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A COMPARATIVE STUDY OF TWO REGIMES OF OXYTOCIN USAGE DURING THE TIME OF ELECTIVE CESAREAN SECTION THROUGH SPINAL ANESTHESIA

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Abstract:

Objective: *The study focused on the comparison of hypotension frequency within oxytocin infusion in elective cesarean section versus intravenous stat bolus oxytocin under spinal anaesthesia.*

Methods: *The study held at Jinnah Hospital, Lahore from October 2017 to July 2018. Approvals were obtained from the ethical committee of the hospital. A total number of 160 participants fulfilling inclusion criteria were registered for participation in the research study. Informed consent was obtained from all patients and demographical data was noted. The patients were categorized into 2 groups as Group A and B. Group A was treated with bolus oxytocin and Group B was treated with oxytocin intravenous infusion. The collected data analysis and entry was made by using SPSS.*

Results: *The average age in Group A with bolus group was (28 ± 6.35) years and within Group B with oxytocin intravenous was (30 ± 7.24) years. The ASA type I and type II was completed among 81 cases and 79 cases respectively. A number of 41 patients (25.63%) were found with hypotension. A Statistically significant difference was observed among both study groups i.e. P-Value=0.045.*

Conclusion: *Group A with Bolus Oxytocin displayed significantly lesser hypotension occurrence as compared to Group B with oxytocin infusion within the elective cesarean section through spinal anaesthesia.*

Keywords: *Cesarean Section, Anesthesia, Spinal and Oxytocin.*

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INTRODUCTION:

The cesarean segment is commonly completed main operations within females in the whole world. In the past four decades, the frequency of these operations is observed between 20% and 30% within most advanced countries, up to 70% within some Latin American countries and 40% within China [1]. The Operative morbidity consists of haemorrhage, anaemia, hysterectomy, transfusion risks, and within serious cases, death of the mother. One of the causes of maternal mortality in the world is Obstetric haemorrhage and it is vastly related to uterine atony [2]. Oxytocin is one of the most usual drugs as the uterotonic agent is which is managed within a wide range of timing patterns and doses [3]. Though oxytocin is used as a preventive measure, it can illogically contribute to maternal mortality and morbidity peri-operatively. Reflex tachycardia, transient hypotension and a rise in cardiac output within a dose-related method are some of the known belongings of its usage as an intravenous bolus. Oxytocin management is significantly linked with neonatal maternal and fetal adverse proceedings [4]. Developing information about the potential damage of oxytocin in the period of childbirth has started a debate regarding suitable drug dosing. The present studies have proposed the optimal intravenous dose that equalizes risks of side effects along with the advantages of stopping the haemorrhage of after cesarean section as 3–5 IU after delivery of the child, by means of a single prophylactic dosage for all cases [5]. The lower oxytocin dosage is established in ongoing research as compared to those endorsed by many current guidelines [5, 7]. In a study presented by Butwick and colleagues in the year 2010 for determining the lowest operative bolus oxytocin dosage for producing appropriate uterine tone within the period of elective Caesarean delivery. The hypotension prevalence was significantly high with infusion oxytocin as in comparison with bolus oxytocin after one minute of delivery 47% versus 28%, $p<0.05$, $n=15$ in each group. While all patients showed sufficient uterine tone after ten minutes of delivery within both groups [5]. The study focused on the comparison of the frequency of hypotension with oxytocin infusion versus intravenous stat bolus oxytocin versus elective cesarean section with spinal anaesthesia. Research Literature has indicated that higher oxytocin dose can produce hypotension, but, the uterine tone was satisfactory within all patients whether oxytocin is given as in infusion or stat bolus. No local data is available regarding this. Emphasis is on the confirmation of the evidence and for obtaining local magnitudes. This way we will be able in the future to recommend lower dosage oxytocin as an alternative of high dosage for preventing patients from many hemodynamic complications and hypotension.

METHODS:

