

Comparison of the Effects of the Use of Bupivacaine 0.5% Normal Saline with Bupivacaine Plus 0.5% Plus Dexamethasone on Postoperative Pain with Infraorbital Block Technique in Surgery Fess (Functional Endoscopic Sinus Surgery)

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Abstract:- Vasoconstrictor can be used to vasoconstriction blood vessels and reduce the amount of local anesthetic absorption into the blood circulation. This study aimed to assess the effect of the use bupivacaine difference plus 0.5% normal saline with 0.5% bupivacaine plus dexamethasone on postoperative pain with infraorbital block technique on fess surgery. This study uses a randomized controlled trial (double-blind) from February to July 2018 adam malik general hospital. The sampling technique is done by non-probability sampling by consecutive sampling method, amounting to 40 patients. Patients who have undergone surgery fess rated pain using the vas scale (score 0-10) and the need for extra analgesics in the first 24 hours. The results of this study, the 40 samples examined include male gender which men as much as 20 samples (50%) and female as many as 20 samples (50%). Assessment of pain at t0 found that the data was not statistically significant ($p > 0.05$). Assessment of pain in the t1 the data is not found to be statistically significant ($p > 0.05$). Assessment of pain in t2 was found that the data was not statistically significant ($p > 0.05$). Assessment of pain in t3 was found that the data was not statistically significant ($p > 0.05$). Group b (bupivacaine plus dexamethasone) generating vas values were lower than the mean vas value average in this study. From the statistical test showed a significant difference in the whole time of the examination ($p > 0.05$). Conclusion, there is not a difference statistically significant vas value in the delivery of a (bupivacaine normal saline plus 0.5%) than that of b (bupivacaine plus dexamethasone). The addition of dexamethasone as an adjuvant did not leave a lot of differences in the level of pain in this study assessment of pain in t3 was found that the data was not statistically significant ($p > 0.05$). Group b (bupivacaine plus dexamethasone) generating vas values were lower than the mean vas value average in this study. From the statistical test showed a not significant difference in the time of the examination ($p > 0.05$).

Keywords:- Bupivacain, Saline, Dexamethasone, Visual Analog Scale

I. INTRODUCTION

Adequate pain control is an important consideration in the management of post-operative patients. Pain felt very common in patients undergoing nasal surgery, especially in case of spinal manipulation and periosteal irritation. Several studies and clinical observations recommends that pain reduction can be performed by administering a local anesthetic combined with general anesthesia in surgery of the head and neck. Specifically, nerve blockade is added to the general anesthesia showed good pain control during and after surgery. Excess use of specific nerve block technique in endoscopic sinus surgery include reduced intraoperative and postoperative pain as well as the reduction of the use of general anesthesia during the procedure (Higashizawa, 2001; Masomi, 2012).

Fess (functional endoscopy sinus surgery) is a nasal endoscopic techniques provide a visualization of the paranasal sinuses and nasal cavity without incision medial skin. The patients who will undergoing fess, general anesthesia is preferred to keep airway and field operations that do not move. The combination with regional anesthesia in the form of a block can be done at the branching from the maxillary nerve, the infraorbital nerve (io) and ganglion sphenopalatin (sp) (Sim, 2014). Nervus infraorbital provides sensation to the cheek, upper lip, eyelids, and the lateral aspect of the nose, out through the nerve infraorbital foramen approximately 1 centimeter below the inferior border of the orbital, can be palpated with a finger, along the vertical line of the eye.

Bupivacaine is a local anesthetic amide groups are long-term (long-acting). Bupivacaine more hydrophobic chemical structure when compared with mepivacain and lidocaine. Although the onset bupivacaine longer, but can last longer in duration. Bupivacaine can bind to a protein, the which is consistent with a long duration potentially that could be cardiotoxic. Bupivacaine is a local anesthetic that is often used to block nerve in nasal surgery. Several studies conducted comparing the use of local anesthetics such as bupivacaine with normal saline. The use of adjuvant in local anesthesia may extend the regional

blockade. Vasoconstrictor can be used to vasoconstriction blood vessels and reduce the amount of local anesthetic absorption into the blood circulation.

Several studies and meta-analyzes have considered the controversy giving adjuvant that is considered potentially increase of local anesthetics work on peripheral nerve blocks such as dexamethasone. Dexamethasone is said to reduce the transmission of stimuli on nociceptive nerve fibers to the inhibition of potassium channels on nerves that will reduce the patient's perceived pain impulses. Dexamethasone can also cause vasoconstriction and slows tissue uptake and absorption of local anesthesia by a system of blood vessels that a longer duration of medication. In addition, as anti-inflammatory effects of dexamethasone can inhibit inflammatory mediators and cytokines such as interleukin thereby reducing the painful stimulation (olivier, 2015).

On the basis of explanation of some previous studies showing that dexamethasone as an adjuvant effect of peripheral nerve block, the researchers are interested in compare drug effects bupivacaine with bupivacaine plus dexamethasone on postoperative pain with infraorbital block technique in surgery FESS Hospital Haji Medan. Based on this background, it can be proposed formulation of the problem as follows are there differences in use bupivacaine effects plus 0.5% normal saline with 0.5% bupivacaine plus dexamethasone on postoperative pain with infraorbital block technique on FESS surgery?

II. METHOD

The study design is a randomized controlled trial (double-blind). The research was conducted at the integrated inpatient room, recovery room and PACU Haji Medan Hospital. The study began after the ethical clearance and permission from Haji Medan Hospital until the number of samples complete.

