Comparison of Vas Values to The Administration of Oral Preemptive 10 Mg Oxycodone and 15 Mg Morphine Sulphate in Patients After Upper or Lower Extremities Surgery with General Anesthesia

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***Abstract*- Background:** Postoperative pain is an unresolved problem even though understanding of pain management continues to grow. Several studies of preemptive analgesia show that administration of systemic opioids before surgery is more effective in reducing postoperative pain. Oxycodone and morphine sulphate are opioids that are often used as analgesia and have 1:1 analgesic potential.

Objective: To determine the comparison of VAS values with oral administration of 10 mg oxycodone and 15 mg morphine sulphate in patients after upper or lower extremities surgery with general anesthesia.

Method: This research is an experimental double-blind randomized design. After obtaining approval from Ethics Committee, Faculty of Medicine, Universitas Sumatera Utara, based on inclusion and exclusion criterias, 66 research samples were collected. All sample were divide into 2 groups. Group I received 10 mg oxycodone and group II received 15 mg morphine sulphate. Data were tested by Chi Square with significance of $p<0.05$ (statistically significant).

Results: This study found a statistically significant difference in the average VAS value 6 hours after drug administration at the time of T1 and 12 hours after drug administration at the time of T2. No significant difference found ($P>0.05$) for additional analgesics.

Conclusion: Postoperative Pain, VAS, PONV, Analgesics, Oxycodone, Morphine sulphate

***Index Terms*-** About four key words or phrases in alphabetical order, separated by commas. Keywords are used to retrieve documents in an information system such as an online journal or a search engine. (Mention 4-5 keywords)

I. Introduction

Surgery and anesthesia are health care services that plays important role in reducing the risk of death and disability of million peoples around the world every year. The need for surgery and anesthesia services is expected to continue and increase over the next few years. Globally, nearly 313 million operations were performed in 2012, while in the US, estimated 28 million inpatient surgical procedures and 48 million outpatient surgeries were reported in 2006 and 2010. Although surgery and anesthesia play a significant role in reducing the risk of death and disability, surgery is also associated with potential dangers, including pain during and after surgical procedures.[1,2]

Postoperative pain is an unresolved and uncontrolled problem although good understanding of pain mechanism and increased progress in the pain management approach continues to develop. According to US Institute of Medicine data, 80% of patients who undergo surgery report postoperative pain, with 88% of these patients reporting moderate, severe, or extreme pain. In national survey of United States, about 300 adults who underwent surgery in the previous 5 years, 86% of patients experienced postoperative pain, and 75% of patients who reported pain were found to have moderate-extreme pain during postoperative period.[3]

Effective management of postoperative pain is essential. Effective pain management with few side effects will speed up the recovery and return of patients from hospital. Providing adequate postoperative analgesics is a priority, and remains a major challenge. There are several groups that often used to treat postoperative pain. One of them is opiod. Opioids are natural or synthetic compounds that produce effects such as morphine sulphate. All drug in this category work by binding to specific opioid receptors on central nervous system to produce effects that mimic the effects of the neurotransmitter endogenous peptide, opiopeptin (eg endorphins and encephalins). The main use of opioid analgesic is to relieve deep pain and accompanying anxiety, either due to surgery as the result of wound or disease such as cancer.[5]

This is also appropriate with research obtained that oral oxycodone showed a better effect in reducing postoperative pain compared to placebo in patients undergoing laparoscopic cholecystectomy, abdominal or pelvic surgery, bunionectomy, breast surgery, and spinal surgery. When compared with intravenous opioids, oral oxycodone provides better or comparable pain relief in knee arthroplasty, spinal surgery, cesarean section, laparoscopic colorectal surgery, and cardiac surgery. One of postoperative pain study reported that pain control

with oral oxycodone is lower than morphine sulphate. In many studies, the demand for additional dose of analgesia and total opioid consumption was reduced in oxycodone treatment group. Patients who received oral oxycodone experienced fewer opioid-related side effects than other opioids, and experienced the same postoperative nausea and vomiting (PONV) as patients using placebo.[4]

II. METHODS

This study is an experimental study, a double-blind randomized design with administration of 10 mg oxycodone and 15 mg morphine sulphate to the degree of postoperative pain in patients undergoing upper and lower extremity surgery under general anesthesia. Consecutive sampling is a sample selection technique by which all subjects who come and meet the selection criteria are included in the study until the number of subjects is met. After obtaining approval from Ethics Committee, Faculty of Medicine, Universitas Sumatera Utara, based on inclusion and exclusion criteria 66 research samples were collected. All samples were divided into 2 groups. Group I received 10 mg oxycodone and group II received 15 mg morphine. Data were tested by Chi Square with significance of $p<0.05$.

