ISSN No:-2456-2165

The Effect of a Single Dose of Dexamethasone Administration to Postoperative Pain and Nausea-Vomiting in Patients with Spinal Anesthesia

Andri Boy, Achsanuddin Hanafie, Dadik Wahyu Wijaya
Department of Anesthesiology and Intensive Care, Medical Faculty
North Sumatera University, Haji Adam Malik General Central Hospital
Medan, Indonesia

Abstract:-

- ***Introduction***

Dexamethasone is a glucocorticoid with few mineralocorticoid effects, which is commonly used perioperatively to reduce postoperative nausea and has a beneficial effect as postoperative analgesia.

- ***Objective***

This study aimed to effect the administration of a single dose of dexamethasone 2 ml (10 mg) to the incidence of postoperative pain and nausea in patients with spinal anesthesia.

- ***Method***

From the results obtained, the dexamethasone treatment group had the most VAS 3 values as many as 15 samples (41.7%) whereas in the placebo group there were at most VAS 3 and VAS 4 which were 15 samples (41.7%) and 15 samples (respectively). 41.7%). The dexamethasone treatment group had the most VAS 2 values as many as 14 samples (38.9%) whereas in the placebo group there were at most VAS 5 as many as 15 samples (41.7%). VAS values in the control group (0.9% NaCl) had a higher average value compared to the treatment group (Dexamethasone). In addition, in the control group there was an increase in the average VAS value which was slightly increased at T1 (6 hours postoperatively) and decreased after being given analgesic rescue (ketorolac 30 mg) because the VAS value was more than 4, so it decreased at T2 to T4 .

- ***Conclusions***

The effect of a single dose of dexamethasone 2 ml (10 mg) has an effect on the work of PONV with significant results, namely p = 0.007, which means it has a significant relationship.

Keywords:- *Dexamethasone, Visual Analogue Scale (VAS), Postoperative Nausea And Vomiting (PONV)*

I. INTRODUCTION

Neuraxial anesthesia is most often used for lower abdomen and lower extremities surgery. Spinal, epidural and spinal-epidural anesthetics can be used for many of the same surgical procedures. The difference in the selection of these anesthetic techniques is influenced by the particular procedure or condition of the patient.[1]

The use of neuraxial anesthesia increases dramatically. Spinal anesthesia has been shown to cause a "stress response" to surgery, reduce intraoperative blood loss, reduce the incidence of postoperative thromboembolism, and reduce morbidity and mortality in high-risk surgical patients. Neuraxial anesthetic techniques also have the advantage of reducing the risk of failed intubation, aspiration of gastric contents, avoiding the use of depressant agent drugs and having the ability to maintain patient awareness. Hyperbaric bupivacaine is the most commonly used agent for spinal anesthesia.[2]

Acute pain is a major cause of stress that triggers the response of neuroendocrine, immune and inflammatory responses (psycho-neuro-endocrine-immunological changes). This leads to an increase in certain hormone levels (stress), catabolism with tissue loss, immunosuppression, increased myocardial oxygen consumption due to tachycardia and increased cardiac output, increased risk of thromboembolism, vasoconstriction, decreased gastrointestinal motility, deterioration of pulmonary function and increased morbidity and mortality. Excessive stress is not only caused by the pain itself, but also by illness, injury, or surgical procedures. Thus, looking for the causes and symptomatic solutions is needed to reduce stress response and to be able to reduce morbidity and mortality.[3]

Postoperative pain is an example of cases of acute pain from both pathophysiology and a therapeutic point of view. Surgical procedures cause damage to local tissue, resulting in the release of prostaglandin, histamine, serotonin, bradykinin, P substances, and other mediators, the production of dangerous stimuli, irritation of free nerve endings and nociceptors (nociceptor pain). Bradykinin, serotonin, and histology are very sensitive and stimulate receptors, arachidonic acid metabolites are only sensitive to the above. Pain can also arise directly in the peripheral or central nerve structure, where the pain comes up during a

surgical procedure (neuropathic pain). Pain signals are transmitted by thin myelinated A-delta fibers and nonmyelinated C fibers from primary afferent neurons into the central nervous system. In the spinal cord, pain signals are modulated in a complicated way and some of these pain signals are transferred anteriorly and provoke segmental reflex responses. The others are passed upward through the spinothalamic and spinoreticular tracts, provoking suprasegmental and cortical responses. Autonomic nerves are also involved in the transfer of pain signals. Postoperative pain can originate from the skin, or from deeper somatic and visceral structures. It can be divided into somatic nociceptive (from the skin, muscles, bones), visceral nociceptive (from the thoracic and abdominal cavity organs), and neuropathic (caused by damage to nerve structures). Usually, this is a combination of several types of pain.[4]

