

Frequency of Postpartum Hemorrhage following Oxytocin use during Labor

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ABSTRACT

Post-partum hemorrhage is one of the major causes of maternal morbidity and mortality worldwide. Efficient and timely management of 3rd stage of labor decreases the loss of blood and reduces the chances of hemorrhage. Prophylactic use of oxytocics plays a key role in the management of 3rd stage of labor. Use of oxytocin for augmentation of labor is itself a risk factor for post-partum hemorrhage. This study was designed to find frequency of postpartum hemorrhage following oxytocin use during labor.

Objective: To determine frequency of postpartum hemorrhage following oxytocin use during labor.

Methodology: It was a Descriptive case control study. Cases were those patients in whom postpartum hemorrhage observed after delivery. Controls were those patients in whom postpartum hemorrhage was not observed after delivery. In both cases and controls, it was observed whether oxytocin was used for augmentation of labor or not. In both groups, frequency of PPH was observed following oxytocin use during labor. Study was conducted in labor ward of Department of Obstetrics & Gynaecology, Sheikh Zayed Hospital, Rahim Yar Khan from 18th June 2018 to 17th December 2018.

Results: Mean age of the patients was 27.60±0.19 vs. 27.39±0.20 years respectively in Cases and Controls. Mean gestational age was 38.46±0.05 vs. 38.54±0.06 weeks in Cases and Controls respectively. Oxytocin use was observed in 130(53.28%) vs. 106(43.44%) among Cases and Controls respectively.

Conclusion: There is almost 1.5 times increased risk of having post-partum hemorrhage in patients having augmentation with oxytocin during labor.

Keywords: Post-partum hemorrhage, augmentation of labor, oxytocics, oxytocin, 3rd stage of labor

INTRODUCTION

Post-partum hemorrhage (PPH) is one of the most critical obstetrical emergencies after a vaginal delivery or cesarean section. It is one of the major causes of maternal morbidity and mortality among both high and low per capita income countries,¹ WHO quotes the prevalence of PPH to be 34% in Pakistan^{2,3} and is counted as one of the most prevalent causes of maternal mortality, accounting for 21% of all maternal deaths as determined from hospital based data⁴. The four basic processes known as 'the four T's (tone, trauma, tissue, thrombin) are described as the causes of post-partum hemorrhage.⁵

According to a study, the most common risk factors for post-partum hemorrhage include retained products of conception (placenta), progression failure during 2nd stage of labor, placenta accrete, uterine atony, vaginal/cervical tears, instrumental delivery, new born/fetus that is large for gestational age (LGA), hypertension, induction/augmentation of labor with oxytocin.^{6, 7, 8, 9}

Post-partum hemorrhage requires immediate solution of the bleeding source and some surgical intervention, rapid stabilization of the mother's health status followed by a multidisciplinary approach.¹⁰ The prevention and treatment of PPH are vital steps towards improving the healthcare of women during childbirth and achievement of MDGs.¹¹

Moreover, efficient management of 3rd stage of labor significantly decreases the maternal blood loss and thus reducing the chances of post-partum hemorrhage. Prophylactic use of oxytocics should be practiced routinely in the management of 3rd stage of labor in all the patients as they decrease the chances of post-partum hemorrhage by about 60%.⁴ 2nd and 3rd line interventional modalities should be considered if the initial measures fail to stop bleeding and uterus still remains atonic persists; which include some surgical and some mechanical maneuvers, i.e., intra-uterine balloon tamponade method or hemostatic brace sutures apart from hysterectomy to be kept as the last surgical option for an uncontrolled post-partum hemorrhage.¹²

Oxytocin used for augmentation of labor is itself a major risk factor for post-partum hemorrhage due to atonic uterus as it desensitizes the receptors and reduces post delivery effect of

oxytocin on uterine contractility. According to a case control study conducted in 106 French hospitals, oxytocin was administered for augmentation of labor to 73% of subjects in case group and to 61% of subjects in Control group (crude Odds Ratio: 1.7, 95% CI 1.5 to 2.0). Upon compensation for most of the critical confounders, oxytocin use for augmentation of labor was found in association with a significantly higher risk towards severe post-partum hemorrhage (adjusted Odds Ratio: 1.8, 95% CI 1.3 to 2.6). But among the patients who did not receive any prophylactic oxytocin dosage after delivery; and among the patients who received a prophylactic dosage of oxytocin after delivery, this association between oxytocin use and post-partum hemorrhage was found significant for the categories with higher exposure.¹³

As post-partum hemorrhage is one of the major causes of maternal morbidity and mortality worldwide including Pakistan and in most of the delivery suites, labor is conducted by trained staff, midwives and TBAs. As oxytocin is being widely used in all labor wards for augmentation of labor thus increasing the incidence of post-partum hemorrhage, there is the need of up-to-date guidelines regarding the evidence-based indications for its use and that minimum useful regimens should be emphasized to reduce the risk of post-partum hemorrhage.

