

The Comparison Between Tramadol With Ketorolac As Analgesic Post Appendectomy At Pku Muhammadiyah Hospital Of Yogyakarta

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Abstract: Appendicitis is an inflammation of the appendix vermiformis. Management of appendicitis is with surgery (appendectomy) that may cause postoperative pain. Analgesic tramadol is one kind of opioid analgesics, whereas ketorolac is one type of non-opioid analgesics. The study is an observational analytic study using secondary data. The subject of the study amounted to 38 people who have done appendectomy laparoscopic group, consisted of 20 people with tramadol (tramadol group) and 18 people with ketorolac (ketorolac group). All study subjects were then calculated how long the duration of post-operation pain free. The results of this study showed that the average duration of pain-free for the tramadol group is 6.42 hours (6 hours 25 minutes), while for the ketorolac group is 5.91 hours (5 hours 54 minutes). Based on independent sample t-test analysis test, there were no significant differences in the average duration of pain-free patients in both groups ($p > 0.05$), so it can be concluded that tramadol and ketorolac have the same level of effectiveness in the management of pain in post appendectomy in PKU Muhammadiyah Hospital of Yogyakarta.

Keywords: analgesic, tramadol, ketorolac, appendectomy, effectiveness.

Introduction

Appendicitis that by the common people known as the appendix is an inflammation of the appendix vermiformis¹. Appendicitis is higher in advanced countries than in developing countries. This is because people in advanced countries prefer to eat instant foods that are low in fiber without thinking of the needs of fiber to the body. Epidemiological research shows the role of low-fiber food eating habits and constipation influence on the incidence of appendicitis².

Management of appendicitis is with surgery (appendectomy). Recently laparoscopic surgical techniques have become *procedure of choice* in many major hospitals in Indonesia³. This surgical technique reduces damage on the tissue, thereby reducing post-surgical pain, faster wound healing, as well as the recovery of peristalsis (movement) of intestine which is not too long⁴.

Surgical wound is very likely to cause post-surgical pain. Therefore, the prevention of post-surgical pain should be planned before surgery so that patients are not disturbed by the post-surgical pain. Management of postoperative pain pharmacologically among others with the use of anesthetic and the giving of analgesic².

Pain is a sensory feeling which is subjective and unpleasant emotional experience as a result of tissue damage or potentially damaged. The threshold of pain tolerance is different for each individual. There are several things that affect a person's perception of pain threshold such as age, gender, emotional experience, environment, etc⁵.

Analgesic is a substance that relieves pain without causing loss of consciousness¹. On postoperative patient, analgesic would be better given before pain arises or before anesthetic effects disappear with adequate doses². In general analgesic divided into two major groups, namely opioid analgesic and non-opioid. The use of opioids is still the gold standard in the management of severe pain, including surgery. Tramadol is one type of opioid analgesics. However, the use of these drugs is associated with side effects that often appear such as nausea, vomiting, addiction, constipation, inhibition of oral intake due to impaired gastric motility, respiratory depression, hypotonic, euphoria, and sedation⁶. Therefore the use of non-opioid analgesics begin widely used, including in surgery⁷. Non-opioid analgesic is a non-steroidal anti-inflammatory drug that has a strong analgesic effect. Ketorolac is one kind of non-opioid analgesics. When compared with opioid analgesics, ketorolac more rarely in causing side effects⁸.

Experimental

The type of this research is observational analytic study or observation. The data taken is primary data. Retrieving data using cross-sectional method from medical records to compare the effectiveness of tramadol with ketorolac as an anti pain (analgesic) for the patients of post laparoscopic appendectomy.

The target population includes all the patients of post laparoscopic appendectomy in hospitals all over Indonesia that using the analgesic tramadol and ketorolac for postoperative pain relief and affordable population includes the patients of post-appendectomy at PKU Muhammadiyah Hospital of Yogyakarta which using analgesic tramadol and ketorolac to reduce pain from the 1st of January 2009 - June 30th 2010. Samples are selected by consecutive sampling namely all subjects which meet the selection criteria included in the study until the required number of subjects are fulfilled. Minimum required sample size is 15 samples for each type of drug, so that minimum sample for the whole is 30 sample.

Criteria for inclusion in this study included patients who have done laparoscopic appendectomy surgery and hospitalized at PKU Muhammadiyah hospital of Yogyakarta, using general anesthesia, and using single analgesic, tramadol or ketorolac on hour-0 posts laparoscopic appendectomy. While exclusion criteria include the patients with impaired renal function and / or liver function disorders, experiencing mental disorders, unable to communicate, aged <5 years or> 64 years, and using analgesic combination on hour-0 posts laparoscopic appendectomy.

After the data collected, then the data is processed with the software of SPSS *for Window 15.0*. Descriptive analysis is used to determine the characteristics of the data used, normality, and homogeneity of the sample population variation. If the distribution of the data is normal used *independent sample t test* and if the distribution of the data is not normal used *non parametrik mann whitney test* to find out the differences between the two groups of samples.