Segmental reflexes cause increased tension and spasms of skeletal muscles, thereby increasing oxygen consumption in muscles and lactate production. Sympathetic neuron stimulation produces tachycardia, increased stroke volume, cardiac work, myocardial oxygen consumption, decreased gastrointestinal muscle tone and urinary system.[5]

The suprasegmental reflex further enhances the sympathetic nervous system and stimulates the hypothalamus and the hypothalamic-pituitary-adrenal axis, and also increases metabolic rate, especially catabolism and myocardial oxygen consumption.

Cortical responses are caused by the activation of complex systems related to integration and pain perception. Pain can be accompanied by a sense of worry and fear, which in turn stimulates the hypothalamus.

Postoperative nausea occurs in about 20% -30% of patients and becomes the second most common complaint often reported after the postoperative acute pain complaint.[6]

The efficacy of glucocorticoids to reduce pain and inflammation after surgery is being developed. Glucocorticoids are powerful anti-inflammatory agents, which can be used to control postoperative pain in a short period of time in various types of surgery. Dexamethasone also has antiemetic effects, in addition to anti-inflammatory and analgesic effects.[7]

The mechanism of action of glucocorticoids is not fully understood but is thought to be a theory related to inhibition of the production of inflammatory mediators (prostaglandin and bradykinin), preventing the reduction of pain thresholds that occur during surgery and reducing tissue swelling because it has anti-inflammatory effects and inhibits nerve compression by swollen tissue.[8]

Dexamethasone is a glucocorticoid with little mineralocorticoid effect, which is commonly used perioperatively to reduce postoperative nausea and has a beneficial effect as postoperative analgesia.[9]

Henzi et al[10] in 2000 examined dexamethasone as prevention of postoperative nausea. The most commonly used dexamethasone dosage regimen is 8 or 10 mg IV in adults, and 1 or 1.5 mg/kg IV in children. The test was comparing the dexamethasone with placebo in adults, where a dose of dexamethasone 8 or 10 mg, oral or IV gave statistically significant results that dexamethasone reduced the incidence of postoperative nausea and vomiting.[10]

Jeffrey et al[12] In 2013, the study of a prospective, randomized, double-blind, controlled showed that the addition of dexamethasone prophylaxis 10 mg IV is a comprehensive multimodal regimen in increasing antiemetic and analgesic control, increasing mobility, and shortening hospital care after total hip and knee arthroplasty. The dexamethasone 10 mg IV dose significantly improves postoperative pain and nausea-vomiting control.[11]

II. RESEARCH METHODOLOGY

A. Research Design

This study is an experimental study (true experimental study design), a double blind randomized control trial.

B. Place and Time of Research

This research was conducted at the Department of Anesthesiology and Intensive Therapy at the Faculty of Medicine, University of North Sumatra, Haji Adam Malik Central Hospital, Medan, and the time of the study started after ethical clearance was issued until the sample was fulfilled.

C. Population

The population was all patients who underwent elective surgery with spinal anesthesia at the Adam Malik Haji Central Hospital in Medan. Most of the population that meets the inclusion and exclusion criteria will represent the selected population by consecutive sampling until the number of samples is fulfilled.

- *Inclusion*

a. Willing to participate in the study.
b. 16-65 years old.
c. Physical status of ASA I-II.
d. Undergoing Lower limb surgery

- *Exclusion*

a. The patient refused to participate in the study.
b. Contraindications to spinal anesthesia.
c. Patients allergic to the drug that will be administered in the study

- *Drop Out Criteria*

a. Absence of motor or sensory block after the first injection.

b. Patients who will undergo lower limb surgery with spinal anesthesia> 2 hours

D. Sampling Method

Subjects who meet the criteria were recorded their name, age, medical record number, sex, address, telephone number and all clinical data related to this study. The researchers took all subjects that met the research criteria. Randomized patients were divided into two groups. Group A received 2 ml (10 mg) of dexamethasone iv and group B received 2 ml of normal saline (0.9%) based on the randomization process.