The study held at Jinnah Hospital, Lahore from October 2017 to July 2018. A total number of sample sizes of 160 cases within three groups (80 in each group) was intended with 80% test power, five percent level of significance with expected hypotension percentage i.e. 28% with bolus oxytocin and 47% with oxytocin infusion during elective cesarean section through spinal anaesthesia [5]. Data collection was made through Non-Probability consecutive Sampling, Female participant patients with age range 18 to 40 years, parity<4, presenting at term, gestational age>36 weeks on dating scan of antenatal record, for deliberate cesarean delivery through spinal anesthesia ASA class I/II were enrolled within the study while patients with known Gestational or chronic hypertension (BP≥140/90mmHg) and drug allergy to oxytocin (on history) were not included. Total of 160 patients satisfying inclusion criteria were registered for participation in the study. Well-versed consent was gotten from all patient and ethical clearance was obtained from the hospital committee. Demographic information including name, parity, age, gestational age, hospital registration number, and BMI was also noted. Patients were distributed among two groups through the lottery method. Within Group A was provided three units of stat bolus oxytocin and Group B was provided ten units/hour oxytocin infusion. I/V cannula 18G was passed within the pre-operative holding area, and ringer lactate was initiated I/V as 10ml per kg within all groups as preloading dosage. Pre-operative blood pressure was noted and spinal anaesthesia was done under L3 intervertebral space with the spinal needle (25G) in sitting position and at the baseline, the MAP was recorded. Before surgery researcher, himself prepared oxytocin dose diluted through 0.9% normal saline comprising 1 unit per ml. Oxytocin was managed as IV bolus for 15 seconds afterwards umbilical cord fastening. After skin closure MAP will be again observed and noted. If the MAP was ≥10% decreased from the baseline then Hypotension was labelled. Data was recorded on particularly designed Proforma and entry and analysis of the data were made through SPSS. Quantitative variables including age, BMI and gestational age were accessible in the form of S.D. and mean Qualitative variables like parity, hypotension, and ASA were existing within the form of frequency and percentage. To compare hypotension among Group A and Group B usage of Chi-square test was made and P-value ≤0.05 was considered as significant. Data was stratified for age, BMI ASA, and parity. The

poststratification, the chi-square test was utilized for comparing the hypotension among both groups.

RESULTS:

A total number of 160 cases were included within our research study. The average age of the patients of Group A (28 ± 6.40) years and its average value within Group B was (30 ± 7.25) years. The average value of Group A patients' gestational age was (40 ± 1.43) weeks and its average value within Group B was (40 ± 1.46) weeks. Out of 160 patients, twenty and fourteen patients within Group A and Group B respectively had no parity, a number of 26 and 25 patients among Group A and Group B respectively, had parity one, a number of 18 and 23 within both groups respectively, had parity two and the patients with parity three were 16 within A and 18 within B. The average BMI value of the patients within group A was (23.60 ± 3.40) kg/m^2 and its average value within group B was (24.30 ± 3.20) kg/m^2. Out of 160 patients the ASA type I was completed amongst 81 cases including 40 patients from Group A as well as 41 patients from Group B, in the same way, the ASA type II was assigned to 79 cases comprising 40 patients from A and 39 patients from B. The results of the research study indicated that the average value of MAP at the starting point of Group A patients was (86.30 ± 9.60) mmHg and its mean value within Group B was noted as (85.85 ± 8.85) mmHg. The difference was observed as statistically insignificant among the groups A and B with MAP at baseline of the patients. the p-value was noted 0.75 whereas the mean value of MAP after the delivery of group A patients was (76.40 ± 15.30) mmHg with mean value within group B (71.15 ± 16.45) mmHg. Among the groups A and B with MAP after delivery of the patients the difference was statistically significant. The p value= 0.038. In our study, the mean value of MAP percentage in Group A patients was (0.11 ± 0.15) mmHg and its mean value within group B was (0.17 ± 0.17) mmHg. Amongst the study groups, A and B with MAP percentage of the patients statistically significant difference was observed. The p value= 0.018. In this research study, the hypotension was seen in 41patients (25.63%) and it was not seen within 119 patients (74.38%). Amongst 41 cases of hypotension, 15 and 26 cases were from group A and group B respectively, in the same way, hypotension was not seen within 119 cases comprising over 65 cases from group A and 54 cases from Group B. The statistically significant difference was observed among the study groups with patient's hypotension, the P-Value= 0.045. As per the results of the patients of the age 30 years and below, the hypotension was observed in 36 cases comprising 15 cases from set A and 21 from set B, in the same way, participant patients with the age of more than 30 years, hypotension was observed within 5 cases and all belonged to group B. The difference was statistically significant among the study groups with hypotension in patients of 30 years and below. The p value= 0.034. Results of the study indicated that within patients having primary parity, the case of hypotension was observed within 29 cases comprising thirteen patients from set A and 16 patients from set B, In the same way multiparity patients the hypotension was seen within 12 cases comprising over 2 patients from group A and 10 patients from group B. The difference was observed as insignificant statistically among the study groups with hypotension stratification of parity. The p-value=0.215 and 0.055 respectively. In ASA type I patients, the hypotension was observed within 20 cases comprising over 6 patients from set A and 14 patients from set B, In the same way in ASA type II patients, the hypotension was seen within 21 cases comprising over 9 patients from set A and 12 patients from B. The difference was noted statistically significant amongst the study groups with hypotension in patients with type I ASA. The p-value 0.045. In the patients having normal BMI, the hypotension was noted within 23 cases comprising over 12 patients from set A and 11 patients from group B, In the same way in the BMI of overweight patients the hypotension was seen within 18 cases comprising over 3 patients from group A and 15 patients from Group B. statistically significant difference was observed among the study groups with hypotension within overweight BMI patients. The p-value=0.012 difference was seen amongst the study groups with hypotension within patients with type I ASA. The p value= 0.045. In patients having normal BMI, the hypotension was observed in 23 cases comprising over 12 patients from set A and 11 patients from set B, same was observed within patients with obese BMI, the hypotension was seen within 18 cases comprising over 3 patients from set A and 15 patients from set B. statistically significant difference was noted amongst the study groups having hypotension within overweight BMI patients. i. e p-value=0.012