The study population was all patients who have undergone surgery inpatient wards FESS integrated, recovery room and PACU Haji Medan Hospital. The sampling technique used is non-probability sampling by consecutive sampling method. Patients included in this study are patients who have undergone surgery FESS and using the technique of regional anesthesia with general anesthesia in the form of block infraorbital, 19-65 year-old patients, and patients / families of patients who agreed to participate in the study. Exclusion criteria patients with a history is AVM, pathology in the anterior nasal cavity and patients with mental disorders. Patients were excluded in the study if they meet the criteria for drop out namely patient admission to the ICU and the patient was bleeding.

This study was conducted after obtaining informed consent and approved by the research ethics committee of health / part of education and training (training) faculty of medicine, University of north sumatera and Haji Hospital

Medan ethics committee. After that, outpatients or inpatients at Haji Hospital Medan undergoing FESS operations and meet the inclusion criteria will be required informed consent and requested fasting 6-8 hours prior to surgery. In the operating room, the patient was done inspection and assessment of electrocardiography (ECG), noninvasive arterial blood pressure (NIBP) and oximetry (SpO₂) and mean arterial pressure (MAP). Patients inserted infusion of normal saline and given fentanyl 2 mg / kg as analgesia and avoid intubation response. General anesthesia was induced with propofol using 1,5 - 2,5 mg / kg and tracheal intubation with rocuronium 0,4mg/kg. Mechanical ventilation initiated with carbon oxide-oxygen levels 35-40 mmHg. The patient is positioned 15 degrees reverse trendelenburg position to facilitate venous drainage. Anesthesia was maintained with nitrous oxide-oxygen levels (40-60%) and titrate propofol 100-150 mcg / kg / min to maintain the levels of MAP within 60-70 mmHg. If necessary, infusion of esmolol and / or nitroglycerin is given to control the MAP. Muscle relaxants rocuronium maintained with iv bolus of 0.02 mg / kg if necessary. Esmolol infusion and / or nitroglycerin is given to control the MAP. Muscle relaxants rocuronium maintained with iv bolus of 0.02 mg / kg if necessary.

Shortly before extubation, infraorbital block the nasal trans technique is done by using bupivacaine 0.5% (of 1 - 1.5 mg / kg with a maximum dose of 100 mg) plus normal saline and bupivacaine plus dexamethason 0.5% (0.1 mg / kg) respectively in group B plus NS and B plus D using 25g 1.5 inch long needle is positioned through the ipsilateral nares. After negative aspiration, the drug is injected. Patients who have undergone surgery fess rated pain using the vas scale (score 0-10) and the need for extra analgesics in the first 24 hours. Agent extra analgesia will be given when the patient needs. Agent analgesia given in the form of fentanyl is intravascular. The data will be recorded with the technique of double-blind. After the data collected then analyzed the data

III. RESEARCH RESULT

A. Demographic Characteristics of Respondents Research

This study was conducted in August-October 2018 Surgical Room Center Haji Hospital Medan. This study was conducted by *double blind randomized control trial*, this study was followed by 40 samples that will be done functional endoscopy sinus surgery (FESS) with supraorbital block anesthesia techniques. In the sample rated incidence of pain experienced after using the technique supraorbital block bupivacain plus saline in the first group and bupivacain plus dexamethasone in the second group. Examination of pain performed at 1 h after surgery (T1), 6 hours after surgery (T2), 12 hours after surgery (T3), and 24 hours after surgery (T4).

Gender	Intervention*		Total	Percentage (%)	P value **
	A	B			
Man	8 (40%)	12 (60%)	20	50	.247
Woman	12 (60%)	8 (40%)	20	50	
Total	20	20	40	100	

