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The Effect of Metoclopramide and Dexamethasone on Nausea and Vomiting in CESAREANSECTION Under Spinal Anaesthesia.

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ABSTRACT

Background: Postoperative nausea and vomiting are prevalent issues among those who have had surgery. Inadequate prevention of these problems might result in heightened morbidity, extended duration in the postoperative recovery unit, and unforeseen hospitalisation.

Objective: Our study was contributed to analyse and assess outcomes related to the effect of metoclopramide and dexamethasone on nausea and vomiting in patients with the caesarean section under spinal anaesthesia.

Patients and methods: Regarding the outcomes of pregnant women who underwent cesarean section, our results identified an across-sectional study that determine the role of metoclopramide and dexamethasone in reducing nausea and vomiting in women who underwent the procedure under spinal anesthesia during a period extended from 12th March 2022 to 27th September 2023. Clinical data for the collected samples from different hospitals in Iraq, which included 80 patients aged between 25 and 40 years, were collected and divided into two groups. Group A represents the women who took 8 mg of dexamethasone, while Group B represents the group who took 10 mg of metoclopramide, which included 40 other women. This study determined the number of patients experiencing nausea and vomiting in both groups within 90 minutes after spinal anesthesia.

Results: Clinical data showed that women in Group A, whose ages were (35-40) years, were the highest in performing the procedure, which included 15 women, and Group B included 18 women. The results of postoperative complications found seven women out of the total average of the samples, and they were in Group A and 8. Women out of the overall rate, and the most common among women were infections, blood clots, and breathing difficulties. These results recorded data on the rate of patients who had nausea and vomiting, as in group A, it was found in 1 minute and included four women, 2 in 10 minutes, and a woman in 15 minutes, 3 in 30. One minute, one woman in 60 minutes, and two women in 90 minutes. On the contrary, our results were found in group B, which included five women in 1 minute, three women in 10 minutes, 1 in 15 minutes, 1 in 30 minutes, 2 in 60 minutes, and two other women in 90 minutes.

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Conclusion: The clinical findings indicated that dexamethasone was more effective than metoclopramide in lowering nausea and vomiting in pregnant women undergoing a caesarean section performed under spinal anaesthesia.

KEYWORDS: Spinal anesthesia; Caesarean section; Metoclopramide; and Dexamethasone; Postoperative nausea and vomiting (PONV).

INTRODUCTION

The incidence of postoperative nausea and vomiting has remained static during the last twenty years despite the use of short-acting anesthetics and the execution of minimally invasive surgeries, most of which are performed in an outpatient context. [1]

The use of prophylactic antiemetic drugs produces greater satisfaction in patients than the treatment of established symptoms of nausea and vomiting in the postoperative period [2]. However, a great controversy has been generated in relation to the most cost-effective antiemetic treatment in routine prophylaxis. [3]

Despite the large pharmacological arsenal available, it has not been possible to win the war against postoperative nausea and vomiting, and the efforts undertaken daily in the anaesthetic and surgical recovery rooms are not only won with the use of the most expensive drugs also with those that demonstrate their effectiveness at a moderate cost and with their intelligent use; one of these drugs is dexamethasone, a long-acting corticosteroid that, apparently, can reduce the incidence of PONV [4-7]. However, its usefulness to prevent postoperative nausea and vomiting in patients operated with intrathecal neuraxial anesthesia and to whom abdominal hysterectomy is performed has not been determined [8]. It is likely that dexamethasone performs its antiemetic action by the central effect on the nucleus of the solitary tract, interaction with serotonin and the receptor proteins tachykinin NK1 and NK2, with its anti-inflammatory effect, but its mechanism of action to exert this effect remains unknown. [9,10]

The results of multifactorial design studies suggest that antiemetics with different mechanisms of action have additive effects on the incidence of postoperative nausea and vomiting [11]. The low cost and excellent safety profile of dexamethasone have made it a highly cost-effective strategy in the prevention of this adverse event [12]. Metoclopramide is a medication that has been used for 40 years in the prevention of postoperative emesis. That it is a very low-cost drug; at a dose of 10 mg IV, it has a reduced incidence of adverse events; however, its low prophylactic antiemetic relevance. [13]

The bimodal therapy that is the proposal of this study is the combination of these two drugs at the pre-anesthetic level, with the purpose of reducing the incidence of postoperative nausea and vomiting, which remains constant in the general population, by about 20 to 30% and being able to reach up to 70 to 80% in high-risk patients [14]. Nausea and vomiting are indicators of poor anesthesia quality that generate high in-hospital medical costs and increase morbidity and mortality [15]. Single-drug prophylaxis reduces the incidence of nausea and vomiting by approximately 30%; if we use the bimodal approach, minimizing the risk factors associated with anesthesia is reduced by up to 90%. [16]

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PATIENTS AND METHODS

A cross-sectional study was conducted on pregnant women who underwent cesarean section, which included 80 patients. Where these samples were collected from different hospitals in Iraq during the period extended from 12th March 2022 to 27th September 2023. Our study identified data to evaluate and analyse the effect of metoclopramide and dexamethasone on patients who developed nausea and vomiting after cesarean section under spinal anesthesia. Our study collected clinical data for women who underwent cesarean section and whose ages ranged between 25-40 years. Our study recorded demographic data for the collected samples, which included 80 women, which included age, body mass index, comorbidities, level of education, employment status, and smoking status.

