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Original Research Article

Effectiveness of Acupressure and Ondansetron in Prevention of Nausea and Vomiting Following The Use of Carboprost During Caesarean Section Under Spinal Anaesthesia: A Randomised Comparative Study

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Abstract:

Background: Uterotonics like carboprost used during lower segment caesarean section in patients under spinal anaesthesia to prevent postpartum hemorrhage (PPH) can cause perioperative nausea and vomiting which can results in patient discomfort, increase risk of intraoperative bleeding and increase wound pain.

Objectives: To study the effectiveness of acupressure and ondansetron in prevention of nausea and vomiting following the use of carboprost in patients undergoing lower segment caesarean section under spinal anaesthesia. **Methods:** A prospective randomized and comparative study was carried out in 100 parturients aged 18 to 45 year of ASA physical status I and II, Gestation age ≥36 weeks scheduled for elective LSCS under spinal anesthesia. All patients were divided into two groups with 50 patients in each group. In Group A patients unilateral Acupressure wrist sea band applied for P6 stimulation just before spinal anaesthesia and in Group O that is antiemetic group patients received injection ondansetron 4 mg intravenously just before spinal anaesthesia.

Results: Data was entered in MS EXCEL and analysed using latest version of Statistical Package for Social Sciences (SPSS). The incidence of intra-operative nausea was 30% and 24% and incidence of vomiting was 18% and 12% in Group A and Group O respectively. Incidence of intraoperative nausea and vomiting remain comparable in both the groups (P>0.05). Incidence of postoperative nausea was 22% and 14% and incidence of vomiting was 14% and 8% in Group A and Group O respectively and remain comparable in both the groups (P>0.05). In our study, the incidence and severity of nausea and vomiting were similar in p6 group and antiemetic group and were not statistically significant (p>0.05).

Conclusion: Acupressure to the P6 point is a low cost, simple method as effective as ondansetron to reduce the incidence of nausea and vomiting during intra operative and postoperative period in parturients undergoing LSCS under spinal anesthesia.

Keywords: Acupressure, Ondansetron, Carboprost, Nausea, Vomiting, Caesarean Section.

Introduction

Caesarean section is the commonly performed operative procedure in the field of obstetrics. [1] One of the complications that occur following caesarean section which causes a significant risk to mother's life is postpartum hemorrhage (PPH). [2] Various uterotonic agents include oxytocin, ergotamines and prostaglandin analog such as carboprost used to reduce the incidence of PPH. [3] The most common and distressful complication of the use of uterotonic is the occurrence of nausea and vomiting. [4] Intraoperative vomiting causes significant challenges for the obstetrician & anesthesiologist such as increased risk of bleeding, surgical duration, inadvertent surgical trauma and aspiration pneumonitis. [5]

The etiology of perioperative nausea and vomiting in patients undergoing caesarean section is multifactorial. These include use of neuraxial opioids, hypotension, use of uterotonic agents and visceral stimulation during surgery. Perioperative nausea and vomiting not only cause dehydration,

electrolyte imbalance and adversely affects wound healing but also leads to increase wound pain discomfort and anxiety amongst the parturient following caesarean section.

Perioperative nausea and vomiting can be managed by pharmacological and non- pharmacological measures. Pharmacological measures including use of antiemetics such as ondansetron and metoclopramide, dexamethasone and droperidol.

Pharmacological measure even though effective but have significant side effects; this has leads to search for alternative treatment. An alternative for modern anti-vomiting medications is traditional Chinese medicine, acupressure. [6] Acupressure is Chinese millenary treatment consist of the stimulation of specific point that control flow of energy throughout the body-point P6.

Point P6 (also named Nei-guan) is one such point located on the volar side of forearm 2 cm proximal to the wrist crease between the tendon of palmaris longus & flexor carpi radialis & stimulation of this P6 point seems to reduce the risk of nausea & vomiting. [7,8]

Due to scarcity of studies, we have planned this study to compare effectiveness of acupressure at P6 point using sea band and ondansetron in the prevention of nausea and vomiting following the use of carboprost in Lower Segment caesarean section (LSCS) under spinal anesthesia.