Table 1:- Table Sample Distribution by Sex

* A = bupivaqain plus saline, B = bupivaqaine plus dexamethasone, ** Anova

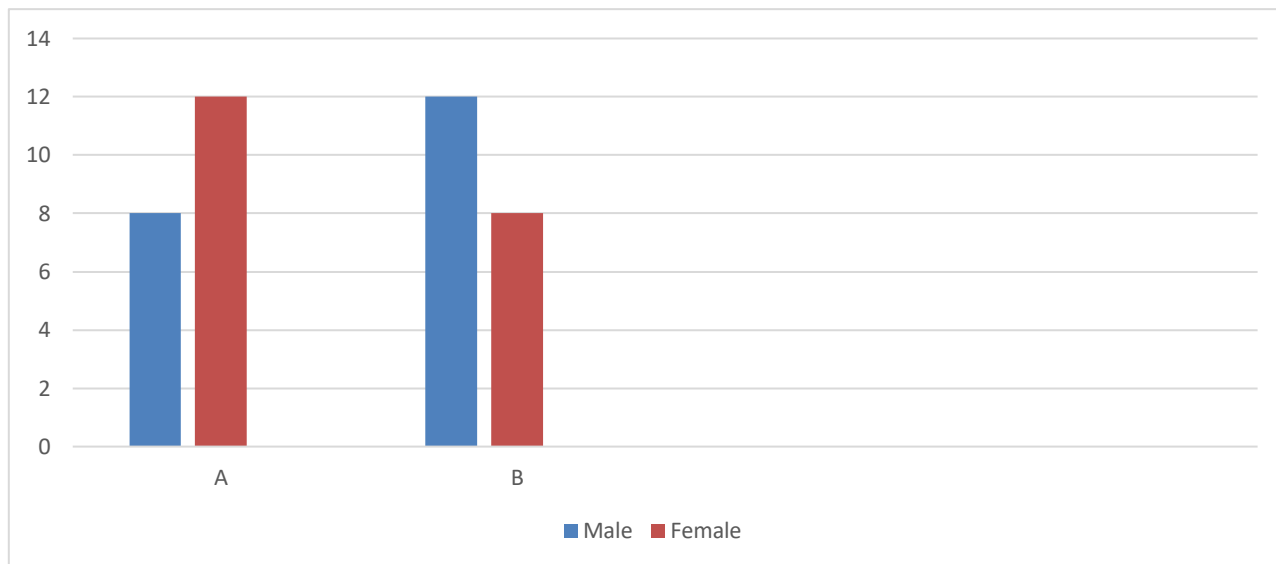


Fig 1:- Distribution of the Sample by Gender

Based on the study Table 1. showed 40 samples examined include male gender which men as much as 20 samples (50%) and female as many as 20 samples (50%). In group A (bupivaqain plus saline) followed by 8 samples

male and female 12 samples (60%). While in group B (bupivaqaine plus dexamethasone) followed by 12 sample male and 8 samples female. From the results of statistical tests found normal distribution results in table 1 ($p > 0.05$).

Age group	Intervention*		Total	Percentage (%)	P value **
	A	B			
17-31 years	7 (35%)	12 (60%)	19	47.5	0,316
32-46 years	8 (40%)	4 (20%)	12	30	
47-61 years	2 (10%)	2 (10%)	4	10	
> 61 years	3 (15%)	2 (10%)	5	12.5	
Total	20	20	40	100	

Table 2:- Table Sample Distribution by Age

* A = bupivaqain plus saline, B = bupivaqaine plus dexamethasone, ** Anova

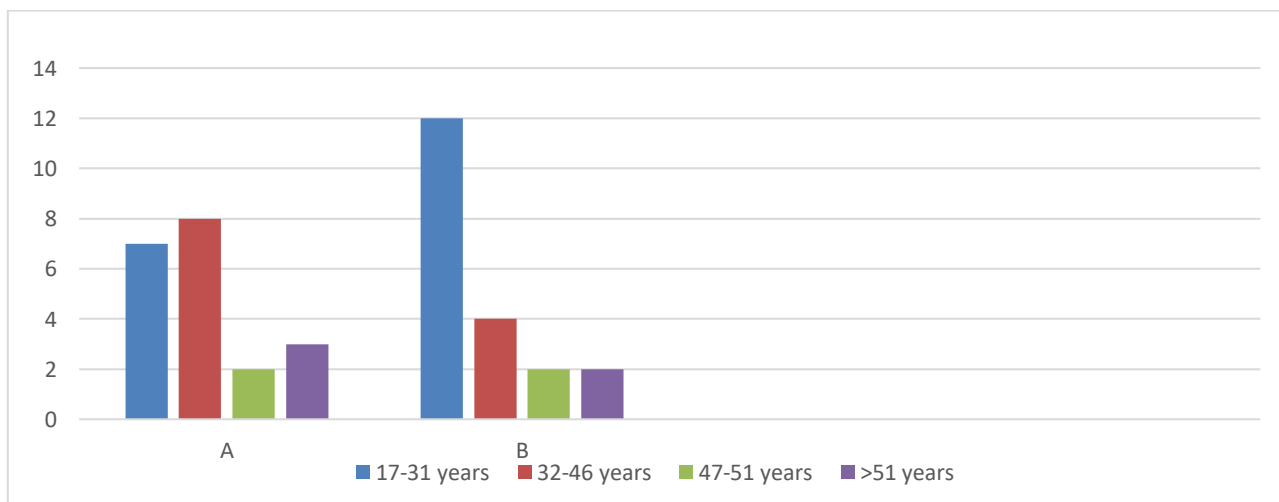


Fig 2:- Distribution of the Sample by Age Group

Based on table 2 can be seen in group A, followed by 7 samples (35%) in the age group 17-31 years, 8 samples (40%) in the age group 32-46 years, 2 samples (10%) in the age group 47 - 61 years and 3 samples (15%) in the age group > 61 years. While in group B, followed by 12

samples (60%) in the age group 17-31 years, 4 samples (20%) in the age group 32-46 years, 2 samples (10%) in the age group 47-61 years, and 2 samples (10%) in the age group > 61 years. Based on statistical test found data is relatively homogeneous ($p > 0.05$).

Tribe	Intervention*		Total	Percentage (%)	P value **
	A	B			
Aceh	1 (5%)	1 (5%)	2	5	.621
Batak	5 (25%)	6 (30%)	11	27.5	
Java	7 (35%)	5 (25%)	12	30	
Mandailing	1 (5%)	2 (10%)	3	7.5	
Malay	6 (30%)	5 (25%)	11	27.5	
Padang	0 (0%)	1 (5%)	1	2.5	
Total	20	20	40	100	