This study identified clinical data for patients who underwent a cesarean section and were exposed to nausea and vomiting after the operation, which strengthened our study in distributing the effect of both metoclopramide and dexamethasone by dividing the collected samples into two parts where group A included 40 women who took 8 milligrams of dexamethasone, while group B represented the group of women who took 10 mg of metoclopramide, which included 40 other women.

This study collected clinical data for pregnant women during a cesarean section in terms of operation time, gestational age, child weight ranging from (1500 - 3000) grams, previous history of pregnancy, admission to the intensive care unit, number of children, length of stay in the hospital, and recovery time.

Our results identified patients' post-cesarean section complications for both groups. Furthermore, the number of patients experiencing nausea and vomiting in both groups was determined within 90 minutes after spinal anesthesia. Also, the heart rate and blood pressure of patients in both groups were measured within 90 minutes after spinal anesthesia. In addition, this study was designed and structured on the clinical outcomes of pregnant women using the SPSS program. This current study excluded patients who had previous surgeries, had chronic diseases, or were older than 40 years of age.

RESULTS

Table 1: Clinical demographic characteristics of patients in this study.

Characteristics	Group A [Dexamethasone] (40 patients)	Group B [Metoclopramide] (40 patients)	P-value
Age			0.382
25 – 29	11 [27.5%]	9 [22.5%]	
30 – 34	14 [35%]	13 [32.5%]	
35 - 40	15 [37.5%]	18 [45%]	
BMI [kg/m2]			0.301
< 29.5	10 [25%]	8 [20%]	
29.5 – 31.5	14 [35%]	14 [35%]	
> 31.5	16 [40%]	18 [45%]	
ASA			0.360
I	36 [90%]	34 [85%]	
II	4 [10%]	6 [15%]	

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Comorbidities			0.0327
Non	12 [30%]	13 [32.5%]	
Hypertension	8 [20%]	10 [25%]	
Diabetes mellitus type 2	7 [17.5%]	7 [17.5%]	
Cardiovascular disease	6 [15%]	5 [12.5%]	
Thyroid disease	4 [10%]	3 [7.5%]	
Acute asthma	3 [7.5%]	2 [5%]	
Education status			0.0342
Primary school	9 [22.5%]	8 [20%]	
Secondary school	11 [27.5%]	13 [32.5%]	
Graduated college	20 [50%]	19 [47.5%]	
Occupation status			0.358
Employed	17 [42.5%]	16 [40%]	
Unemployed	23 [57.5%]	24 [60%]	
Smoking during pregnancy			0.0352
Yes	4 [10%]	3 [7.5%]	
No	36 [90%]	37 [92.5%]	

Table 2: Pre-operative and intra-operative findings for pregnant women.

Variables	Group A [Dexamethasone] (40 patients)	Group [Metoclopramide] (40 patients)	P-value
Operative time	52.2 ± 8.4	54.7 ± 6.3	0.048
Gestational age (week)	37.4 ± 1.6	37.2 ± 1.8	0.05
Type of delivery			
Cesarean section	40 [100%]	40 [100%]	0.05
Child weight [g]			0.034
1500 - 2000	4 [10%]	6 [15%]	
2001 - 2500	14 [35%]	12 [30%]	
2501 – 3000	20 [50%]	14 [35%]	
Previous history of pregnancy			0.023
0	13 [32.5%]	14 [35%]	
1	16 [40%]	12 [30%]	
2	4 [10%]	10 [25%]	

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3	7 [17.5%]	4 [10%]	
ICU admission			0.0242
Yes	3 [7.5%]	4 [10%]	
No	37 [92.5%]	36 [90%]	
Number of children			0.0498
Singleton	98 [95%]	39 [97.5%]	
Twin	2 [5%]	1 [2.5%]	
Length of stay, Cesarean section, days	3.1 ± 0.4	3.2 ± 0.3	0.0488
Recovery time, [Week]	4.2 ± 0.8	5.1 ± 1.2	0.0424

Table 3: Post-operative complications outcomes.

Complications	Group A [Dexamethasone] (40 patients)	Group [Metoclopramide] (40 patients)	P-value
Infection	2 [5%]	2 [5%]	0.05
Bleeding	1 [2.5%]	1 [2.5%]	0.05
Adhesions	1 [2.5%]	1 [2.5%]	0.03
Breathing difficulties	2 [5%]	2 [5%]	0.05
Blood clots	1 [2.5%]	2 [2.5%]	0.05
Total	7 [17.5%]	8 [22.5%]	0.032

Table 4: Determine the number of patients with nausea and vomiting in both groups during the 90 minutes after spinal anesthesia.