Material And Methods

After institutional ethical committee approval and written informed consent from patients a prospective randomized and comparative study was carried out in the department of Anesthesiology at obstetric operation theatre, Panna Dhai Zanana Hospital, attached to RNT medical college, Udaipur (Rajasthan), on 100 parturients posted for elective lower segment caesarean section under spinal anesthesia.

Sample Size: Sample size was calculated on basis of previous study done by Rajaram G et al [8] with power of 80% and α error of 5%, the sample size was ≅ 43 sample in each group. To compensate for possible dropouts, 50 patients was taken in each group.

Patients within age 18 to 45 years, ASA physical status II, Gestation ≥36 weeks and scheduled for elective LSCS under spinal anesthesia were included in the study. Exclusion criteria included patient refusal, patient with coagulopathies or anticoagulant medication, any systemic disease, hypothyroidism, previous history of PONV, motion sickness, BMI >35 kg/m2 or history of vomiting within 24 h of the study. Patients received opioids, tricyclic antidepressants, droperidol, phenothiazine, metoclopramide, antacids, H2- antagonists, scopolamine, cannabinoids, antihistamines, corticosteroids or benzodiazepines within 4 hrs before the study also excluded from the study.

All patients were visited on the day prior to surgery for pre anesthetic checkup and was explained about the anesthetic technique and perioperative course. Patients who fulfilled inclusion criteria was enrolled in the study. They had randomly allocated into two equal groups of 50 patients using computer generated random numbers in opaque sealed envelope. Patients in Group A received Acupressure band on the volar side of forearm 2 cm proximal to the wrist crease, between the tendons of palmaris longus and flexor carpi radialis immediately before spinal anesthesia & until 2 hours postoperatively. The pressure of the elastic band will adjust neither to impair patient's radial or ulnar pulses, nor to impair venous return from distal. Patient in Group O received inj. Ondansetron 4 mg (2 ml) intravenous (i.v.) immediately before spinal anesthesia.

Patients were kept fasting for 8 hrs before surgery. In operation theatre, all patients were preloaded with Ringer lactate 10 ml/kg after securing 20G peripheral IV cannula. Standard monitoring included non-invasive blood pressure, Pulse-oximetry and Electrocardiography had applied. Baseline parameters as non-invasive blood pressure (SBP, DBP and MAP), heart rate and peripheral oxygen saturation were recorded. Patient received either inj. ondansetron or acupressure band as per group allocation.

Subarachnoid anesthesia was administered with 0.5% heavy bupivacaine (10 mg) at L3-L4 interspace using 25G Quincke's spinal needle under all aseptic conditions in sitting position. Immediately after that patient kept in supine position. The sensory block was assessed by pin prick method with the help of a short bevelled 24G needle. Sensory block was assessed bilaterally in mid-clavicular line and no perception to pin prick had considered as sensory block. We used modified Bromage scale to assess motor block.

Supplemental oxygen at the rate of 5 L/min was administered to all the patients with face mask and patients were covered with drapes. Vital parameters such as HR, SBP, DBP and SPO2 were recorded at intervals of every 5 min for first 30 min and every 15 min for the rest of the observation period. Continuous ECG, NIBP and SPO2 were done. Hypotension was classified based on the biometric parameters of the blood pressure measurement. Systolic blood pressure less than 90 mm Hg; Mean arterial pressure less than 65 mm Hg; Diastolic blood pressure less than 40 mm hg. Hypotension was treated by fluid replacement and incremental dose of injmephentermine sulphate 6 mg iv. If hypotension occurs before delivery of baby, then

patient excluded from study as hypotension may precipitate nausea & vomiting. Heart rate < 55 was considered as bradycardia and treated by inj. atropine 0.4 mg iv. In the both groups, inj. carboprost 250 µg had administered intramuscularly at shoulder (deltoid region) after delivery of anterior shoulder of the baby.

Incidence of nausea and vomiting was recorded in both groups intraoperatively & upto 2 hr postoperatively. IONV & PONV was observed using the following grading: [9] Grade 0 = No nausea or vomiting; Grade 1 = only nausea; Grade 2 = Nausea with retching; Grade 3 =One episode of vomiting & Grade 4 = More than one episode of vomiting. Grade 3 and 4 patients were treated with Inj. dexamethasone 8 mg iv as rescue antiemetic for IONV & PONV.