Table 3:- Table Distribution of Samples by Tribe

* A = Bupivaqain plus Saline, B = Bupivaqaine plus Dexamethasone ** anova

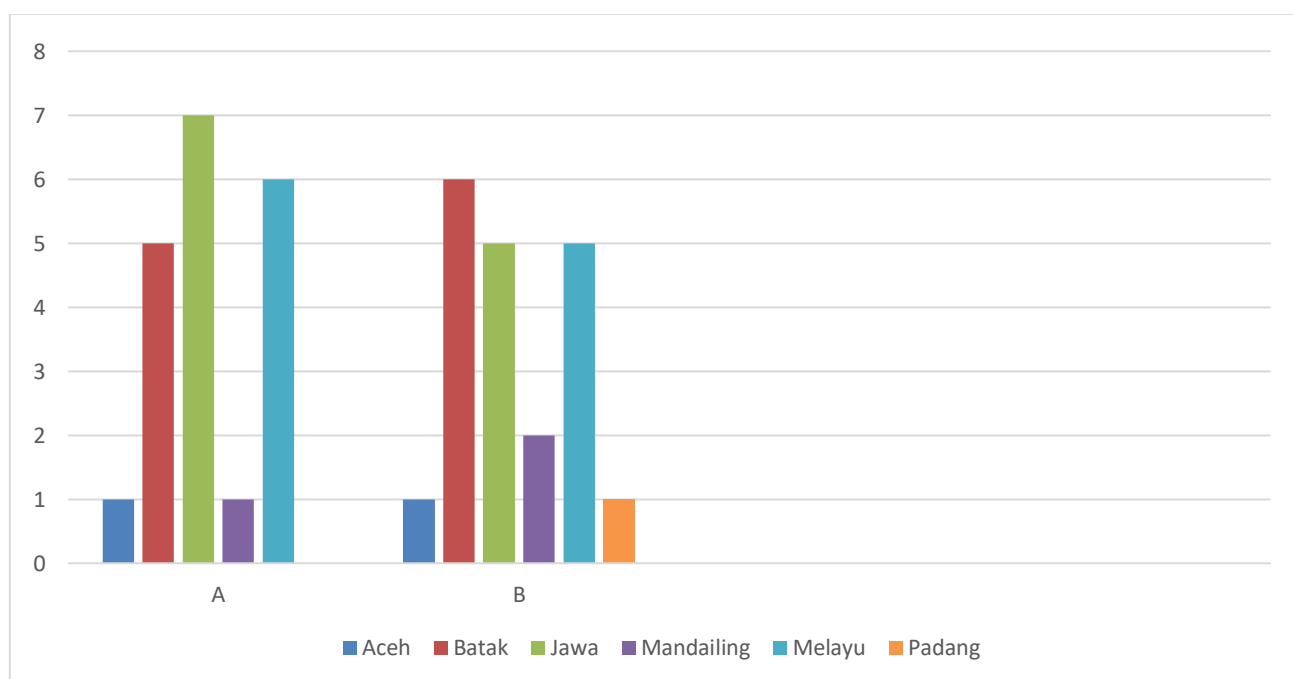


Fig 3:- Distribution of Samples by Tribe

According to the Table 3 Show can be seen in group a were found 1 samples (5%) acehnese, 5 samples (25%) batak, 7 samples (35%) of the javanese, 1 samples (5%) and 6 samples mandailing rate (30 %) of the malays. While in group B were found 1 samples (5%) acehnese, 6

samples (30%) batak, 5 samples (25%) of the javanese, 2 samples (10%) rate mandailing, 5 samples (25%) of the malays and 1 samples (5%) ethnic padang. Based on statistical test found data is relatively homogeneous ($p > 0.05$).

B. Drug Treatment Effects on Sample

➤ **Drug Treatment Effect at T0**

Vase	Group*		Total	The p-value *
	A	B		
0	1 (5%)	0 (0%)	1 (2.5%)	.0517
1	16 (80%)	18 (90%)	34 (75%)	
2	3 (15%)	2 (10%)	5 (12.5%)	
Total	20 (100%)	20 (100%)	40 (100%)	

