2023. Circumcision was performed under 2 ampoules of 2% lidocaine as local anesthesia. Data consisted of pain onset measure using a stopwatch and the pain scale were obtained through the Wong-Baker Face Pain Rating Scale (WBFPRS), these variables were recorded when pain occurs post-local anesthesia effects ends. **Results:** The average onset of pain is 47.73 minutes with the fastest onset of pain was 20 minutes and the longest onset of pain was 72 minutes. The average pain scale as measured by the WBFPRS is 2.33. **Conclusion:** The average pain scale in this study was less than 3 which indicated that the pain felt did not interfere with activities.

Keywords: Circumcision, pain, anesthesia, lidocaine.

ABSTRAK

Tujuan: Mengevaluasi skala nyeri pasien sirkumsisi dengan anestesia lokal menggunakan lidokain hidroklorida. **Bahan & Cara:** Jenis penelitian ini adalah deskriptif observasional yang dilaksanakan pada 30 anak dengan berat badan 20-29 kg dari Februari 2023-April 2023. Sirkumsisi dilakukan dengan pemberian 2 ampul lidokain 2%. Variable pada penelitian ini yaitu waktu timbulnya nyeri dengan menggunakan stopwatch dan mengukur skala nyeri dengan menggunakan Wong-Baker Face Pain Rating Scale (WBFPRS) yang dicatat ketika nyeri timbul setelah anestesia lokal berakhir. **Hasil:** Rerata waktu timbul nyeri adalah 47.73 menit dengan waktu timbul nyeri tercepat adalah 20 menit dan waktu timbul nyeri terlama adalah 72 menit. Rerata skala nyeri yang diukur dengan WBFPRS adalah 2.33. **Simpulan:** Rata-rata skala nyeri pada penelitian ini adalah kurang dari 3 yang menunjukkan bahwa nyeri yang dirasakan itu tidak mengganggu aktivitas.

Kata Kunci: Sirkumsisi, nyeri, anestesia, lidokain.

Correspondence: Etriyel Myh; c/o: Division of Urology, Department of Surgery, Faculty of Medicine/Andalas University, M Djamil Hospital. Jl. Perintis Kemerdekaan, Padang 25127, Indonesia. Mobile Phone: 081266589187, Fax: +62075137030. Email: etriyelmyh@yahoo.com.

INTRODUCTION

Pain is an unpleasant sensation complaint by many patients. The sensation experienced by each person certainly varies in length and severity. Circumcision performed without anesthesia can cause pain during the circumcision procedure. Therefore, pain management is an important part of circumcision.¹ This procedure is carried out for medical purposes, cultural value, and belief. Circumcision is a minor surgical procedure that often performed in the world.²⁻³ The global prevalence of

male circumcision is around 38.7%. Most circumcision performed in Central Asia and Muslim-majority countries in Asia, such as Bangladesh, Pakistan and Indonesia. Likewise, on the African continent, circumcision performed in many countries and at least in South Africa. The percentage of male circumcision in Indonesia is 92.5%.⁴

Administration of local anesthesia is a very important step in the circumcision procedure. Local anesthesia is an option because it is cheaper and safer than general anesthesia. The technique commonly

used to provide local anesthesia in the penis is the dorsal nerve block technique.⁵ With this technique, lidocaine injected into the proximal part of the penis. This dorsal nerve block technique is also more effective in relieving pain than the block technique with topical administration.⁶

Pain sensation, crying, agitation, and physiological stress during circumcision in children reduced by local anesthesia with the dorsal penile nerve block technique. Circumcision with the dorsal penile nerve block technique in children can prevent an increase in pulse rate, blood pressure, the hormone cortisol, and prevent a decrease in oxygen saturation.⁶

Lidocaine is a local anesthetic drug of the amide class, often used in circumcision procedures. The onset of lidocaine is 3 minutes and the duration of action is 60-120 minutes.⁷ The duration of action and the maximum dose of lidocaine may be increased if epinephrine is added. The maximum dose of lidocaine is 5 mg/kilograms. If the patient is given this drug at a dose that is more than the maximum dose, toxicity to the nervous and cardiovascular systems may occur.⁷

OBJECTIVE

This study aims to evaluate the pain scale of circumcision patients under lidocaine hydrochloride local anesthesia.

MATERIAL&METHODS

An observational descriptive research, a research sample who were circumcision patient under lidocaine hydrochloride local anesthesia. This study was conducted from February 2023 to April 2023. The sample in this study were 30 children with a body weight of 20-29 kilograms coming from Dzikir Qalbu Circumcision Clinic in Padang, Indonesia. Circumcision performed using the dorsal slit method by administering two ampoules of 2% lidocaine. Lidocaine anesthesia administered by injection at the proximal part of the penis.