E. Procedure

The researchers took all subjects that met the research criteria. Patients were given an explanation of the things to be done and those who were willing to take part in the study filled out informed consent. Patients were undergoing surgery, where randomized patients were divided into two groups. Measuring and recording blood pressure, heart rate, breathing frequency, electrocardiography (EKG), oxygen saturation, mean arterial pressure (MAP) 5 minutes before spinal anesthesia were measured. All patients received hydration therapy followed by spinal anesthesia with 0.5% hyperbaric bupivacaine at L2-L3 or L3-L4 in sitting or lateral position. Group A received 2 ml of dexamethasone iv and group B received 2 ml of normal saline (0.9%) based on the randomization process. During the follow-up period of up to 24 hours after surgery, the mean arterial pressure (MAP), heart rate, breath frequency, pain and nausea-vomiting at T0, T1-6 hours, T2-12 hours, T3-18 hours, T4-24 hours was observed and recorded. Pain and nausea-vomiting rates were assessed based on the visual analog scale (VAS) measured using a 10-cm ruler according to patient reports. In this method, the patients were asked to show zero if they did not have the symptoms and ten if they have the most severe symptoms. For pain and nausea, a score of ≤4 is considered mild, 5-7 as moderate, and 8-10 as severe. To relieve the pain, patients could be given 75 mg of intramuscular diclofenac according to request and if deemed necessary (VAS> 4); the interval of diclofenac administration should not be <8 hours. As an antiemetic to treat postoperative nausea, patients could be given 10 mg metoclopramide i.v.

F. Data Analysis

After the data needed were collected, the completeness of the data was then checked again before the tabulation and processing. The research data were analyzed statistically with the help of the Windows SPSS-17 computer program (Statistical Product and Service Solution). Numerical data was displayed in the mean value ± SD (standard deviation) while categorical data was displayed in the % (percentage). Demographic data: numerical data normality test used T-independent test, normality test for categorical data used Chi-square test. The research hypothesis was tested using the Mann Whitney test. 95% confidence intervals with p values <0.05 were considered statistically significant.

III. RESULTS

A. The Characteristics of the Samples

The study was conducted for 2 months, January-February 2019 at the Haji Adam Malik Central Hospital Medan and the North Sumatra University Hospital. This study aims to determine the effect of a single dose of dexamethasone 2 ml (10 mg) on the incidence of postoperative pain, nausea, and vomiting in patients with spinal anesthesia.

The sample obtained in this study amounted to 72 samples that were in accordance with the inclusion and exclusion criteria, with 36 samples of the treatment group receiving a single dose of dexamethasone 2 ml (10 mg) and 36 samples in the placebo (0.9% NaCl) group as the control group. Sample characteristics are shown in Table 4.1.

Characteristics	**Treatment**				**Total**		**p *value***
	dexamethasone		**placebo**				
	n	**%**	**n**	**%**	**n**	**%**	
Sex							
Male	23	51,1	22	48,9	45	62,5	0.000
Female	13	48,1	14	51,9	27	37,5	
Age (mean±SD)	43.73±3.47		39.55±3.53				0.000
Type of surgery							
Orthopedic surgery	9	60,0	6	40,0	15	20,8	
General surgery	4	44,4	5	55,6	9	12,5	0.200
Digestive surgery	10	55,6	8	44,4	18	25,0	
Urology	7	36,8	12	63,2	19	26,4	
Gynecology	6	54,5	5	45,5	11	15,3	
ASA							
1	23	41,1	33	58,9	56	80,6	0.000
2	13	81,2	3	18,8	16	19,4	
Total	36	100.0%	36	100.0%	72	100.0%	

Table 1:- The Characteristics of the samples

ISSN No:-2456-2165

Table 1 shows the distribution of sample characteristics based on the treatment group. The sex, men in the dexamethasone group were 23 samples (51.1%) and in the placebo group were 22 samples (48.9%) while female in the dexamethasone group were 13 samples (48.1%) and in the placebo group were 14 samples (51.9%). From the results of statistical tests p value (0.000) <0.05, which means that there is a difference in the proportion of sex between the dexamethasone group and placebo group. Age, mean age in the dexamethasone group was 4.73 years old while in the placebo group was 5.55 years old. From the results of statistical tests p value (0.000) <0.05 which means there is a difference in the mean age between the dexamethasone group and placebo group.