Statistical Analysis: Data was entered in MS EXCEL and analysed using latest version of Statistical Package for Social Sciences (SPSS). Categorical data (qualitative) had presented as number (proportion), and compared using chi-square test. Continuous variable (quantitative) was presented as Mean ± SD, analysed and compared using student t-test. $P<0.05$ had considered statistically significant.

Observations And Results

100 patients were enrolled in the above study. Including 50 patients in acupressure wrist band group (Group A) and 50 patients in ondansetron group (Group O). In present study mean Age, mean Height, mean Weight & mean Gestational age were comparable between both study groups. (Table 1). Baseline and time zero parameters i.e, mean SBP, mean DBP, mean HR and mean MAP were comparable between both study groups ($P>0.05$). There was no significant difference in mean HR, mean SBP, mean DBP and mean MAP at various intraoperative and postoperative time interval between both study groups ($P>0.05$). There was no significant difference in grading of nausea/ retching / vomiting status intraoperatively and postoperatively between both study groups ($P>0.05$); (Table 2 & 3). There was no significant difference in episodes of vomiting intraoperatively and postoperatively between both study groups ($P>0.05$); (Fig. 1 & 2). 6 patients in Group A & 5 patients in Group O had <1 episodes of vomiting in intraoperative period. 3 patients in Group A and 1 patient in Group O had ≥2 episodes of vomiting in intraoperative period. 4 patients in Group A & 3 patients in Group O had <1 episodes of vomiting in postoperative period. 3 patients in Group A & 1 patients in Group O had ≥ 2 episodes of vomiting in postoperative period. There was no significant difference in episodes of hypotension and bradycardia between both groups.

Discussion

Nausea, retching & vomiting are common distressing complications of uterotonics agents like carboprost which are not only unpleasant but also make patient discomfortable during surgery . In severe cases it may also lead to other potentially dangerous & even lethal complication, such as pulmonary aspiration of gastric content. Intra-operative emetic symptoms during abdominal surgery under regional anesthesia are troublesome and may interfere with the procedure. Emetic symptoms have complex and multifactorial etiology and can be influenced by multiple factors such as hormonal changes, gender, age, pain, hypotension, surgical procedure & weight. An emetic therapy effective for one group of surgical patients may not be effective for different group of surgical patients undergoing different surgical procedure or anesthesia technique.

Intra operative nausea & vomiting during caesarean section under spinal anesthesia can be more troublesome as we are dealing two lives simultaneously thus effort should be made to control them. Both pharmacological and non-pharmacological methods were used to prevent peri-operative nausea and vomiting.

Dundee first noted the antiemetic use of P6 point stimulus. [10] Acupressure is a part of the Chinese system of medicine, which works on the hypothesis that there is a flow of vital energy inside the body through different pathways which is required for an organism to live and function. This vital energy is called chi or qi and pathways are called meridians. Stimulation of the specific points on the meridian results in a particular action. [11] Stimulation of P6 point hypothesized to increase hypophyseal secretion of β- endorphins and adrenocorticotropic hormone, with subsequent inhibition of the chemoreceptor trigger zone and vomiting center. [7,8]

So, the present study is designed to evaluate the effectiveness of acupressure and ondansetron to prevent carboprost induced nausea and vomiting in patient undergoing elective LSCS under spinal anesthesia. In our study two groups were comparable regarding mean age, mean weight, mean height and mean gestational age. Demographic data indicate that patients were equally distributed in both groups**.** (Table 1)

During Intra-operative period mean values of blood pressures (SBP, DBP & MAP) and heart rate remain stable and comparable at all time intervals between two groups ($p>0.05$). In our study, we excluded patients who had hypotension before delivery of baby to eliminate the incidence of nausea and vomiting due to hypotension after spinal anesthesia. No patients had incidence of