Table 4:- Effects Drug Treatment at T0

* A = Bupivaqain plus Saline, B = Bupivaqaine plus Dexamethasone, ** Chi-square

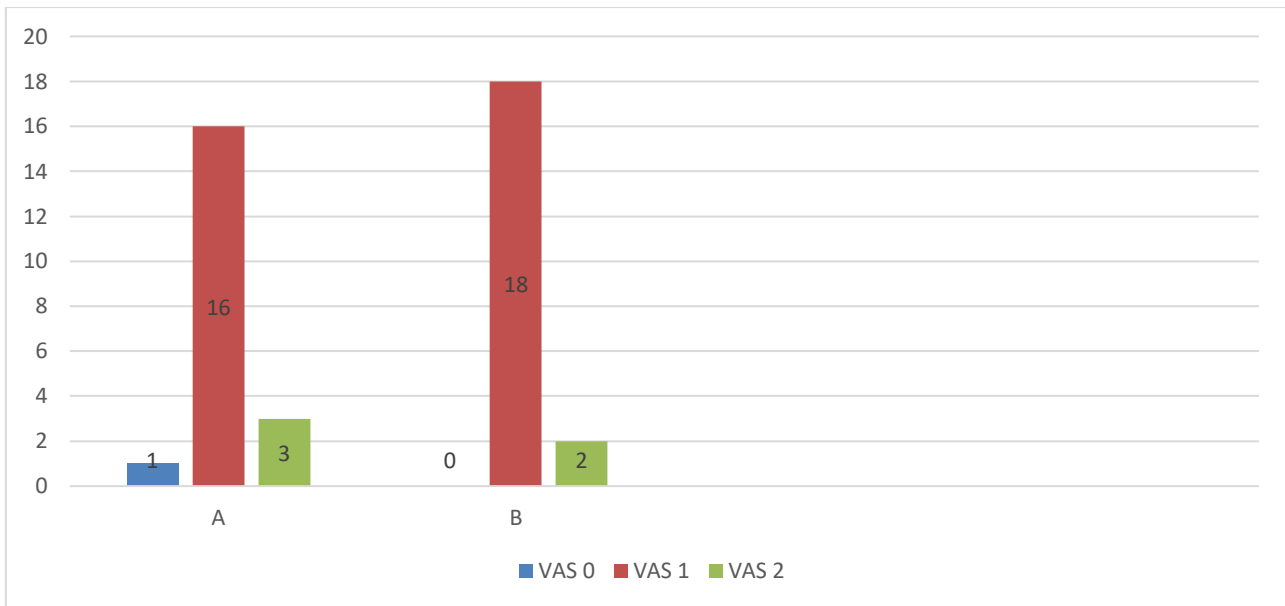


Fig 4:- Effect of the Drug Treatment T0

Based on table 4 are found on inspection 1 hour after surgery (T0) found samples in group a, have no pain (VAS 0) in 1 sample (5%), the sample felt mild pain with VAS 1 as many as 16 samples (80%) and who feel mild pain with VAS 2 by 3 samples (15%). While in group b at T0 no pain

(VAS 0) as 0 sample (0%), the sample felt mild pain with VAS 1 as many as 18 samples (90%) and who feel mild pain with VAS 2 by 2 samples (10 %). Based on pain assessment at T0 found that the data was not statistically significant ($p > 0.05$).

➤ Drug Treatment Effect on T1

Vase	Group*		Total	The p-value *
	A	B		
0	1 (5%)	0 (0%)	1 (2.5%)	0433
1	5 (25%)	5 (25%)	10 (25%)	
2	5 (25%)	9 (45%)	14 (35%)	
3	9 (45%)	6 (30%)	15 (37.5%)	
Total	20 (100%)	20 (100%)	40 (100%)	

Table 5:- Effect of the Drug treatment on T1

* A = Bupivaqain plus Saline, B = Bupivaqaine plus Dexamethasone ** Chi-square



Fig 5:- Effect of Drug Treatment against T1

Based on table 5 was found on examination to 6 hours after surgery (T1) found samples in group a, have no pain (VAS 0) in 1 sample (5%), the sample felt mild pain with vas 1 as much as 5 samples (25%), who feel mild pain with vas 2 by 5 samples (25%), and mild pain with VAS 3 by 9 samples (45%). While in group B at T1 no pain (VAS

0) as 0 sample (0%), the sample felt mild pain with VAS 1 as much as 5 samples (25%), feeling mild pain with VAS 2 by 9 samples (45 %) and mild pain with VAS 3 for 6 samples (30%). Based on the assessment of pain in the T1 data is not found to be statistically significant ($p > 0.05$).

➤ Drug Treatment Effects on T2

Vase	Group*		Total	The p-value *
	A	B		
1	9 (45%)	14 (70%)	23 (57.5%)	0214
2	10 (50%)	6 (30%)	16 (40%)	
3	1 (5%)	0 (0%)	1 (2.5%)	
Total	20 (100%)	20 (100%)	40 (100%)	