The samples in this study were mostly from urological surgery patients with 19 samples (26.4%) followed by 18 digestive surgery patients (25.0%), while the least samples came from general surgery with 9 samples (12.5%). Patients in this study mostly had ASA 1 where the dexamethasone group were 23 samples (41.1%) and the placebo group were 33 samples (58.9%) while ASA 2 in the dexamethasone group were 13 samples (81.2%) and in the placebo group were 3 samples (18.8%). From the statistic test results p value (0.000)> 0.05 which means there is no difference in the proportion of ASA between dexamethasone and placebo groups.

B. Description of a Single dose of Dexamethasone 2 ml (10 mg) Administration to the Incidence of Pain

➢ *Comparison of the Incidence of Pain in Dexamethasone and Placebo Administration*

Comparison of the incidence of pain in a single dose of dexamethasone 2 ml (10 mg) administration on T1, T2, T3, and T4 shown in Figure 1

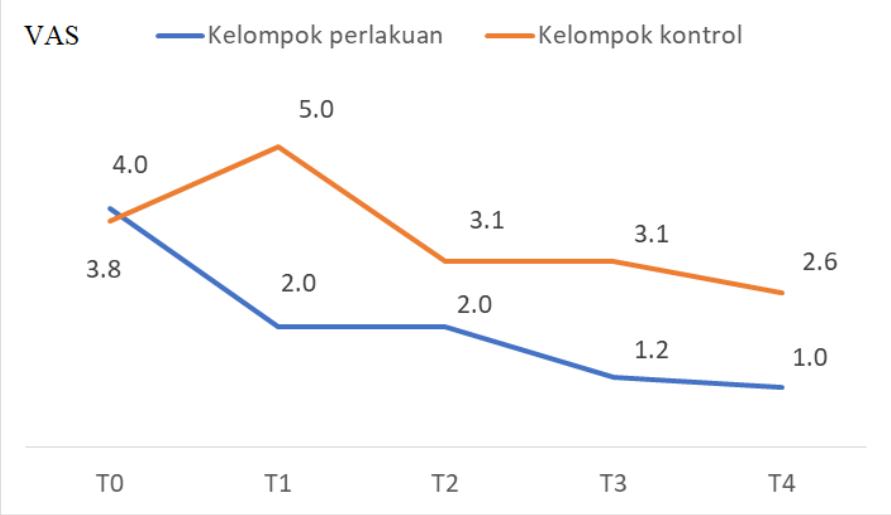

Fig 1:- Comparison of the incidence of pain in dexamethasone and placebo administration

Based on Figure 1, it can be seen that the VAS value in the control group (0.9% NaCl) has a higher mean value compared to the treatment group (Dexamethasone). In addition, in the control group, there was an increase in the mean VAS value which was slightly increased at T1 (6 hours postoperative) and decreased after being given analgesic rescue (ketorolac 30 mg) because the VAS value was more than 4, so it decreased at T2 to T4.

➢ *Effects of a single dose of dexamethasone 2 ml (10 mg) on the incidence of postoperative pain in patients with spinal anesthesia at T0*

Group	Mean±SD	Median	P value
dexamethasone	4.0±1.0	4	0.46
Placebo	3.7±0.7	4	
α value <0.05			

Table 2:- The effects of a single dose of dexamethasone 2 ml (10 mg) on the incidence of postoperative pain in patients with spinal anesthesia at T0

Based on Table 2 it was found that the mean VAS of the dexamethasone group at T0 was 4.0 and the placebo group was 3.7. there was no statistically significant difference in the VAS values in the dexamethasone and placebo groups at T0 observation.

➢ *Effects of a single dose of dexamethasone 2 ml (10 mg) on the incidence of postoperative pain in patients with spinal anesthesia at T1*

Group	Mean±SD	Median	P value
dexamethasone	2.0±0.8	2	0.000
Placebo	5.0±0.8	5	
α value <0.05			

Table 3:- The effects of a single dose of dexamethasone 2 ml (10 mg) on the incidence of postoperative pain in patients with spinal anesthesia at T1

Based on Table 3 it was found that the mean VAS of the dexamethasone group at T1 observation was 2.0 and the placebo group was 5.0. Statistically there were significant

ISSN No:-2456-2165

differences in VAS values in the dexamethasone and placebo groups in the T1 observation.