Table – I: Variables Stratification (Oxytocin Bolus and Oxytocin Infusion)

Variables	Oxytocin Bolus (80)		Oxytocin Infusion (80)		P-Value
	Mean	±SD	Mean	±SD	
Age	27.96	6.35	29.44	7.24	0.59
Gestational age	39.84	1.43	40.04	1.46	0.67
Parity	1.38	1.07	1.56	1.03	0.61
BMI	23.6	3.38	24.34	3.15	0.76
MAP at baseline	86.26	9.56	85.8	8.84	0.77
MAP after delivery	76.35	15.33	71.1	16.44	1.00

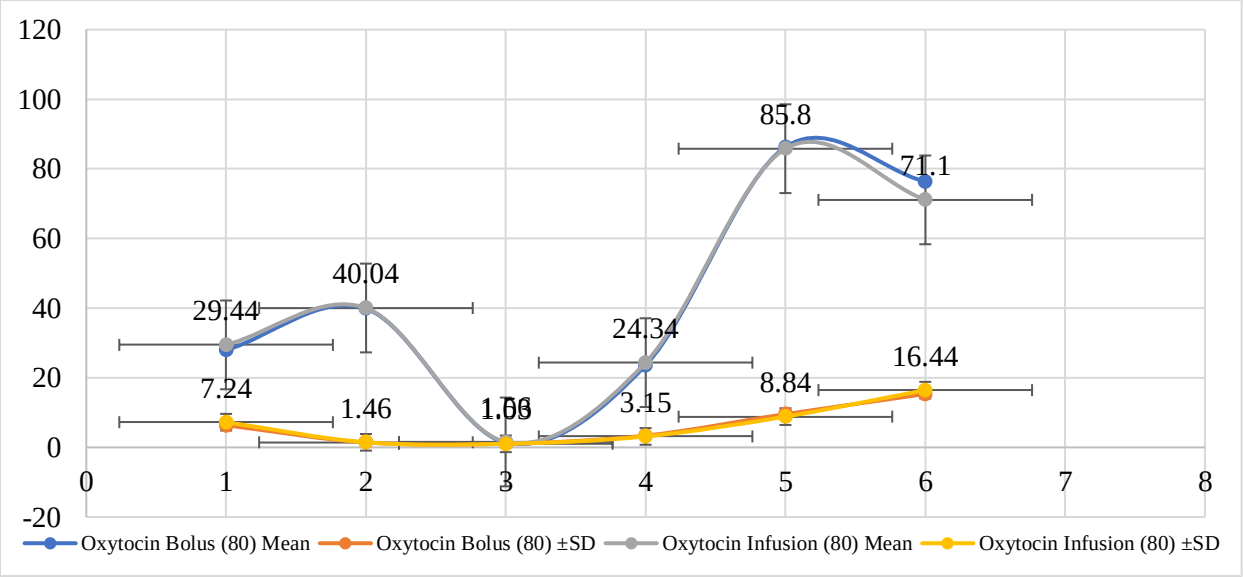
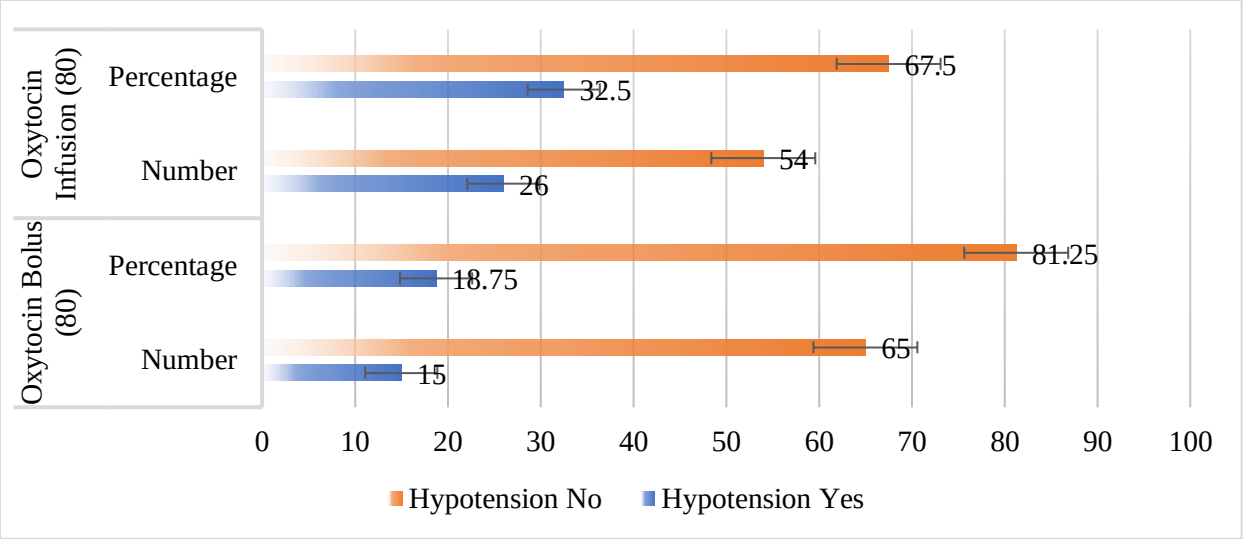


