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ORIGINAL ARTICLE

Comparison of Epigastric Pain Between Intravenous Infusion and Intravenous Bolus Administration in C-Section

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ABSTRACT

Objective: The purpose of this study is to assess the frequency of epigastric pain following intravenous infusion versus intravenous bolus administration of oxytocin in caesarean section.

Study Design: Case control/Prospective

Place and Duration: M. Islam Medical College, Gujranwala from 1st January 2018 to 30th June 2018.

Methods: A total of 100 patients were enrolled in this research. After obtaining written agreement, detailed demographic information such as the patient's age, BMI, and parity were collected. Those who took part in the study ranged in age from 18 to 45. Patients were separated into two equal groups, designated as I and II, respectively. Group I received an intravenous infusion, while group II received an intravenous bolus of medication. There was a significant difference in the frequency of epigastric pain between the groups. The SPSS 25.0 version was used to examine the entire set of data.

Results: In group I mean age was 26.11± 7.64 years and mean BMI was 25.12±3.19 kg/m^2 while in group II mean age was 27.07 ±4.37 years with mean BMI 25.01±4.55 kg/m^2. Mean diastolic blood pressure was 80.88± 3.55 and 81.34 ±7.78 among both groups. We found that most of the patients were multigravida in both groups 33 (66%) and 34 (68%) while frequency of primigravida in group I was 17 (34%) and in group II was 16 (32%).We found that prevalence of epigastric pain was observed higher 25 (50%) in bolus group II as compared to infusion 14 (28%) group I with p value < 0.05.

Conclusion: We found from this study that the frequency of epigastric discomfort was higher in the intravenous bolus group as compared to the infusion of an equivalent dose of oxytocin in the control group.

Keywords: Intravenous bolus, Intravenous infusion, Epigastric pain, Pregnancy, C-section

INTRODUCTION

Postpartum haemorrhage (PPH) prevention is a major concern because of the severe impact it has on maternal morbidity and death after childbirth. It is referred to as primary postpartum haemorrhage when blood loss surpasses 500 mL following a vaginal delivery or 1000 mL following a caesarean section within the first 24 hours after delivery. Every year in the United States, over 500.000 women die as a result of this potentially preventable cause of mortality. An estimated one-quarter of these deaths are thought to be the result of bleeding during pregnancy or childbirth in the past. [1] In addition to the need for additional therapies, severe anaemia and the need for blood transfusions are common complications of non-fatal PPH. Other problems include Sheehan's syndrome (pituitary infarction), coagulopathy, and organ damage as a result of hypotension and shock. Using International Classification of Diseases (ICD) codes that have been published in the National Perinatal Database (NPD) for the condition, PPH is diagnosed (ICD-9 and ICD-10). With the help of diagnostic codes from the ICD-9 and ICD-10 classification systems, pulmonary hypertension (PPH) associated with pregnancy has been subdivided into four subcategories. A number of abnormalities were discovered, including a retained placenta, uterine atony (which occurred within 24 hours of delivery), delayed and secondary PPH (which occurred beyond the first 24 hours following delivery), and coagulation deficiencies (which occurred after the first 24 hours after delivery) (2). It was discovered in a study conducted by the International PPH Collaborative Group that there was an increasing trend in coded PPH, not only in low-income countries but also in Canada, New South Wales, and the United States between 1991 and 2006, possibly as a result of increasing maternal age at childbirth, increasing rate of caesarean delivery, increasing rate of induction of labour, and increasing number of multiple pregnancies. It is standard practise in elective C-sections to provide oxytocin after placental delivery in order to aid in the establishment and maintenance of appropriate uterine contractility following the birth of the child. [2] During a vaginal birth, the hormone oxytocin is also regularly administered (VAD). In addition, the uterotonic effect of oxytocin is important in minimising blood loss from the site of placental attachment, which reduces the risk of postpartum haemorrhage after delivery. Tachycardia, hypotension, and changes in EKG are all known to occur after intravenous oxytocin delivery, and it is possible that these outcomes will occur (ECG). [3-5] Despite the fact that many practitioners use 5 units of oxytocin during elective CD[6,] there is limited data to support the practise of using this amount. Reduced incidence of adverse effects is associated with lower oxytocin dosages; however, only a few studies have looked into the dose-related effects of an oxytocin bolus in the setting of elective caesarean birth for the purpose of achieving appropriate uterine tone (UT) (ECD). [7,8]

Taking advantage of these findings, we devised a clinical "rule of threes" oxytocin algorithm, which incorporates oxytocin as well as other uterotonic medicines, for use during caesarean delivery.

In order to reduce the dose- and rate-related side effects of oxytocin, the algorithm was developed to incorporate doses that have been shown to produce adequate uterine tone in women with or without previous exposure to oxytocin[10,11] in a plasma half-life (3 to 12 min) context-sensitive manner[12]; additionally, in cases where oxytocin-induced uterine tone is found to be inadequate, the algorithm allows for the systematic timed inclusion of alternative uterot (i.e., methylergonovine, carboprost tromethamine).

Specifically, the goal of this study is to compare the frequency of epigastric pain following intravenous infusion versus intravenous bolus administration of oxytocin in caesarean section patients who receive either method..

MATERIAL AND METHODS

This prospective/case control study was conducted at M. Islam Medical College, Gujranwala from 1st January 2018 to 30th June 2018 and comprised of 100 patients. After obtaining written agreement, detailed demographic information such as the patient's

age, BMI, and parity were collected. This study did not include patients with diabetes, hypertension and pre-eclampsia.