III. RESULTS

The study was followed by 66 subjects who were divided into two groups with the same amount, each as many as 33 people where group A received 15 mg morphine sulphate-Controlled Release (CR) and group B received oral 10 mg oxycodone-Controlled Release (CR).

4.1 Demographic Data Table

	Morphine sulphate		Oxycodone		P value
Age Group	N	%	N	%	
18-30	10	30,3	10	30,3	
31-43	7	21,2	3	9,1	0,396*
44-56	9	27,3	8	24,2	
57-70	7	21,2	12	36,4	
Sex Group	N	%	N	%	
Men	19	57,6	24	72,7	0,301**
Woman	14	42,4	9	27,3	
The Duration Of Operation	N	%	N	%	
<2 hours	19	57,6	9	27,3	
2-4 hours	14	42,4	24	72,7	0,434**
Total	33	100	33	100	

Table 4.1 shows that the sample frequency in terms of age was found to be highest in the age range of 57-70 years with 12 samples (36.40%) in oxycodone group and 7 samples (21.2%) in morphine sulphate group. The second largest age range was 18-30 years in morphine sulphate group of 10 samples (30.3%) and in oxycodone group of 10 samples (30.3%). The third highest age range of 31-43 years was found in morphine group with a total of 7 samples (21.2%) and in oxycodone group of 3 samples (9.1%).

Subjects with male sex in the morphine sulphate-CR group were 19 people (57.6%) and women as many as 14 people (42.4%). Subjects with male sex in the oxycodone-CR group were 24 people (72.7%) and women as many as 9 people (27.3%).

Figure 4.3 shows that the duration of surgery with duration < 2 hours in the morphine sulphate-CR group were 19 people (57.6%) and the duration of operation > 2 hours were 14 people (42.4%). Whereas in the oxycodone-CR group with < 2 hours duration of operation were 9 people (27.3%) and > 2 hours as many as 24 people (72.7%).

4.2 VAS Value Normality Test

VAS	Value P*	Information
T0	0,123	Normal
T1	0,123	Normal
T2	0,123	Normal

*Kolmogorov-Smirnov test

The statistical test used for the normality test (table 4.2) between the control group and the case group is the Kolmogorov-Smirnov test, and obtained data with normally distributed results ($p> 0.05$).

4.3 VAS Value T0

	Morphine sulphate		Oxycodone		P value*
VAS	N	%	N	%	
1	7	21,2	7	21,2	
2	15	45,5	15	45,5	0,956
3	11	33,3	11	33,3	
Total	33	100	33	100	

Table 4.3 Is the result of the chi square test, a table comparing the VAS values between the Morphine sulphate and Oxycodone group when T0 was found in patients who had VAS 1 in the morphine group were 7 people (21.2%) and the Oxycodone group 7 people (21.2). Samples that had VAS 2 in the morphine sulphate group were 15 (45.5%) and the oxycodone group 15 people (45.5). Samples that had VAS 3 at T0 in the morphine sulphate group were 11 people (33.3%) and the oxycodone group 11 people (33.3%). It can be seen that there were no statistically significant differences in the mean VAS results before treatment at T0 (p = 0.956).

4.4 VAS Value T1

	Morphine sulphate		Oxycodone		P value*
VAS	N	%	N	%	
1	0	0	3	9,1	
2	15	45,5	15	45,5	
3	13	39,4	13	39,4	0,001
4	5	15,2	2	6,1	
Total	33	100	33	100	

Table 4.4 Is the result of the chi square test, a table comparing the VAS values between the morphine sulphate and oxycodone groups when T1 was found in patients who had VAS 1 in the morphine sulphate group were 0 people (0%) and the oxycodone group 3 people (9.1). Samples that had VAS 2 in the morphine group were 15 (45.5%) and the oxycodone group 15 people (45.5%). Samples that had VAS 3 at T1 in the morphine sulphate group were 13 people (39.4%) and the oxycodone group 13 people (39.4%). Samples that had VAS 4 on T1 in the morphine sulphate group were 5 people (15.2%) and the oxycodone group 2 people (6.1%). It can be seen that there was a statistically significant difference in the average results of the VAS value 8 hours after drug administration at T1 (p <0.05)