Time (minutes)	Group A [Dexamethasone] (40 patients)	Group [Metoclopramide] (40 patients)	P-value
1 min	4 [10%]	5 [12.5%]	< 0.01
10 min	2 [5%]	3 [7.5%]	< 0.01
15 min	1 [2.5%]	1 [2.5%]	0.05
30 min	3 [7.5%]	1 [2.5%]	< 0.01
60 min	1 [2.5%]	2 [5%]	< 0.01

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90 min	2 [5%]	2 [5%]	0.05

Table 5: Heart rate and blood pressure measurements of patients in both groups.

Variables	Group A [Dexamethasone] (40 patients), mean ± SD	Group [Metoclopramide] (40 patients), mean ± SD	P-value
Heart rate			
1 min	109..25 ± 26.88	109.66 ± 24.67	0.570
10 min	110.28 ± 22.10	109.54 ± 21.34	0.752
15 min	114.30 ± 18.45	112.62 ± 21.5	0.303
30 min	112.26 ± 17.55	113.16 ± 19.88	0.960
60 min	109.48 ± 15.92	112.78 ± 18.07	0.178
90 min	104.60 ± 20.87	99.10 ± 16.08	0.082
Blood pressure			
1 min	97.48 ± 2.83	98.44 ± 1.07	0.178
10 min	98.20 ± 1.83	100.3 ± 1.02	0.289
15 min	98.66 ± 1.48	98.80 ± 1.46	0.458
30 min	98.38 ± 1.53	98.60 ± 1.58	0.580
60 min	97.55 ± 1.67	96.36 ± 1.20	0.0284
90 min	98.40 ± 1.34	98.67 ± 1.12	0.477

DISCUSSION

Clinical data showed that women in Group A who were aged (35-40) years were the most likely to undergo the procedure, which included 15 women, and Group B included 18 women, with an average BMI of women who had BMI of > 31.5, and 16 women in Group A and 18 women in Group B. Comorbidities recorded as Type 2 diabetes were the most common in Group A with a rate of 8 women, and Hypertension was the highest recorded with ten women, with four women in Group A and three women in Group B who were exposed to smoking during pregnancy.

Our study recorded the results of pregnant women during a cesarean section, where the surgery time ranged between (45 minutes - an hour), Gestational age (week) included 37.4 ± 1.6, and the weight of the child (2500 - 3000) was the most normal, as it included 20 women in group A and 14 women. For group B, our results found three women in group A and four women in group B who were admitted to the intensive

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care unit, where the duration of their stay in the hospital was between (2 - 3) days. The results of the women who gave birth to twins were determined, which included two women in group A and one woman in group B.

This study recorded the results of post-surgical complications, as it found seven women out of the total average of the samples and they were in group A, and eight women out of the total average, and the most common among women were infections, blood clots, and breathing difficulties. Furthermore, these results data recorded the rate of patients who had nausea and vomiting, where in group A, 1 minute included four women, 2 in 10 minutes, one woman in 15 minutes, 3 in 30 minutes, one woman in 60 minutes, and two women in 90 minutes. On the contrary, our results were found in group B, which included five women in 1 minute, three women in 10 minutes, 1 in 15 minutes, 1 in 30 minutes, 2 in 60 minutes, and two other women in 90 minutes.

The heart rates recorded in Group A were 109.25 ± 26.88, minute 10 was 110.28 ± 22.10, minute 15 were 114.30 ± 18.4, minute 30 were 112.26 ± 17.55, minute 60 were 109.48 ± 15.92, and minute 90 were 104.60 ± 20.87. In group B, the results for minute 1 were 109.66 ± 24.67, minute 10 were 109.54 ± 21.34, minute 15 were 112.62 ± 21.5, minute 30 were 113.16 ± 19.88, minute 60 were 112.78 ± 18.07, and minute 90 were 99.10 ± 16.08. Regarding blood pressure rates, group A showed that at minute 1 it was 97.48 ± 2.83, minute 10 was 98.20 ± 1.83, minute 15 was 98.66 ± 1.48, minute 30 was 98.38 ± 1.53, minute 60 was 97.55 ± 1.67, and minute 90 was 98.40 ± 1.34, while group B found that minute 1 was 98.44 ± 1.07, minute 10 was 100.3 ± 1.02, minute 15 was 98.80 ± 1.46, minute 30 was 98.60 ± 1.58, minute 60 was 96.36 ± 1.20, and minute 90 was 98.67 ± 1.12.

Many studies have recorded the effect of dexamethasone and metoclopramide as antidotes to prevent or reduce the occurrence of nausea and vomiting [17]. However, another study reinforced the effectiveness of dexamethasone as a drug in treating all pregnant women, whether at high risk or low risk, especially in reducing the severity of PONV and its treatment compared to metoclopramide [18,19]. Moreover, an American study noted that using dexamethasone as a drug prevents nausea and vomiting, whether alone or when used with other antiemetics. [20]

CONCLUSION

Although our results found high incidences of nausea and vomiting after the operation, the use of dexamethasone 8 mg and metoclopramide 10 mg is safer in preventing the occurrence of nausea, vomiting, heart palpitations, and blood pressure for pregnant women under spinal anesthesia. Moreover, the current study indicated the superiority and effectiveness of dexamethasone over metoclopramide as an antiemetic effect in reducing PONV compared to metoclopramide.

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