Table 6:- Drug Treatment Effects on T2

* A = Bupivaqain plus Saline, B = Bupivaqaine plus Dexamethasone, ** Chi-square

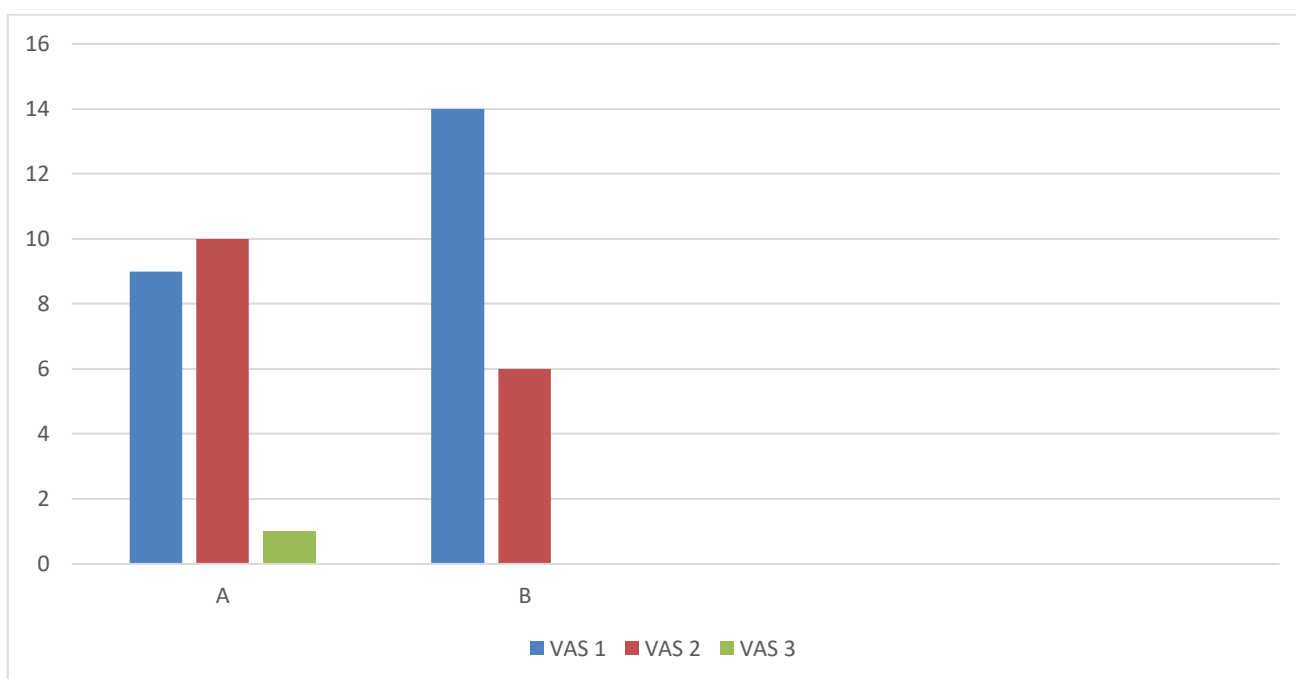


Fig 6:- Effect of Drug Treatment against T2

According to the table 6 found that in the examination 12 hours after surgery (T2) samples were found in group a sample of mild pain with VAS 1 as much as 9 samples (45%), feeling mild pain with VAS 2 of 10 samples (50%) and who feel mild pain with VAS 3 in 1 sample (5%). While in group b at T1 samples feel mild

pain with VAS 1 as many as 14 samples (70%), feeling mild pain with VAS 2 by 6 samples (30%) and who feel mild pain with VAS 3 from 0 sample (0%). Based on the assessment of pain in T2 data found statistically significant ($p > 0.05$).

➤ Drug Treatment Effect on T3

Vase	Group*		Total	The p-value *
	A	B		
0	17 (85%)	20 (100%)	37 (92.5%)	0075
1	3 (15%)	0 (0%)	3 (7.5%)	
Total	20 (100%)	20 (100%)	40 (100%)	

Table 7:- Drug Treatment Effects on T3

* A = Bupivaqain plus Saline, B = Bupivaqaine plus Dexamethasone, ** Chi-square

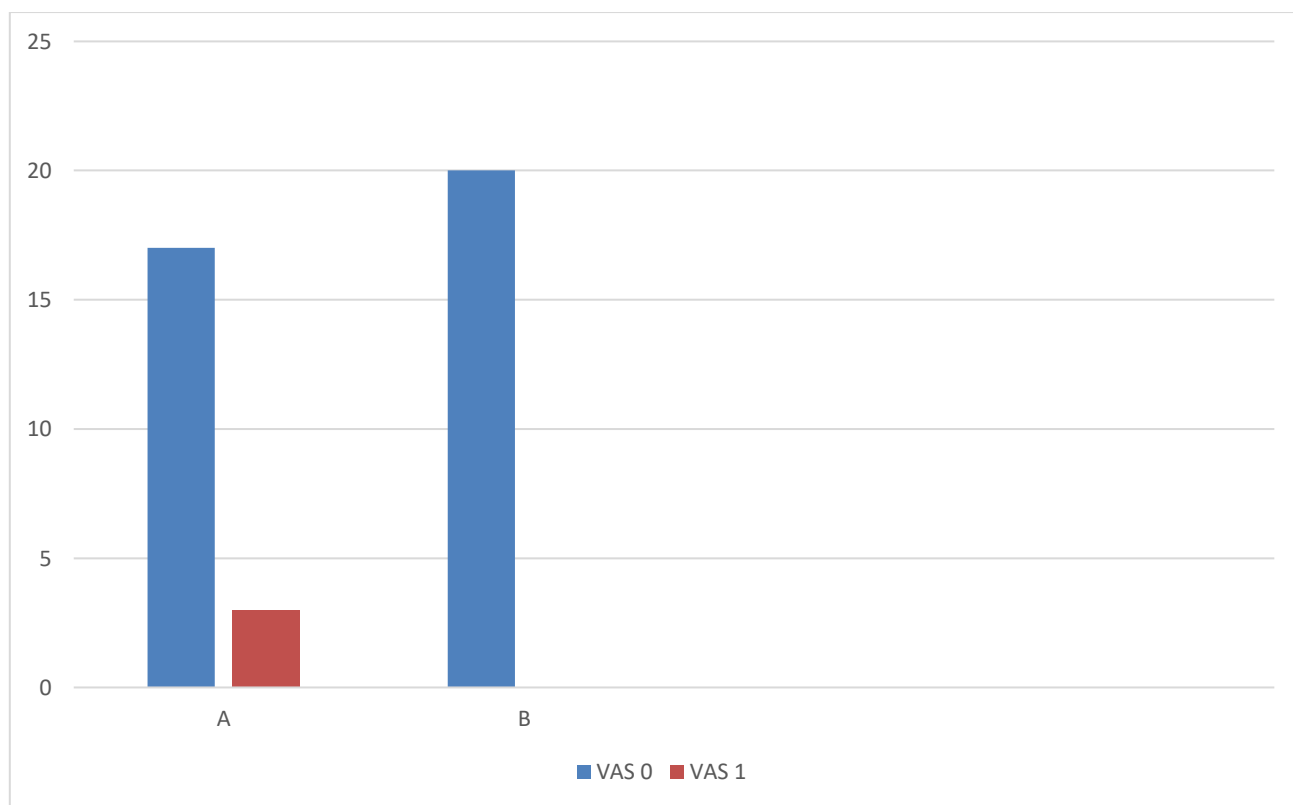


Fig 7:- Effect of Drug Treatment to T3

Based on the examination Table 7 Found 24 hours after surgery (T3) samples were found in group A, have no pain (VAS 0) as many as 17 samples (85%), and the sample felt mild pain with VAS 1 as much as 3 samples

(15%). While in group b at T1 no pain (VAS 0) of 20 samples (100%), and the sample felt mild pain with VAS 1 as 0 sample (25%). Based on T3 pain assessment found that the data was not statistically significant ($p > 0.05$).

