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CHARACTERISTICS OF PONV POST LAPAROTOMY GIVEN THE COMBINATION OF DEXAMETHASONE AND ONDANSETRON AT RSUD Dr. H. CHASAN BOESOIRIE

Nazla Fajriyah Albaar[1*], Muh. Dahlan[2], Eko Sudarmo D. Prihanto[3]
[1]Medical Study Program, Faculty of Medicine, Khairun University, Ternate, Indonesia
[2]Department of Anesthesiology, Faculty of Medicine, Khairun University, Ternate, Indonesia
[3]Department of Internal Medicine, Faculty of Medicine, Khairun University, Ternate, Indonesia

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ABSTRAK

Abstract:
BabiPostoperative nausea and vomiting (PONV) are unpleasant conditions by patients and side effects of post laparotomy anesthesia. The combination of dexamethasone and ondansetron is one of the antiemetic drug combinations that can handle PONV. This study aims to find characteristics of the post laparotomy PONV given the combination of dexamethasone and ondancetron at RSUD Dr. H. Chasan Boesoirie based on age, gender, type of laparotomy, duration of surgery, type of anesthesia, and ASA status. This study uses a descriptive observational with a cross-sectional design approach conducted prospectively. The data collection tools used in this study were RINVR questionnaire and patient status. The result is category that did not nausea and vomiting was the highest post laparotomy. Laparotomy was most commonly performed in the age group of 56-65 years (37.5%) with a female predominance (51.8%), the highest type of laparotomy was appendicectomy (44.6%) with the duration of laparotomy mostly occurring >120 minutes (37.5%). General anesthesia was the most common type of anesthesia used in laparotomy (69.6%). ASA II category was found to be the most (94.6%). So it is concluded that the most of the samples did not experience PONV after being given a combination of dexamethasone and ondansetron post laparotomy at RSUD Dr. H. Chasan Boesoirie.

***Abstrak*:**
Mual dan muntah pasca operasi merupakan kondisi tidak menyenangkan oleh pasien dan efek samping dari anestesi pasca laparotomi. Kombinasi deksametason dan ondansetron menjadi salah satu kombinasi obat antiemetik yang mampu menangani PONV. Penelitian ini bertujuan untuk mengetahui karakteristik PONV pasca laparotomi yang diberikan kombinasi deksametason dan ondansetron di RSUD Dr. H. Chasan Boesoirie berdasarkan usia, jenis kelamin, jenis laparotomi, durasi operasi, jenis anestesi, dan status ASA. Metode penelitian ini yaitu observasional deskriptif dengan pendekatan cross sectional dilakukan secara prospektif. Alat pengumpulan data menggunakan kuesioner RINVR dan status pasien. Kategori yang tidak mengalami mual muntah menjadi kategori paling tinggi setelah laparotomi. Hasilnya adalah laparotomi paling banyak pada kelompok usia 56-65 tahun (37.5%) dengan dominasi perempuan (51,8%), jenis laparotomi paling tinggi yaitu tindakan apendiktomi (44,6%) dengan durasi operasi tindakan laparotomi paling banyak terjadi, yaitu >120 menit (37,5%). Anestesi umum menjadi jenis anestesi yang paling sering digunakan pada laparotomi (69,6%). Kategori ASA II didapatkan kejadian terbanyak pada sampel penelitian (94,6%). Maka disimpulkan sebagian besar sampel tidak mengalami PONV setelah diberikan kombinasi deksametason dan ondansetron pasca laparotomi di RSUD Dr. H. Chasan Boesoirie.

Corresponding Author:
Nazla Fajriyah Albaar,
Medical Study Program, Faculty of Medicine
Khairun University,
Ternate, Indonesia.
Email: nazlalbaar@gmail.com

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INTRODUCTION

Laparotomy is one of the major surgical procedures by making an incision in the abdominal wall layer that experiences problems such as bleeding, perforation, cancer, and obstruction in the abdominal area [1]. Laparotomy procedures in Indonesia ranked 5th in 2018. There were a total of 1.2 million surgeries and an estimated 42% of them were laparotomies [2]. Post operative nausea and vomiting (PONV) is one of the side effects after the administration of postoperative anesthetic drugs. The incidence of PONV in Indonesia has not been clearly recorded. One PONV study in Indonesia showed that the incidence of PONV in laparotomy and gynecology was 31.25% and mastectomy was 31.4% [3].

Fourth consensus guidelines for the management of postoperative nausea and vomiting (PONV) explains that perioperative glucocorticoids have been used for many years to reduce the incidence of PONV. Currently the recommended dose of dexamethasone ranges between 4 and 10 mg. Based on its mechanism of action dexamethasone plays a central role in the vomiting center which works to inhibit the release of prostatglandins centrally [4].

Ondancetron is the most commonly used and studied 5-HT3 receptor antagonist and is considered the gold standard in PONV management. Ondancetron has comparable antiemetic effects when used as a single drug or in combination. Ondancetron is administered at a dose of 4 mg IV or 8 mg oral tablet with bioavailability. Based on its mechanism of action ondancetron is centered in the chemoreceptor trigger zone (CTZ) and peripheral parts of the gastrointestinal tract (GI). Several experimental studies in the combination of these 2 drugs have proven effective in preventing PONV [4].