Data used in this study were primary data, pain onset and pain scale in children who underwent circumcision.

Pain onset was record using a stopwatch. The subject will be inject lidocaine before the circumcision performed. After that, the preputium will be clamp with clamps to check the effect of anesthesia. If the patient does not feel pain when the

preputium clamped, then the lidocaine has worked and the stopwatch can be start. When, the subject feels pain, the researcher will stop the stopwatch and measure the pain scale using the WBFPRS.⁸

WBFPRS is the pain scale that shows a type of faces ranging from a happy face at 0, which represents "no hurt", to a sad face at 5, which represents "hurts worst". The researcher will observe the facial expressions of subjects who are experiencing pain and will adjust it to WBFPRS.⁸



Figure 1. Wong-Baker faces pain rating scale.

In the results of the study, pain onset was divided into 2 groups, < 60 minutes and ≥ 60 minutes. The pain scale is divided into 2 groups, < 3 and ≥ 3.

The data will be processed in several stages, editing, coding, entry, and cleaning. The data that has been collected will be described as mean, frequency and percentage for each group in a table. The average onset of pain and pain scale will be presented in a table.

RESULTS

In this study, there were 30 subjects who met the inclusion criteria and circumcision was carried out smoothly without any problems so that none of the samples dropped out. Circumcision performed at Dzikir Qalbu Circumcision Clinic from February 2023 to April 2023.

Table 1. Distribution of circumcision patients by pain onset categories.

Pain Onset	Frequency	(%)
< 60 minutes	20	67
≥ 60 minutes	10	33
Total	30	100
Mean = 47.73 minutes		

Table 1 shows that the majority of circumcision patients felt pain within <60 minutes, which was 20 patients (67%). The average onset of

pain in 30 patients was 47.73 minutes. 1 patient felt pain with the fastest time, which was 20 minutes and 1 patient felt pain with the longest time, which was 72 minutes.

Table 2. Distribution of circumcision patients by pain scale (wbfprs) categories.

Pain Scale	Frequency	Percentage (%)
WBFPRS < 3	17	57
WBFPRS ≥ 3	13	43
Total	30	100
Mean = 2.33		

Table 2 shows that most of the circumcision patients experienced pain that did not interfere with activities (WBFPRS <3), which was 17 patients (57%). The average pain scale as measured by the WBFPRS in 30 patients was 2.33. In 13 patients with WBFPRS ≥3, there were 2 patients with WBFPRS 5.

Table 3. Overview of the pain scale (WBFPRS) based on the average onset of pain.

Pain Scale	Frequency	(%)	The average onset of pain
< 3	17	57	51.82 minutes
≥ 3	13	43	42.38 minutes

Table 3 shows that 17 patients with WBFPRS <3, all felt pain after the circumcision was completed with an average onset of pain was 51.82. In 13 patients with WBFPRS ≥ 3, 5 patients felt pain while the circumcision was being performed and 8 patients felt pain after the circumcision was completed. The average onset of pain in 13 patients with WBFPRS ≥ 3 was 42.38 minutes.

DISCUSSION

The pain onset in this study is related to the duration of action of lidocaine. If the duration of the action of the lidocaine has stopped, then the pain will be felt by the subject and the pain onset will be recorded. In addition, the severity of pain and the pain onset in the subjects of this study were also influenced by several factors, genetic, cultural, psychological, and family factors.⁹

In terms of genetic factors, genetic polymorphisms affect the duration of action of

lidocaine and pain intensity. Differences in the metabolism of lidocaine among individuals are caused by genetic polymorphisms. The enzyme that functions to decompose the drug lidocaine is the CYP3A4 enzyme. The speed of elimination of lidocaine is influenced by the genetic polymorphism of the CYP3A4 enzyme which will also affect the duration of action of lidocaine.⁹

Cultural factors can also affect the duration of drug action and pain intensity. There are classifications of cultural responses to pain, namely stoic patients and emotive patients. Stoic patients are patients who do not verbally express the pain they feel. Emotive patients are patients who always express feelings of pain and always speak for help. Emotive patients behave like that because of fear and a feeling of wanting to be noticed.⁹

Pain severity and duration of drug action can also be influenced by psychological factors. A study conducted by Cronin showed that there is a link between psychological factors and their relationship to the pain felt by patients. This study shows that patients who are very anxious will have a higher pain scale and require greater amounts of analgesia given intramuscularly than patients who are not anxious.⁹ In addition to psychological factors, family factors also influence the patient's pain. Patients who receive psychological support from their families will have a lower pain scale than patients who are not accompanied by their families.⁹