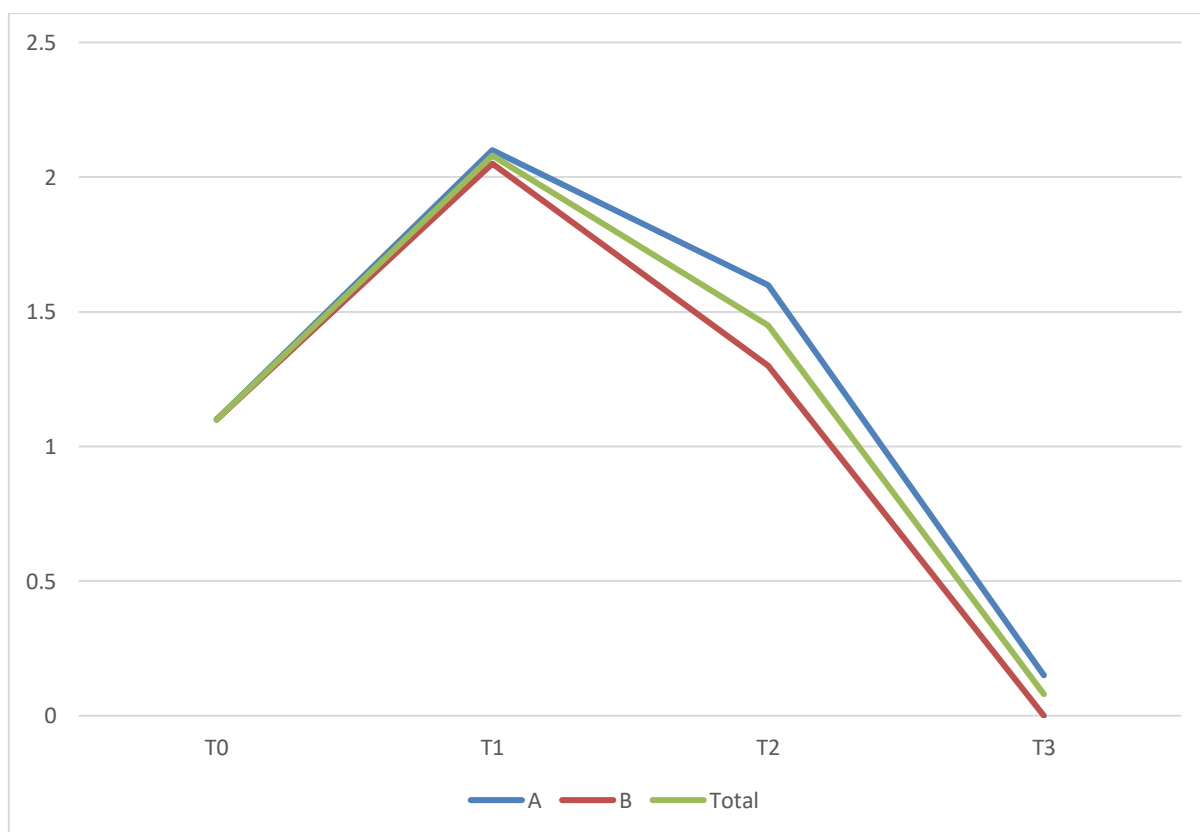


Fig 8:- The Mean Vas Score at any Time of the Examination

Based on the chart above can be seen that the group B produces a lower vas values than the average vas value - average in this study. From the statistical test showed a significant difference in the whole time of the examination ($p > 0.05$).

IV. DISCUSSION

This study was conducted to determine differences in the effects of the use of bupivacaine 0.5% coupled with normal saline with 0.5% bupivacaine plus dexamethasone on postoperative pain with techniques supraorbital block at fess surgery. Good pain management will improve the outcome of surgery to reduce morbidity and speed up recovery time.

A. Demographic Characteristics of Study Sample

The research was conducted at Haji Hospital Medan in August-October 2018 and was followed by 40 samples in accordance with the inclusion and exclusion criteria. From the characteristics of the study based on gender (table 1) were found in group a (bupivacaine plus normal saline) followed most of the samples were female as 12 samples (60%) and male as 8 samples (40%). While in group B (bupivacaine plus dexamethasone) most widely followed by a sample male as 12 samples (60%) and female as 8 samples (40%). Based on the results obtained sex characteristics data is relatively homogeneous ($p > 0.05$).

From the characteristics of the sample distribution by age group (table 2) found most frequently in group a sample of the age group of 32-46 years of the 8 samples (40%) and the least in the age group 47-61 years of the two samples (10 %). While in group b in this study most widely followed by the sample in the age group 17-31 years of the 12 samples (60%) and the least in the age group 47-61 and over 61 years know that as 2 samples (10%) in each group. Based on the characteristics of the age groups showed relatively homogeneous data ($p > 0.05$).

From the characteristics of the sample distribution based on ethnicity (table 3) found most frequently in group a samples have java rate is 7 samples (35%) and the least that has a Padang is 0 sample (0%), while in group b samples that follow this study most in Batak as many as 6 samples (30%) and the least was the desert tribes that as 1 samples (5%). Based on the distribution characteristics of the sample based on the rate of data is found relatively homogeneous results ($p > 0.05$).