Combinations of drugs with different mechanisms and sites of action are used to achieve the maximum antiemetic effect and to reinforce each other. The 5-HT3 receptor antagonist (ondansetron) is commonly used alone or in combination with dexamethasone 4 or 8 mg and forms the antiemetic prophylaxis for surgery. In several studies of the combination of a 5-HT3 receptor antagonist (ondancetron) and dexamethasone the results were that the combination therapy resulted in a significant reduction in the risk of PONV and a lower need for antiemetics compared with the 5-HT3 receptor antagonist (ondancetron) alone. The addition of a single dose of 8 mg dexamethasone combined with ondancetron significantly reduced the incidence of PONV at 24 hours to 72 hours postoperatively without an increase in adverse effects [4].

The discussion above shows that the effectiveness of giving a combination of dexamethasone and ondancetron is successful in minimizing and preventing the incidence of PONV. Therefore, research on the characteristics of PONV after laparotomy given a combination of dexamethasone and ondansetron at RSUD Dr. H. Chasan Boesoirie will provide benefits in the selection of rational antiemetic drugs and as good premedication.

RESEARCH METHOD

This study uses a descriptive observational with a cross-sectional design approach conducted prospectively. The sample (n=56) in this study were all patients laparotomy who met the inclusion criteria (patients with laparotomy using a combination of dexamethasone and ondancetron as PONV premedication, aged 17-65 years, laparotomy duration <30 minutes to >120 minutes, ASA status I II III and who signed the informed consent). Patients with exclusion criteria (pregnant patients, post laparotomy patients using ventilators, history of diabetes mellitus and those who did not sign the informed consent).

The sampling technique used purposive sampling. This research was

conducted at the Surgical Inpatient Installation of RSUD Dr. H. Chasan Boesoirie Ternate. Data collection time was carried out in September to October 2023. Instrument in study this is a questionnaire and patient status. The questionnaire used is the Rhodes Index Nausea, Vomiting, and Retching (RINVR) questionnaire which is a standardized questionnaire that used in research related to the incidence of PONV. The questionnaire was given 6 hours post laparotomy and then used patient status to see the post laparotomy anesthesia report. The data obtained were then processed using the Statistical Package for the Social Science (SPSS). Then analyzed with the use univariate analysis method to describe the characteristics.

RESULT AND DISSCUSION

The results of this study are based on research conducted at the Surgical Inpatient Installation of RSUD Dr. H. Chasan Boesoirie from September 7 to October 23, 2023. A total of 56 samples were obtained that met the inclusion criteria. Characteristics samples as follows:

Table 1.
Characteristics of Samples

Variable	(n)	(%)
PONV		
0 = none	53	94,6
1-8 = mild	0	0
9-16 = moderate	3	5,4
17-24 = severe	0	0
25-32 = great	0	0
Age (Year)		
17-25	11	19,6
26-35	8	14,3
36-45	10	17,9
46-55	6	10,7
56-65	21	37,5
Gender		
Female	29	51,8
Male	27	48,2
Types of Laparotomy		
Herniotomy	10	17,9
Gastrectomy	3	5,4
Cholecystectomy	10	17,9
Hepatectomy	2	3,6
Splenorrhaphy	0	0
Appendicectomy	25	44,6
Colostomy	6	10,7
Esophagomyotomy	0	0
Duration of Laparotomy (Minutes)		
<30	0	0
30-60	9	16,1
61-90	6	10,7
91-120	20	35,7
>120	21	37,5
Types of Anesthesia		
General	39	69,6
Regional	17	30,4
ASA Status		
I	0	0
II	53	94,6
III	3	5,4

Based on Table 1 characteristics. Most (94.6%) did not have PONV, the age of those who underwent laparotomy was mostly found in the age of 56-65 years (37.5%), women dominated (51.8%) and appendicectomy (44.6%) was the most common laparotomy case. Duration >120 minutes (37.5%) was the most common duration of surgery. Most laparotomies used general anesthesia (69.6%) and status asa II (94.6%) was the most common.

PONV Distribution Characteristics

Based on the distribution of PONV variables in table 1, 53 samples did not have PONV and 3 samples were included in the moderate PONV category. Research conducted in 2018 at the Surgical Installation of Dr. Moewardi Surakarta Hospital also experienced something similar, namely the combination group of dexamethasone and ondancetron had the highest number of samples that did not have PONV compared to the granisetron group [5].

This depends on the risk factors for PONV, the dose response detected, the type of anesthesia and the duration of anesthesia that will affect the incidence of PONV will increase or not. However, the combination of dexamethasone and ondancetron in the management of PONV has been recommended by the International Anesthesia Research Society (IARS). According to IARS, the use of antiemetic drugs in combination is more effective in preventing PONV because no antiemetic drug is able to block all pathways to the vomiting center. Based on its mechanism of

action dexamethasone plays a central role in the vomiting center which works to inhibit the release of prostatglandin centrally [6]. Based on its mechanism of action ondancetron is centered in the CTZ and peripheral parts of the gastrointestinal (GI) tract. Several experimental studies in the combination of these 2 drugs have proven effective in preventing PONV. The combination of antiemetic drugs can minimize the incidence of PONV [4].