Result

Table 1. The Characteristic of Research Subject based on Gender and Clinical Diagnosis

Characteristics	Tramadol		Ketorolac		P
	N	%	N	%	
<i>Gender</i>					
Male	7	35%	6	33,33%	0,914
Female	13	65%	12	66,67%	
<i>Clinical Diagnosis</i>					
Acute App	9	45%	11	61,11%	0,100
Chronic App	11	55%	7	38,89%	
	20	100%	18	100%	

Table 2. The Characteristic of Research Subject based on Age and Class of Hospitalization Ward

Characteristics	Tramadol		Ketorolac		P
	N	%	N	%	
<i>Age level</i>					
Child-Teenager (5-14 th)	2	10%	3	16,67%	1,000
Young Adult (15-24 th)	7	35%	6	33,33%	
Adult (25-44 th)	8	40%	5	27,78%	
Elderly Adult (45-64 th)	3	15%	4	22,22%	
<i>Class of Hospitalization Ward</i>					
VIP	5	25%	2	11,11%	0,464
Class I	6	30%	3	16,67%	
Class II	3	15%	6	33,33%	
Class III	6	30%	7	38,89%	
	20	100%	18	100%	

Table 3. The Characteristic of Research Subject based on The Length of Patient Treatment

Analgesic Drug	N	The average of the length of patient treatment (day)	Std. Deviation (SD)	P
Tramadol	20	3,75	1.77	0,673
Ketorolac	18	3,72	1.56	

In this study, subject characteristics such as gender, clinical diagnosis, age, hospitalization ward, and the length of treatment is attempted to be controlled. Statistical test results have shown no significant differences on all the characteristics of the study subjects (gender, clinical diagnosis, age, hospitalization ward, and the length of treatment ($p>0,05$)).

Table 4. The Duration of pain complaint free

Analgesic Drug	N	The average of The Duration of pain complaint free (Hour)	Std. Deviation (SD)	P
Tramadol	20	6,42	3.01	0,622
Ketorolac	18	5,91	3.20	

Based on the data in Table 4, it can be seen that the average of the duration of pain complaint free laparoscopic appendectomy patients after the giving of analgesic tramadol on hour-0 post surgery is 6.42 hours (6 hour 25 minute) with standart deviation 3.01, while the average of the duration of pain complaint free laparoscopic appendectomy patients after the giving of analgesic ketorolac on hour-0 post surgery is 5,91 (5 hour 54 minute) with standart deviation 3.20.

The result of statistical test with *independent t-test* to the average duration of patient pain complaint free of laparoscopic appendectomy after the providing of analgesic tramadol or ketorolac on hour-0 postoperative obtained significance number 0,622. Because $p>0,050$ ($p=0,622$), then the test results are not significant. This indicates no significance differences on the average duration of pain complaint free between two groups.

Discussion

The providing of analgesic in the treatment of post-surgical pain is a common operational standard that has been done. In general, analgesics are given before surgery (*preemptive analgesia*), then at the end of the surgery (hour-0 postoperative), and postoperative (*rescue analgesic*)⁹.

In this research, is conducted the measurement on the level of effectiveness of analgesic tramadol and ketorolac which given on hour-0 postoperative laparoscopic. The analgesic effectiveness is measured through the duration of patient pain complaint free after the patient is conscious from anesthetic. The longer duration of patient pain complaint free, means more effective these analgesics in the management of post-surgical pain.

The results of this research indicate that tramadol and ketorolac have the same level of effectiveness in the management of pain post laparoscopic appendectomy. There is no significance differences on the average duration of patient pain complaint free between two group ($p>0,05$). Despite the difference in the average duration of pain complaint free between analgesic tramadol with analgesic ketorolac, that is 0.51 hour (30 minute 36 second), this is not a great difference and significant between both of them. The longer duration of patient pain complaint free, means more effective these analgesics in the management of patient pain.

The best duration of *mean plasma concentration* for ketorolac given by parenteral lasts between 1 hour to 5 hour. Levels in plasma will reach a peak within 1 hour, then will last for 5 hour, then will go down gradually to be eliminated¹⁰. While the best duration of *mean plasma concentration* for tramadol given by parenteral lasts between 0,75 hour - 5,5 hour¹¹. This possibility caused the effectiveness of tramadol with ketorolac in this study is comparable.

The effective management of postoperative pain will restore body functions (like motion of breath, coughing, and even moves) patient more quickly, so that the healing process will go faster. This will make the patient feel comfortable because free of pain, as well as reduce the risk of postoperative morbidity and mortality¹².

Pain complaint is subjective and quality perception of pain is different for each individual. There are several things that can affect the subjectivity, among others: age, gender, psychological, emotional experience of someone in the past associated with pain, the level of tissue damage, and the circumstances surrounding the patient that can relieve or aggravate the pain complaint (environmental factors)⁵. In this research, many factors that influence the process of the research and the result of the research. Due to the limitations in the study, then there are several factors that can not be controlled entirely by researchers, among others: the psychological of postoperative patients, emotional experience of someone in the past associated with pain, *pre-emptive analgesia*, and weight of the patient.

Conclusion

Based on the research that has been conducted, it can be concluded that tramadol (opioid) with ketorolac (NSAIDs) as an analgesic, have the same level of effectiveness in the management of pain postoperative appendectomy.

Suggestion

1. Consideration of the use of a single analgesic drug tramadol or ketorolac should be based on a clear indication provision with also considering contraindications, dosage, and side effects of the drug.
2. Continuing this research with primary research observation by cohort design to further minimize possible biases.
3. Further research need to be conducted with more number of sample appropriate with the calculation in order to show more tangible results.
4. The writing of medical record is expected more complete.

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