Table – II: Hypotension Status

Variables	Oxytocin Bolus (80)		Oxytocin Infusion (80)		P-Value
	Number	Percentage	Number	Percentage	
Hypotension Yes	15	18.75	26	32.5	0.46
Hypotension No	65	81.25	54	67.5	



DISCUSSION:

This study held for the comparison of the hypotension frequency with oxytocin infusion versus intravenous stat bolus oxytocin in elective cesarean section through spinal anaesthesia Uterine atony rises the risk of obstetric haemorrhage within pregnant women facing cesarean sections. Oxytocin is the backbone of uterine atony treatment. Prophylactic routine usage of oxytocin is observed reducing the postpartum haemorrhage incidence by up to 40%. The larger oxytocin dosage injected rapidly has produced many adverse effects like nausea, hypotension, vomiting, headache, chest pain, flushing, ST-T segment changes, myocardial ischemia, pulmonary edema, convulsion and severe water intoxication [8, 9] In this study, the hypotension was seen within 41 patients (25.63%) comprising 15 and 26 patients from set A and B respectively with significant statistically difference observed among the study sets of patients with patient's hypotension. i. e p-value=0.045. A study in the UK reported that 86% obstetricians and 92% anaesthetists commonly utilized the slow intravenous bolus of five-unit oxytocin during the cesarean section. Though, efficacy and safety data are deficient in supporting the usage of an oxytocin 5 units bolus as a care standard through the elective cesarean section [10]. A study presented by A. J. Butwick et al [5] indicated that the occurrence of hypotension was high after 0-unit vs 5 units oxytocin at 1 min as seven percent vs 47%; P=0.05. UT scores were expressively low within participant patients getting 0-unit oxytocin at two as well as three min in comparison to three and five units oxytocin, P less than 0.05, respectively. Many research studies have indicated that oxytocin bolus doses, more than five units are linked with hypotension. There were no significant differences within the occurrence of tachycardia or hypotension amongst the study groups getting 0.5–3 units [11, 13]. A significant decrease of MAP 30 seconds after the management of a 10 IU bolus oxytocin but a significant rise in HR and cardiac output, happened 1 minute after 5 IU management has been stated earlier [11]. One trial linked the usage of placebo infusion and oxytocin bolus along with oxytocin bolus as well as 30 IU oxytocin infusion. Data indicated falls within both, the usage of major obstetric haemorrhage and additional uterotonic agents [14]. In a study by Sarna and colleagues [15] studied the effects of various infusions of oxytocin as total dosage range =5 to 20 units, through elective cesarean section, and alterations were detected within the adequate UT occurrence among the higher- and lower-dosage oxytocin regimens. Additionally, a small experimental, examined the effects of oxytocin infusion and placebo bolus compared with an oxytocin infusion and oxytocin bolus and observed no alteration within the necessity for any additional uterotonic agent within the 1st day after cesarean section [16]. A study presented by Susmita Bhattacharya et al [17] stated that the oxytocin administration IV infusion within elective cesarean delivery is better than the similar dosage managed as a bolus IV dose for producing adequate uterine contraction and is linked with less adverse hemodynamic variations. Our study was limited to a relatively smaller sample size and it also was a single centered study. There is a need for Larger multi-centered randomized control trials for determining the regime for oxytocin usage during cesarean sections for minimizing the adverse effects of the drug.

CONCLUSION:

Group A with Bolus Oxytocin displayed significantly lesser hypotension occurrence as compared to Group

B with oxytocin infusion within the elective cesarean section through spinal anaesthesia.

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