Age Distribution Characteristics

Based on the distribution of age variables in Table 1, those who underwent laparotomy in the age category of 56-65 years were 21 samples, which is the highest age category in laparotomy in this study. This is in line with the research in 2022 conducted in the Central Surgical Installation Room of Ajibarang Hospital, Central Java with the late elderly age category (>55 years) being the highest age category in laparotomy [7]

Laparotomy mostly in this age group due to the reduction of supporting tissue to the muscles along with the increasing disease suffered, lack of fiber consumption, organ systems that begin to experience decreased organ function, and uncontrolled diet and unhealthy lifestyle [8].

Gender Distribution Characteristics

Based on the distribution of gender variables in table 1, there are more women than men. In this study, the category of moderate PONV was dominated by the female sex (2 samples were female and 1 sample was male). Research conducted in 2022 at Ulin Banjarmasin Hospital also explained that the female gender was more than male [9]. Similar research results were also conducted in 2020 at the Department of Anesthesia Combined Military Hospital Pakistan [10].

Women estrogen is the main hormone and this hormone can stimulate dopamine receptors in CTZ. This causes the stimulation of nausea and vomiting, one of which is easy blood circulation through dopamine receptors because dopamine is sensitive to the presence of estrogen in the blood so that the incidence of PONV can increase [4].

Type of Laparotomy Distribution Characteristics

Based on the distribution of laparotomy type variables in table 1, appendicectomy was the most common type of laparotomy, there are 25 samples, then herniotomy with a diagnosis of inguinal hernia. This is in line with research conducted in 2023 at Meuraxa Banda Aceh Hospital that post laparotomy patients with a diagnosis of appendicitis were the most common and then the second most common diagnosis of inguinal hernia [11].

The incidence of appendicitis in Indonesia is one of the causes of acute abdominal pain and several emergency indications for abdominal surgery. The incidence of appendicitis in Indonesia is the highest among other gastrointestinal emergencies [12]. Based on epidemiologic studies, 75% of abdominal hernias are inguinal hernias. Inguinal hernia is the most common cause after appendicitis [13].

Duration of Laparotomy Distribution Characteristics

Based on the variable distribution of the duration of surgery in Table 1, the duration of >120 minutes is the highest, which is around 21 samples who underwent laparotomy. This is in line with the research in 2018 if the dexamethasone and ondansetron combination group with a maximum laparotomy duration of 280 minutes [5].

This could affect the incidence of PONV related to the duration of surgery. Surgery that lasts more than an hour will increase the risk of PONV compared to surgery that lasts less than an hour. Postoperative surgery with a long duration makes the patient less mobile which causes blood clots and dizziness that can disrupt

balance in the vestibular system. This instability can result in CTZ activation on the vestibular nerve which serves as a trigger for PONV [14].

Type of Anesthesia Distribution Characteristics

Based on the distribution of anesthesia type variables in Table 1, those who underwent laparotomy mostly used general anesthesia with a frequency of 39 samples, of which there were 2 samples who experienced moderate PONV.

This is because laparotomy is a major surgery that requires patient calmness with a long surgical time. Using general anesthesia for major surgery is one of the goals of general anesthesia (a combination of hypnotic drugs to maintain anesthesia, analgesics for pain and muscle relaxation). However, there are some types of laparotomy that use regional anesthesia such as herniotomy (inguinal hernia) with regional anesthesia using the neuroaxial block technique or with spinal anesthesia involving surgery on the colon. However, in laparotomy, general anesthesia is often used rather than regional anesthesia [15].

The high incidence of PONV in patients under general anesthesia may be due to increased abdominal distension due to gas exchange introduced into the gastrointestinal tract during mask ventilation. This can stimulate mechanoreceptors found in the muscle wall of the gastrointestinal tract and send signals to the vomiting center [16].

ASA Status Distribution Characteristics

Based on the distribution of ASA status variables in table 1, 53 samples were obtained with ASA status II and III samples with ASA status III. Similar results were also obtained in the research in 2021 at RSUD Dr. H. Chasan Boesoirie Ternate that the highest sample was obtained in samples with ASA status II, namely 64 samples [17]. But this is not line reaserch in 2021 if ASA I is the most [18].

The higher the patient's ASA status, the more severe the patient's systemic disorders will be. This causes the response of the body's organs to the drug or anesthetic agent to be slower, resulting in a longer duration of anesthesia and can be one of the risks of PONV [19]. The more severe the systemic disorder, the more complications that will increase the risk of PONV [20].

CONCLUSION

Based on this study, after being given a combination of dexamethasone and ondansetron as premedication for PONV post laparotomy, 53 samples were found not to experience PONV with a percentage of 94.6%. This can illustrate that the combination of dexamethasone and ondansetron can minimize the incidence of PONV.

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