- *Effects of a single dose of dexamethasone 2 ml (10 mg) on the incidence of postoperative pain in patients with spinal anesthesia at T2*

Group	Mean±SD	Median	Nilai p
dexamethasone	2.0±0.8	2	0.000
Placebo	3.0±0.9	3	
α value <0.05			

Table 4:- The effects of a single dose of dexamethasone 2 ml (10 mg) on the incidence of postoperative pain in patients with spinal anesthesia at T2

Based on Table 4, it was found that the mean VAS of the dexamethasone group in the observation of T2 was 2.0 and the placebo group was 3.0. Statistically there were significant differences in VAS values in the dexamethasone and placebo groups in T2 observation.

- *Effects of a single dose of dexamethasone 2 ml (10 mg) on the incidence of postoperative pain in patients with spinal anesthesia at T3*

Group	Mean±SD	Median	Nilai p
dexamethasone	1.1±1.0	1	0.000
Placebo	3.0±0.9	3	
α value <0.05			

Table 5:- The effects of a single dose of dexamethasone 2 ml (10 mg) on the incidence of postoperative pain in patients with spinal anesthesia at T3

Based on Table 5, it was found that the mean VAS of the dexamethasone group in the T3 observation was 1.1 and the placebo group was 3.0. Statistically there were significant differences in VAS values in the dexamethasone and placebo groups in T3 observation.

- *Effects of a single dose of dexamethasone 2 ml (10 mg) on the incidence of postoperative pain in patients with spinal anesthesia at T4*

Group	Mean±SD	Median	Nilai p
dexamethasone	1.0±0.0	4	0.000
Placebo	2.5±0.5	3	
α value <0.05			

Table 6:- The effects of a single dose of dexamethasone 2 ml (10 mg) on the incidence of postoperative pain in patients with spinal anesthesia at T4

Based on Table 6, it was found that mean VAS of the dexamethasone group in the T4 observation was 1.0 and the placebo group was 2.5. Statistically, there were significant differences in VAS values in the dexamethasone and placebo groups in T4 observations.

- *Effects of a single dose of dexamethasone 2 ml (10 mg) administration to postoperative nausea and vomiting in patients with spinal anesthesia*

The comparison of the incidence of pain in a single dose of dexamethasone 2 ml (10 mg) at T1, T2, T3, and T4 is shown in Table 7

PONV		dexamethasone				Placebo			
		No nausea	nausea	vomiting once	vomiting > 3 times	No nausea	nausea	vomiting once	vomiting > 3 times
T1	n	32	4	0	0	28	5	1	2
	%	88.9%	11.1%	0.0%	0.0%	77.8%	13.9%	2.8%	5.6%
T2	n	36	0	0	0	28	5	1	2
	%	100.0%	0.0%	0.0%	0.0%	77.8%	13.9%	2.8%	5.6%
T3	n	36	0	0	0	28	5	1	2
	%	100.0%	0.0%	0.0%	0.0%	77.8%	13.9%	2.8%	5.6%
T4	n	36	0	0	0	28	5	1	2
	%	100.0%	0.0%	0.0%	0.0%	77.8%	13.9%	2.8%	5.6%

Table 7:- Description of the incidence of postoperative nausea and vomiting in patients with spinal anesthesia after the effect of administering a single dose of dexamethasone 2 ml (10 mg)

Based on Table 7, the PONV in the treatment group did not occur in 32 samples (88.9%) at T1, and in T2 the incidence of PONV was found. Only 4 samples (11.1%) in the treatment group experienced nausea. Whereas in the control group, samples that did not experience PONVI were 28 samples (77.8%), and the rest had PONV in the form of nausea, vomiting once, and vomiting more than 3 times, each of which were 5 samples (13.9%), 1 sample (2.8%) and 2 samples (5.6%)

➢ *The effects of a single dose of dexamethasone 2 ml (10 mg) on postoperative nausea and vomiting in patients with spinal anesthesia*

Group		PONV				P value
		T1	T2	T3	T4	
dexamethasone	Mean	0.11	0.00	0.00	0.00	0.007*
	SD	0.32	0.00	0.00	0.00	
placebo	Mean	0.36	0.36	0.36	0.36	-
	SD	0.80	0.80	0.80	0.80	

Table 8:- * Friedman test

Based on Table 8, it was found that administering a single dose of dexamethasone 2 ml (10 mg) had an effect on the incidence of PONV with significant results, p = 0.007, which means it has a significant relationship.

IV. DISCUSSION

This study was conducted to determine the effect of a single dose of dexamethasone 2 ml (10 mg) on the incidence of postoperative pain, nausea and vomiting in patients with spinal anesthesia. The use of dexamethasone 10 mg iv can improve pain control and can reduce the incidence of postoperative nausea and vomiting.