bradycardia during intra operative period. In our study total 42 patients out of 100 were experienced intra- operative nausea and vomiting. The incidence of nausea was 30% and 24% and incidence of vomiting was 18% and 12% in group A and group O respectively. Incidence of intra-operative nausea and vomiting were comparable in between the groups (P>0.05) (Table 2). Our results were comparable with study done by Levin et al [12] in which they reported 36.7% and 23.3% incidence of nausea and 16.7% and 13.3% incidence of vomiting in P6 group and antiemetic group respectively which were comparable in both groups. Similar study done by Luiza et al [13] shows that the incidence of nausea during surgery was 32% (n = 16) and 22% (n = 11) in the antiemetic control and P6 groups, respectively (p > 0.05). The incidence of vomiting was 12% (n = 6) and 8% (n = 4) in the control and P6 group respectively (p>0.05). Similar incidence of intra-operative nausea and vomiting in acupressure group also reported by studies done by Luiza et al, [13] Stein et al, [14] Duggal et al, [15] Harmon D et al [16] and Habib et al. [17]

In our study, we follow up patients 2 hours post operatively at 0 min, 30 min, 60 min, 90min and 120 min in post anesthesia care unit. Present study shows that all patients had comparable hemodynamic (SBP, DBP, MAP & HR) at all time interval between the groups (p>0.05). No patient had incidence of hypotension and bradycardia in PACU. In our study total 29 patients out of 100 were experienced post operative nausea and vomiting. The incidence of post operative nausea was 22% and 14% and incidence of vomiting was 14% and 8% in group A and group O respectively. Incidence of post operative nausea and vomiting were comparable in between the groups (P>0.05) (Table 3). Our results were coinciding with a study done by Ashraf D et al [18] in patients undergoing cesarean section. They reported incidence of post operative nausea was 20.58% and 26.7% and vomiting was 17.64% and 11.76% in acupressure and metoclopramide group respectively. Results were comparable between the group (p>0.05). Studies done by Rajaram et al, [8] Imtiaz D et al, [19] and Luiza et al [13] shows the similar incidence of post operative nausea and vomiting. Similarly, studies done by Duggal et al, [15] Harman D et al [16] and Habib et al [17] also shows the comparable results between acupressure and control group, however the incidence of postoperative nausea and vomiting were higher than our study as they used opiates as adjuvant to local anesthesia. The comparable incidence of nausea and vomiting in both groups confirms the effectiveness of pressure to the P6 point in reducing intra operative and post operative nausea and vomiting in patients undergoing LSCS under spinal anesthesia. The advantages of P6 stimulation as an antiemetic include its low cost, simplicity, the absence of side effects, and the fact that it cannot be transferred through the placenta or secreted in breast milk.

In present study, three (6%) patients in group A and two (4%) patients in group O had incidence of hypotension after delivery of baby, which was successfully managed by intra venous fluid. Results were statically comparable between the groups (p>0.05). No patients had incidence of bradycardia during intra operative period. None of patients had hypotension and bradycardia in post-operative period.

We conclude that acupressure to the P6 point is as effective as ondansetron to reduce the incidence of nausea and vomiting during intra operative and post-operative period. We recommend use of P6 point acupressure band as an alternative to injectable anti emetics drugs to reduce perioperative nausea and vomiting in patients undergoing LSCS.

Table 1: Distribution and comparison of age, weight and height among two study groups

Parameters (Mean±SD)	Group A	Group O	P value
Mean Age (years)	26.40±5.19	25.24±4.18	0.222
Mean weight (kg)	62.74±5.63	61.00±6.43	0.153
Mean Height (cm)	154.2±3.16	153.36±2.64	0.152
Mean Gestational age (weeks)	37.46±1.12	37.5±1.09	0.856

Independent t test applied

Table 2: Comparison of incidence of Intraoperative nausea/ retching/ vomiting among two study groups

Grading	Group A (n=50)	Group O (n=50)	P value
0	26 (52%)	32 (64%)	0.726
1	9 (18%)	7 (14%)	
2	6 (12%)	5 (10%)	
3	6 (12%)	5 (10%)	
4	3 (6%)	1 (2%)	

Chi square test applied

Table-3: Comparison of incidence of postoperative nausea/ retching/ vomiting among two study groups

Grading	Group A (n=50)	Group O (n=50)	P value
0	32 (64%)	39 (78%)	0.592
1	7 (14%)	4 (8%)	
2	4 (8%)	3 (6%)	
3	4 (8%)	3 (6%)	
4	3 (6%)	1 (2%)	