The duration of action of anesthetic drugs is an important factor in surgical procedures. The duration of action of anesthetic drugs should be long to support the surgical procedure performed. The duration of drug action from lidocaine can be increased longer if epinephrine is added because the mechanism of action of epinephrine is constriction of blood vessels which will cause reduced tissue perfusion without significant ischemia.¹⁰

The pain scale in this study was assessed using the WBFPRS. WBFPRS is the choice because the sample is children, WBFPRS is effective in measuring pain scale in children aged 3-17 years.¹¹ In this study, the average pain scale was 2.33. Research conducted by Ibrahim, the average pain scale in the samples given 2% lidocaine was 2.61.¹¹ In Mittal's study, in the form of administering lidocaine to the sample, the average pain scale was 1.88.¹²

Pain that is felt after the circumcision has been completed can occur due to two things, the duration of action of the lidocaine has run out and the scars that arise as a result of the circumcision

procedure.¹³ Scars that arise as a result of the circumcision procedure can cause post-circumcision pain. The causes of pain in scars are blood vessel trauma, skin damage, and nerve damage. The risk of infection and impaired wound healing can occur due to hypoxia caused by several of these causes.¹⁴ If hypoxia continues, infection can occur due to decreased levels of leukocytes in the body. External stimulation of the wound, such as giving dressings, cleaning the wound and the presence of biochemical processes in the wound can cause nerve damage so that it can cause pain in the wound.¹⁴

CONCLUSION

Based on the results of this study, it can be concluded that the average onset of pain was 47.73 minutes. The average of pain scale assessed by WBFPRS is 2.33. The average of pain scale assessed by WBFPRS in this research is less than 3 indicating that the pain does not interfere with activities. Because of that, lidocaine is a drug that is often used as a local anesthetic in this circumcision procedure. In addition, this drug is inexpensive compared to other local anesthetic drugs. Pain that is felt when the circumcision has been completed can be overcome by giving an additional 1 ampoule of 2% lidocaine.

REFERENCES

- Rossi S, Buonocore G, Bellieni CV. Management of Pain in Newborn Circumcision: A Systematic Review. *Eur J Pediatr*. 2021;180(1): 13-20.
- Ferasinta, Wijaya AK. Pengaruh Metode Klem Terhadap Lama Hari Perawatan Pada Anak Yang Menjalani Sirkumsisi Di Poniran Khitan Center Bengkulu. *Pros Senantias*. 2020; 1(1): 171-178.
- Abdulwahab AA, Mungadi IA. Techniques of Male Circumcision. *J Surg Tech Case Rep*. 2013; 5(1): 1-7.
- Morris BJ, Wamai RG, Henebeng EB, et al. Estimation Of Country-Specific And Global Prevalence Of Male Circumcision. *Popul Health Metr*. 2016; 14(1): 4.
- WHO, Statistics Agency Z, Hellar A, et al. Circumcision Methods for Adolescent Boys and Men. *PLoS One*. 2015;22(8):1-6.
- Wang J, Zhao S, Luo L, et al. Dorsal Penile Nerve Block Versus Eutectic Mixture Of Local Anesthetics Cream For Pain Relief In Infants During Circumcision: A Meta-Analysis. *PLoS One*. 2018; 13(9): e0203439.
- Leung YL. Lidocaine. In: Wexler P, editor. *Encyclopedia of Toxicology*. 3rd ed. Academic Press; 2014.
- Sudhakar A. Pain Assessment Scale. In: *A Clinical Daily Diary of Child Health Nursing (Pediatric Nursing)*. 1st ed. Jaypee Brothers Medical; 2016.
- Fang P, Tang PF, Xu RA, Zheng X, Wen J, Bao SS, et al. Functional Assessment Of CYP3A4 Allelic Variants On Lidocaine Metabolism In Vitro. *Drug Des Devel Ther*. 2017;11:3503-10.
- Prasetyono TOH, Lestari PA. The Onset And Duration Of Action Of 0.2% Lidocaine In A One-Per-Mil Tumescant Solution For Hand Surgery. *Arch Plast Surg*. 2016; 43(3): 272-7.
- Ibrahim R, Naim M, Premtim R. Evaluation Of The Pain Scale During Arteriovenous Fistula Puncture With And Without Lidocaine Gel 2% In Patients Undergoing Haemodialysis In Kosovo. *Ann Med Surg*. 2022; 79: 103913.
- Mittal M, Sharma S, Kumar A, Chopra R, Srivastava D. Comparison of Anesthetic Efficacy of Articaine and Lidocaine During Primary Maxillary Molar Extractions in Children. *Pediatr Dent*. 2015; 37(7): 520-4.
- Al-Salem AH. *An Illustrated Guide to Pediatric Urology*. 1st ed. London: Springer; 2017.
- Frescos N. What Causes Wound Pain? *J Foot Ankle Res*. 2011;4.