4.5 VAS Value T2

	Morphine suphate		Oxycodone		P value*
VAS	N	%	N	%	
1	2	6,1	0	0	
2	4	12,1	11	33,3	
3	11	33,3	9	27,3	
4	9	27,3	6	18,2	0,000
5	6	18,2	7	21,2	
6	1	3,0	0	0	
Total	33	100	33	100	

Table 4.5 Is the result of the chi square test, a comparison table of VAS values between the morphine sulphate and oxycodone group when T2 was found in patients who had VAS 1 in the morphine sulphate group were 2 people (6.1%) and the oxycodone group 0 people (0%). Samples that had VAS 2 in the morphine sulphate group were 4 (12.1%) and the 11-person oxycodone group (45.5%). Samples that had VAS 3 in the morphine sulphate group were 11 people (33.3%) and the oxycodone group 9 people (27.3%). Samples that have VAS 4 in the morphine sulphate group are 9 people (27.3%) and an oxycodone group of 6 people (18.2%), samples that have VAS 5 in the morphine sulphate group are 6 people (18.2%) and an oxycodone group of 7 people (21.2%)), VAS 6 in the morphine sulphate group is 1 person (3.0%) and the oxycodone group is 0 people (21.2%). It can be seen that there is a statistically significant difference in the mean VAS results 12 hours after administration of the drug at the time of T2 (p<0,05)

4.7 Additional Analgesic Value T1

Groups	Additional analgesics T1		Total	P Value *
	No	Yes		
Oksikodon (%)	30 (91)	3 (9)	33 (100)	0.692
Morfin (%)	29 (88)	4 (12)	33 (100)	
Total	59	7	66	

Table 4.7 shows the results of the chi square test showing the use of additional analgesic drugs used at the time of T1 (6 hours after drug administration) of this study. In the oxycodone group, 3 samples needed additional analgesic drugs while in the morphine group 4 samples needed additional analgesic drugs. It can be seen that there is a difference in the number of patients receiving additional analgesics, but it is not statistically significant (P> 0.05). This illustrates that both the oxycodone and morphine sulphate groups received the same additional analgesics at T1.
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4.8 Additional Analgesic Value T2

Group	Additional Analgetic T2		Total	P Value
	No	Yes		
Oksikodon (%)	19 (58)	14 (42)	33 (100)	0.806
Morfin (%)	18 (55)	15 (45)	33 (100)	
Total	37	29	66	

Table 4.8 shows the results of the chi square test showing the use of additional analgesic drugs used at the time of T2 (12 hours after drug administration) of this study. In the oxycodone group there were 14 samples requiring additional analgesic drugs while in the morphine sulphate group 15 samples needed additional analgesic drugs. It can be seen that there is a difference in the number of patients receiving additional analgesics, but it is not statistically significant (P> 0.05). This illustrates that both the oxycodone and morphine sulphate groups received the same additional analgesics at T2.

IV. CONCLUSIONS

There is no difference in the value of VAS before and after the treatment of oxycodone with morphine sulphate in the observation before drug administration, but showed a significant difference in the observation 6 hours after drug administration and 12 hours after drug administration. Patients given oxycodone have post-upper or lower extremity pain with the highest VAS 2 VAS at observation before drug administration, 6 hours after drug administration and 12 hours after drug administration.

In patients who were given morphine sulphate, post-upper and lower extremity pain with the highest VAS 2. VAS was observed before drug administration and 6 hours after drug administration and VAS 3 was observed 12 hours after drug administration. In patients given morphine sulphate, post-pain is obtained. Side Effects of PONV are more common in patients given morphine sulphate than oxycodones.

The use of additional analgesics is more common in patients given morphine sulphate compared with oxycodone at the observation 6 hours after drug administration and 12 hours after drug administration.upper and lower extremity surgeries with the highest VAS value VAS 2 at the observation before drug administration and 6 hours after drug administration and VAS 3 at observation 12 hours after drug administration.

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