Chi square test applied

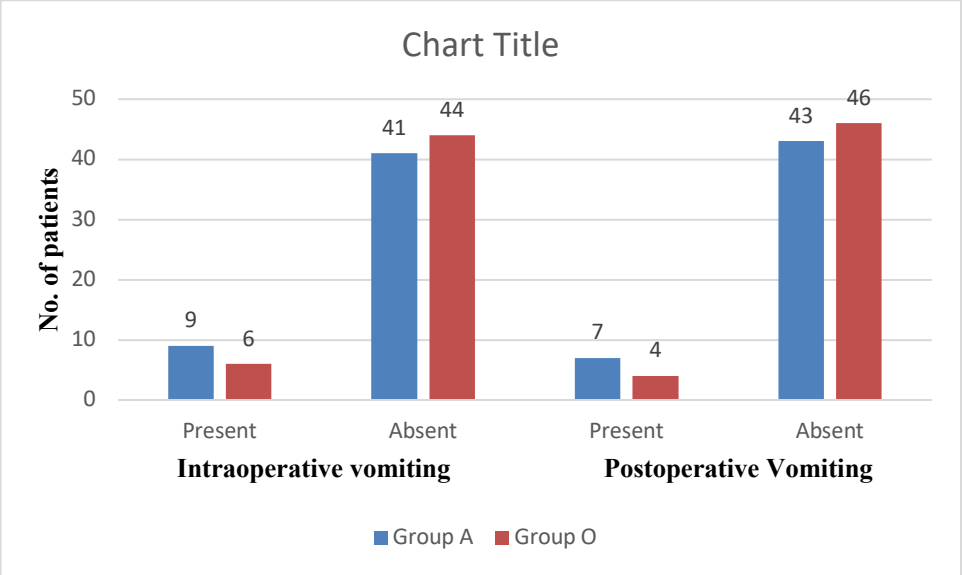

Figure 1: Incidence of intra operative and post operative vomiting among two groups intraoperatively

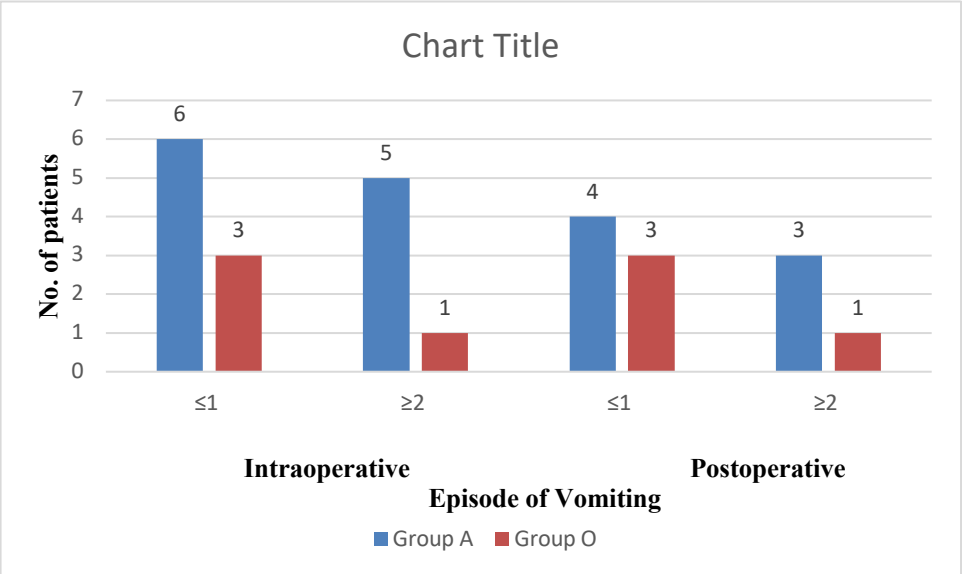

Figure 2: Incidence of intra operative and post operative episodes of Vomiting among two groups

References

1. Hema KH, Johnson R. Techniques for performing caesarean section Best Pract Res Clin Obstet Gynaccol 2001;15:17-47.
2. Say L, Chou D, Gemmill A, Tuncalp O, Moller AB, Daniels J et al. Global causes of maternal death: a WHO systematic analysis. Lancet Glob Health. 2014;2(6):323-33.
3. Begley CM, Gyte GM, Devane D, McGuire W, Weeks A. Active versus expectant management for women in the third stage of labour. Cochrane Database Syst Rev 2011; Nov 9;(11):CD007412.