The incidence of pain at T0 (0 hours) in the treatment group mostly had the lower VAS score, which is VAS 3, compared to the placebo group which had the higher VAS score with VAS 4. The results of this study are in accordance with the study conducted by Erlangga et al (2015) that the administration of dexamethasone 10 mg as an adjuvant analgesic to postoperative pain showed a good effect to reduce the effects of pain.[1] The highest incidence of pain in T1 (6 hours) in the treatment group had a lower VAS score of VAS 2, compared to the group placebo that had VAS score of 5.

The incidence of pain at T2 (12 hours) in the treatment group mostly had a lower VAS score of 2, compared to the placebo group that had the VAS score of 3. It is in accordance with the theory that steroids reduce postoperative pain by reducing postoperative inflammation[2]. In a meta-analysis study, VAS scores that tend to fall until the pain disappears are effectively associated with dexamethasone administration [3,4], and the VAS score in the control group was significantly higher than in the dexamethasone group. In addition, another study found that systemic steroids effectively relieved postoperative pain for up to 48 hours, and serum CPR inflammatory factors controlled in the dexamethasone group during the study period [3,5]. This showed pain with the management of dexamethasone administration significantly associated with inflammation control.

The incidence of pain in T3 (18 hours) in the treatment group mostly had a lower VAS score of 1, while the placebo group mostly had a VAS score of 3. The incidence of pain at T4 (24 hours) in the treatment group all had a lower VAS score of 1, compared to the placebo group that mostly had the VAS score of 3. The result is in accordance with Fan et al's (2018) meta-analysis that dexamethasone reduced postoperative pain, the incidence of PONV, and total opioid consumption that effectively plays an important role in fast recovery. This meta-analysis study identified 8 studies that showed the dexamethasone group as more superior to the control group in reducing VAS values and consumption of opioids in 24 and decreasing the incidence of postoperative vomiting.[6]

Based on Figure 1 it can be seen that the VAS value in the control group (0.9% NaCl) has a higher mean value compared to the treatment group (Dexamethasone). This is in accordance with the literature that showed that pain occurs after surgery is nociceptive pain as a result of the inflammatory process.[7,8] Dexamethasone is a corticosteroid from the glucocorticoid group which has the strongest anti-inflammatory effect. The role of dexamethasone in inhibiting the synthesis of cyclooxygenation enzymes 1 and 2 will suppress the production of prostaglandins which function as inflammatory and pain mediators so that analgesic effects are formed.[9] According to another study, it was found that dexamethasone 8 mg preoperatively improved post-discharge quality of recovery in addition to reducing nausea, pain, and fatigue. The effect of Dexamethasone also depends on the dose for the quality of recovery.[40] At 24 hours, patients receiving dexamethasone 0.1 vs 0.05 mg/kg needed less opioid and reported less nausea, sore throat, muscle pain, and sleep difficulty.[41] Evaluation of the meta-analysis of analgesic effects depends on the dose of perioperative dexamethasone that dose> 0.1 mg/kg is effective in multimodal strategies to reduce pain and postoperative opioid consumption.[42,43] With this additional benefit of better pain relief and quality of recovery, prophylaxis of the dose of dexamethasone 0.1 mg/kg or 8 mg in adults can be considered although further confirmation is needed for larger doses.

The effect of a single dose of dexamethasone 2 ml (10 mg) has an effect on the incidence of PONV with significant results of p = 0.007, which means it has a significant relationship. This result is in accordance with Ho et al (2011) that the effect of administering dexamethasone as prevention of PONV has good results. These procedures include laparoscopic cholecystectomy, laparoscopic tubal ligation, hysterectomy, thyroidectomy, ear surgery, total knee replacement, tonsillectomy, and strabismus surgery.[10] In addition, in patients using epidural morphine for postoperative analgesia, the incidence of nausea and vomiting was around 40-60%. Several studies

have investigated the relative effectiveness of dexamethasone in reducing nausea and vomiting caused by epidural morphine. Dexamethasone has been shown to reduce the incidence rate by around 30-40%. In addition, another study found that intravenous dexamethasone 5 mg was as effective as 10 mg, the dose was as effective as 1.25 mg droperidol as a treatment for nausea and vomiting caused by epidural morphine.[10]