B. Drug Treatment Effects on Sample

The examination time T0 shown by table 4 that in group a samples have no pain with VAS 0 as 1 samples (5%), the samples are mild pain with VAS 1 as 16 samples (80%) and who feel mild pain with VAS 2 by 3 samples (15%). While in group b at T0 no pain (VAS 0) as 0 sample (0%), the sample felt mild pain with VAS 1 as many as 18 samples (90%) and who feel mild pain with VAS 2 by 2 samples (10 %). Based on pain assessment at

T0 found that the data was not statistically significant ($p > 0.05$).

The examination time T1 shown by table 5. That in group a sample, have no pain (VAS 0) in one sample (5%), the samples are mild pain with VAS 1 as 5 samples (25%), the moderate pain with VAS 2 by 5 samples (25%), and mild pain with VAS 3 by 9 samples (45%). While in group b at T1 no pain (VAS 0) as 0 sample (0%), the sample felt mild pain with VAS 1 as much as 5 samples (25%), feeling mild pain with VAS 2 by 9 samples (45%) and mild pain with VAS 3 for 6 samples (30%). Based on the assessment of pain in the t1 the data is not found to be statistically significant ($p > 0.05$).

The examination time T2 shown by table 6 that in group a sample feel mild pain with VAS 1 as 9 samples (45%), feeling mild pain with VAS 2 of 10 samples (5%), and who feel mild pain with VAS 3 in 1 sample (5%). While in group B at T1 samples feel mild pain with VAS 1 as 14 samples (70%), feeling mild pain with VAS 2 by 6 samples (30%) and who feel mild pain with VAS 3 from 0 sample (0%). Based on the assessment of pain in T2 data found statistically significant ($p > 0.05$).

The examination time T3 shown in table 7. A sample was found in the group that had no pain (VAS 0) as 17 samples (85%), and the sample felt mild pain with VAS 1 as 3 samples (15%). While in group B at T1 no pain (VAS 0) of 20 samples (100%), and the sample felt mild pain with VAS 1 as 0 sample (25%). Based on t3 pain assessment found that the data was not statistically significant ($p > 0.05$).

In figure 8 it can be seen that the group B produces a lower VAS values than the average VAS value average in this study. From the statistical test showed a significant difference in the whole time of the examination ($p > 0.05$).

Several studies and meta-analyzes have considered the pros and cons of giving adjuvant that is considered potentially increase of local anesthetics work on peripheral nerve blocks such as dexamethasone. Dexamethasone is to reduce the transmission of stimuli on nociceptive nerve fibers to the inhibition of potassium channels on nerves that will reduce the patient's perceived pain impulses. Dexamethasone can also cause vasoconstriction and slows tissue uptake and absorption of local anesthesia by a system of blood vessels that a longer duration of medication. In addition, as anti-inflammatory effects of dexamethasone can inhibit inflammatory mediators and cytokines such as interleukin thereby reducing the painful stimulus (olivier, 2015).

Some studies such as that choi (2014) proved that the use as an adjuvant to extend dexamethason plexus block brachial from 730 minutes to 1306 minutes on the long-term local anesthetic and 168 minutes to 343 minutes in the intermediate-term anesthesia. Dexamethason thought to reduce inflammatory mediators, lowering the ectopic neuronal discharges, and inhibition of potassium channels

in the c-fiber nociceptive. Several other studies examined also the dexamethason after the study. The duration of the brachial plexus block with lidocaine and epinephrine is extended to be doubled by the addition dexamethason on the study of patients undergoing elective surgery on the hands, palms and elbows.

Prolongasi mechanism of peripheral nerve blockade by dexamethason not known with certainty. This prolong effects associated with anti-inflammatory effects of glucocorticoids in which the degree of prolongasi block increases with increasing potency of glucocorticoids and this effect can be reversed by administration of glucocorticoids receptor antagonists. The effects of the glucocorticoid receptor is suspected alter the function of the ion channels or causing local acidosis in nerve cells so that the local anesthetic concentration required to inhibit conduction decreases or with bupivacaine confining ionized molecules in neuronal cells (biradar, 2013).

It should be noted that the duration of analgesia and the duration of the block is not the same and the effect of drugs also affect the systemic dexamethason. Fredrickson (2013) found that pain relief was reported after 24 hours of patients given bupivacaine to block the sciatic perineural dexamethasone versus dexamethasone subcutaneously / intramuscularly. In another study, who received dexamethason patients reported a significant decrease in pain during surgery, postoperative pain, and a better level of satisfaction. Saritas (2014) also found prolongasi effect brachial plexus block with the addition dexamethason, but the duration of the block is shorter than the group that only received levobupivacaine.

In a study conducted liu (2015) demonstrate the analgesia dexamethason extend up to about 10 hours compared to the control groups shoulder surgery using 0:25% bupivacaine, and is achieved with no preservatives perineural dexamethason dose varies from 1 mg, 2 mg, and 4 mg. Effect on the liu study could be confused with dexamethason iv administration as an antiemetic in both groups. Observational study conducted by William (2011) reported a reduction of the duration of analgesia and elevation of rebound pain by administering 2 mg perineural dexamethason (versus 1 mg), at a dose of 1-2 mg doses of perineural dexamethason lower than all the doses mentioned above.

V. CONCLUSION

- There is not a difference statistically significant VAS value on giving bupivacaine 0,5% plus normal saline compared with bupivacaine plus dexamethasone.
- The addition of dexamethasone as an adjuvant did not leave a lot of differences in the level of pain in this study

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