In this study, patients were separated into two equal groups after being divided equally (n=50). A total of 18-45-year-old patients participated in this study. For Group I, five IU of oxytocin were infused over five minutes, and for Group II, one IU of oxytocin was infused over five minutes in dilute five mL of saline, administered as an instantaneous bolus for five seconds. Syringe pumps were used to dissolve the infusion, and 5 IU of oxytocin were dispersed in 15mL of normal saline. It was discovered that both groups suffered from epigastric pain on a regular basis. Complete data was analyzed by SPSS 25.0 version.

RESULTS

In group I mean age was 26.11± 7.64 years and mean BMI was 25.12±3.19 kg/m^2 while in group II mean age was 27.07 ±4.37 years with mean BMI 25.01±4.55 kg/m^2. Mean diastolic blood pressure was 80.88± 3.55 and 81.34 ±7.78 among both groups. We found that most of the patients were multigravida in both groups 33 (66%) and 34 (68%) while frequency of primigravida in group I was 17 (34%) and in group II was 16 (32%).(table1)

Table 1: Patients' extensive demographic information

Characteristics	I (50)	II (50)
mean age (years)	26.11± 7.64	27.07 ±4.37
Mean BMI (kg/m^2)	25.12 ±3.19	25.01±4.55
Mean diastolic pressure(mmhg)	80.88± 3.55	81.34 ±7.78
Parity		
Multigravida	33 (66%)	34 (68%)
Primigravida	17 (34%)	16 (32%)

We found that prevalence of epigastric pain was observed higher 25 (50%) in bolus group II as compared to infusion 14 (28%) group I with p value < 0.05. (table 2)

Table 2: Comparison of outcomes (epigastric pain) among both groups

Characteristics	I (50)	II (50)
Epigastric Pain		
Yes	25 (50%)	14 (28%)
No	25 (50%)	36 (72%)

p value < 0.05

DISCUSSION

The administration of oxytocin to labouring moms has been the subject of substantial research for more than three decades now. The dosing has steadily dropped from a high bolus dosage to a low bolus dosage as the dose has decreased. In elective caesarean sections, there has been a reluctance to standardise the lowest possible dose of anaesthetic. According to the Caesarean Sections Directive in the United Kingdom, oxytocin should be provided as a progressive intravenous bolus dose following caesarean section surgery. [13] The reason for this, according to some, is due to a lack of comparability in studies performed with oxytocin doses less than five units, along with an increase in reports of serious side effects associated with doses greater than five units, despite the fact that, as previously stated, there is no additional benefit in terms of uterine tone or a reduction in haemorrhage at these higher doses. Despite the fact that just a small amount of blood was lost, it was sufficient to modify the expected reduction in heart rate when modest doses of oxytocin were administered, resulting in an elevated heart rate and a drop in blood pressure instead of the expected decrease in heart rate. [14]

There were 100 participants in the current study, which included both primigravida and multigravida women. The ages of the patients ranged from 18 to 45 years. We came to the conclusion that the patients should be divided into two groups. In group I, the mean age was 26.11 7.64 years and the mean BMI was 25.12 3.19 kg/m2, whereas the mean age in group II was 27.07 4.37 years and the mean BMI was 25.01 4.55 kg/m2, respectively. The mean diastolic blood pressure in both groups was 80.88 3.55 and 81.34 7.78, respectively. We discovered that the majority of the patients in both groups were multigravida, with 33 (66 percent) and 34 (68 percent) being multigravida, respectively, while the frequency of primigravida in group I was 17 (34 percent) and in group II was 16 (32 percent) (32 percent). The findings of this study were comparable to those of the previous study. [15,16] Pregnancy causes an increased number of uterine oxytocin receptors to be activated, with this number reaching a high near the end of pregnancy. A lower dose of oxytocin can be equally effective and safe as a higher dose of the hormone in this situation since the term uterus is more responsive to oxytocin than the ovaries in this situation. [17] Under the direction of SA, the effects of oxytocin, as well as the doses and methods of administration, have all been researched at LSCS in the laboratory setting. [18] The optimal dose has been established to be IU/kg/day, as recommended by the Confidential Enquiry into Maternal Deaths (CEMD)16 and supported by Pinder et al. The recommended amount is IU/kg/day. [19] And in the case of LSCS patients, researchers Butwick et al. looked into the effectiveness of various oxytocin dosages in a clinical context. After conducting their research, they came to the conclusion that lower doses (0.5-3 IU) are just as beneficial as higher doses (5 IU) in terms of establishing a suitable uterine contraction. [20]

We discovered that the prevalence of epigastric pain was seen to be higher in bolus group II (50 percent) as compared to infusion group I (14 percent) in this study. Our findings are consistent with those of Thomas et al., who came to the conclusion that oxytocin bolus should be administered cautiously in patients with an unstable circulatory condition and that patients should be reassured about the uterotonic effects of oxytocin when injected over a five-minute period of time. [18] After an unsuccessful induction attempt, two and a half units of oxytocin can be delivered as a "loading dosage" to promote uterine tonicity before an oxytocin infusion for maintenance is started, according to the findings of a study on caesarean sections for failing induction attempts. When administering oxytocin, it is feasible to dilute it and provide it as a rapid infusion in order to minimise a precipitous drop in blood pressure. [15,16] The use of reduced bolus oxytocin doses of one and two units were found to be ineffective when uterine contraction was insufficient, whereas the use of three units was found to be effective in terms of adequate uterine contraction, reduced blood loss, a stable haemodynamic system, and the absence of adverse effects during elective caesarean section.

The development of new uterotonic medications and therapies for women at high risk for uterine atonement or postpartum haemorrhage is projected to be necessary in addition to the present options available. An intravenous Bolus of a same amount of oxytocin, according to the findings of our experiment, is associated with a decreased frequency of epigastric pain in elective LSCS patients.

CONCLUSION

We found from this study that the frequency of epigastric discomfort was higher in the intravenous bolus group as compared to the infusion of an equivalent dose of oxytocin in the control group.

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