Another study in line with the results of this study is by Henzi et al10 in 2000 investigating dexamethasone as prevention of postoperative nausea and vomiting. The most commonly used dexamethasone dosage regimen was 8 or 10 mg IV in adults and 1 or 1.5 mg/kg IV in children. The test compared dexamethasone with placebo in adults, where a dose of dexamethasone 8 or 10 mg, orally or IV gave statistically significant results that dexamethasone reduced the incidence of postoperative nausea and vomiting.[10] Jeffrey et al[11] the study of a prospective, randomized, double-blind, controlled showed that the addition of dexamethasone prophylaxis 10 mg IV is a comprehensive multimodal regimen in increasing antiemetic and analgesic control, increasing mobility, and shortening hospital care after total hip and knee arthroplasty. The dexamethasone 10 mg IV dose significantly improves postoperative pain and nausea-vomiting control.[11]

V. CONCLUSIONS

- The VAS value in the control group (0.9% NaCl) has a higher mean value compared to the treatment group (Dexamethasone).
- An increase in the mean VAS value is slightly increased in the T1 (6 hours postoperative) control group and decreased after being given analgesic rescue (ketorolac 30 mg) due to a VAS value of more than 4, thus decreasing at T2 to T4.
- There is no significant relationship between VAS values between dexamethasone and placebo groups at T0 observation, but in observations T1, T2, T3, T4 there is a significant relationship with p value (0.000) <0.05.
- The administration of a single dose of dexamethasone 2 ml (10 mg) has an effect on the incidence of PONV with significant results of p = 0.007, which means it has a significant relationship.

SUGGESTIONS

- This study is expected to be the starting point for dexamethasone studies of postoperative pain and PONV with larger samples
- This study is expected to be an input for decision makers at the Haji Adam Malik Central Hospital in Medan to include dexamethasone as part of the operational standard of preoperative implementation services.

REFERENCES

[1]. Erlangga, M. E., Sitanggang, R. H. & Bisri, T. Perbandingan Pemberian Deksametason 10 mg dengan 15 mg Intravena sebagai Adjuvan Analgetik terhadap Skala Nyeri Pascabedah pada Pasien yang Dilakukan Radikal Mastektomi Termodifikasi. *2Jurnal Anestesi Perioper.* **3**, 146–54 (2015).
[2]. Kerr, D. R. & Kohan, L. Local infiltration analgesia: a technique for the control of acute postoperative pain following knee and hip surgery: A case study of 325 patients. *Acta Orthop.* **79**, 174–183 (2008).
[3]. Wang, C.-J. *et al.* Efficacy of perineural dexamethasone with ropivacaine in adductor canal block for post-operative analgesia in patients undergoing total knee arthroplasty: A randomized controlled trial. *Exp. Ther. Med.* **14**, 3942–3946 (2017).
[4]. Backes, J. R., Bentley, J. C., Politi, J. R. & Chambers, B. T. Dexamethasone Reduces Length of Hospitalization and Improves Postoperative Pain and Nausea After Total Joint Arthroplasty: A Prospective, Randomized Controlled Trial. *J. Arthroplasty* **28**, 11–17 (2013).
[5]. Ikeuchi, M. *et al.* Effects of dexamethasone on local infiltration analgesia in total knee arthroplasty: a randomized controlled trial. *Knee Surgery, Sport. Traumatol. Arthrosc.* **22**, 1638–1643 (2014).
[6]. Fan, Z. *et al.* The efficacy of dexamethasone reducing postoperative pain and emesis after total knee arthroplasty: A systematic review and meta-analysis. *Int. J. Surg.* **52**, 149–155 (2018).
[7]. Salerno, A. & Hermann, R. Efficacy and Safety of Steroid Use for Postoperative Pain Relief. *J. Bone Jt. Surg.* **88**, 1361–1372 (2006).
[8]. Hancı, V., Yurtlu, B. S., Domi, R., Shibata, Y. & Eyigör, C. Acute Postoperative Pain Control. *Pain Res. Manag.* **2017**, 7831014 (2017).
[9]. Vyvey, M. Steroids as pain relief adjuvants. *Can. Fam. Physician* **56**, 1295–7, e415 (2010).
[10]. Ho, C.-M., Wu, H.-L., Ho, S.-T. & Wang, J.-J. Dexamethasone prevents postoperative nausea and vomiting: Benefit versus risk. *Acta Anaesthesiol. Taiwanica* **49**, 100–104 (2011).