4. Abouleish EI, Rashid S, Haque S, Giezentanner A, Joynton P, Chuang AZ. Ondansetron versus placebo for the control of nausea and vomiting during Caesarean section under spinal anaesthesia. Anesthesia. 1999;54(5):479-82.
5. Griffiths JD, Gyte GM, Paranjothy S, Brown HC, Broughton HK, Thomas J. Interventions for preventing nausea and vomiting in women undergoing regional anesthesia for cesarean section. Cochrane Database Syst Rev. 2012;12(9):CD007579.
6. Allen TK, Habib AS. P6 stimulation for the prevention of nausea and vomiting associated with caesarean delivery under neuraxial anesthesia. A systematic review of randomized controlled trials. Anesth Analog 2008; 107:1308-12.
7. Sameuls N. Acupuncture for nausea. How does it work? Harefuah 2003; 142:297-300.
8. Rajaram G, Raghu K, Kumar S, Nikhil N. P6 Point Acupressure versus Ondansetron in Prevention of Carboprost-induced Nausea and Vomiting. Journal of Obstetric Anaesthesia and Critical Care 2020;10(2): 87-90.
9. Wani SA, Chanda M, Prakash A, Aggarwal S. A comparison of ondansetron and p6 point acupuncture stimulation in prevention of carboprost induced nausea and vomiting in patients undergoing caesarean section under subarachnoid block. Anesth Pain Intensive Care 2015; 19:24-17.
10. Sadighha A, Nurai N. Acupressure wristbands versus metoclopramide for the prevention of postoperative nausea and vomiting. Ann Saudi Med. 2008 Jul-Aug;28(4):287-91.
11. Wieland GB, von der Laage D, Tolksdorf W. Acupressure in the prevention of postoperative nausea and vomiting. Anaesthesist 1993; 44:221-6
12. Levin D, Cohen S, Mellender S, Shah U, Kang P, Mohiuddin A, et al. Effectiveness of P6 stimulation for reduction of nausea and vomiting during caesarean section under combined spinal-epidural anaesthesia: A randomised controlled trial. Turk J Anesthesiol Reanim 2019; 47:120-7.
13. Branco LHC, Lima LC, Costa MCF, Lira MS, Coelho RQGA et al. Stimulation of the P6 acupuncture point for prophylaxis of nausea and vomiting in pregnant women submitted to cesarean section: a blinded clinical trial. Open Journal of Anesthesiology, 2013 May;3(3):161-164.
14. Stein DJ, Birnbach DJ, Danzer BI, Kuroda MM, Grunebaum A, Thys DM. Acupressure versus intravenous metoclopramide to prevent nausea and vomiting during spinal anesthesia for cesarean section. Anesth Analg 1997; 84:342–5.
15. Duggal KN, Douglas MJ, Peteru EA, Merrick PM. Acupressure for intrathecal narcotic-induced nausea and vomiting after caesarean section. Int J Obstet Anesth 1998; 7:231–6.
16. Harmon D, Ryan M, Kelly A, Bowen M. Acupressure and prevention of nausea and vomiting during and after spinal anaesthesia for caesarean section. Br J Anesth. 2000;84(4):463-7.
17. Habib AS, Itchon-Ramos N, Phillips-Bute BG, Gan TJ. Transcutaneous acupoint electrical stimulation with the Relief Band for the prevention of nausea and vomiting during and after cesarean delivery under spinal anesthesia. Anesth Analg 2006 Feb;102(2):581-4.
18. Direkvand-Moghadam A, Khosravi A. Effect of acupressure on post–operative nausea and vomiting in cesarean section: a randomised controlled trial. J Clin Diagn Res 2013 Oct; 7(10): 2247- 2249.
19. Imtiaz D, Rehman SU, Ghafoor AUR, Durrani RS, Ashfaq AD, Khan TH. A comparative study of intravenous ondansetron and P-6 acupressure for the reduction of postoperative nausea and vomiting in patients undergoing elective laparoscopic colorectal cancer surgeries. Anaesth. pain intensive care 2022; 26(2):143-147.