METHODOLOGY

It was a descriptive type of case control study. Cases were those patients in whom postpartum hemorrhage was observed after delivery. Controls were those patients in whom postpartum hemorrhage was not observed after delivery. In both cases and controls, it was observed whether oxytocin was used for augmentation of labor or not. Oxytocin was used during labor when indicated for labor augmentation with established delay in 1st stage of labor (i.e. cervical dilatation of less than 2 cm in 4 hrs). Prior to commencing oxytocin, vaginal examination & review of fetal heart rate was done. Syntocinon (oxytocin) 10 units added to 500 ml 0.9% NaCl minimum possible dose of syntocinon was used & titrated against uterine contraction aiming for a maximum of four to five contractions every ten minutes. In both groups, frequency of PPH was observed following oxytocin use during labor. This study

was conducted in labor ward of Department of Obstetrics & Gynaecology, Sheikh Zayed Hospital, Rahim Yar Khan from 18th June 2018 to 17th December 2018.

Total sample size was be 488 (244 each group). Sampling was done through non probability consecutive sampling technique was used. Women aged 21-35 years having normal vaginal delivery, Term pregnancy (37–41 weeks assessed on USG) Singleton pregnancy, Parity; P1-P4, Women without having PPH after delivery served as control and women with PPH after delivery served were included. Women with pre-existing medical conditions like diabetes mellitus confirmed on screening (random blood sugar), hypertension, preeclampsia confirmed on measuring BP and proteinuria. previous uterine surgery multiple pregnancy (confirmed on USG), fetal death (confirmed on USG),

Polyhydromnios and Patient on anticoagulant therapy were excluded from the study.

RESULTS

Present study was conducted on 488 patients having normal vaginal delivery at term. After delivery, patients having post-partum hemorrhage were taken as cases and those having no post-partum hemorrhage were taken as controls. Mean age for the patients came out to be 27.60±0.19 years vs. 27.39±0.20 years, respectively, among cases and controls while mean gestational age was 38.46±0.05 weeks vs. 38.54±0.06 weeks among cases and controls, respectively.

Table 01: Showing incidence of post-partum hemorrhage in case and control groups in comparison to different factors affecting them.

Factor	Classification	Case Group		Total	Control Group		Total	p-value
		A	B		A	B		
Age	21-25 Years	28	28	56 (22.95%)	37	31	68 (27.87%)	0.624
	26-30 Years	80	58	138 (56.56%)	46	82	128 (52.46%)	0.0003
	31-35 Years	22	28	50 (20.49%)	23	25	48 (19.67%)	0.698
	Total	130 (53.28%)	114 (46.72%)	244 (100%)	106 (43.44%)	138 (56.56%)	244 (100%)	
Parity/ Gravidity	Nulliparous	5	2	7 (2.87%)	4	10	14 (5.74%)	0.158
	Primigravida	30	29	59 (24.18%)	34	44	78 (31.97%)	0.399
	Para 1-2	62	52	114 (46.72%)	47	48	95 (38.93%)	0.479
	Para 3-4	33	31	64 (26.23%)	21	36	57 (23.36%)	0.104
	Total	130 (53.28%)	114 (46.72%)	244 (100%)	106 (43.44%)	138 (56.56%)	244 (100%)	
Gestational Age	37-38 Weeks	68	60	128 (52.46%)	43	75	118 (48.36%)	0.008
	39-41 Weeks	62	54	116 (47.54%)	63	63	126 (51.64%)	0.0590
	Total	130 (53.28%)	114 (46.72%)	244 (100%)	106 (43.44%)	138 (56.56%)	244 (100%)	

(‘A’ subgroup represents the study subjects who got oxytocin infusion while ‘B’ subgroup represents the study subjects who did not get oxytocin infusion for induction of labor)

Odds ratio was calculated to be 1.4846 which depicted that there is almost 1.5 times increased risk of having post-partum hemorrhage in patients having augmentation with oxytocin infusion during labor.

DISCUSSION

Post-partum hemorrhage is one of the leading causes of maternal morbidity and mortality worldwide. A study conducted in Pakistan revealed prevalence of post-partum hemorrhage as 34%.⁸

In order to decrease the prevalence of post-partum hemorrhage, a number of preventive measures must be taken. Efficient and timely management of 3rd stage of labor is one of them.¹⁴ Use of uterotonics, preferably oxytocin, is an important step in the better management of 3rd stage of labor which is used to induce or augment labor. Use of oxytocin infusion to induce labor has become a widely practiced procedure in worldwide which imposes a great concern towards the health status of the laboring women. This routine use of oxytocin is imposing a great concern because its use is not being decided on the basis of some well define indications or any evidence based studies rather its use has become a very common practice; without calculating the risk of post-partum hemorrhage.^{15,16}

There are different studies which conclude at opposite results on the use of oxytocin during labor to be adding a risk towards post-partum hemorrhage or having no impact on it. This can be explained due to methodology bias where the oxytocin is not being used on the basis of proper indications for its use or the correct amount of oxytocin being used is not evidence based apart from the impact of prophylactic use of oxytocin after birth.

This study was designed to compare the frequency of post-partum hemorrhage in patients following the use of oxytocin infusion to induce/augment labor. The mean age of the patients was 27.60±0.19 vs. 27.39±0.20 years respectively in Case group and Control group. Mean gestational age was 38.46±0.05 vs. 38.54±0.06 weeks in group Case group and Control group, respectively. In 130(53.28%) vs. 106(43.44%) Cases and Controls, respectively, oxytocin was used to induce labor. Odds ratio was 1.4846. These results are comparable to ones found in the international literature.

Sheiner et al conducted a study over 153,000 patients in labor in a population which resulted in a significant impact of oxytocin usage for augmentation of labor leading towards post-partum hemorrhage (adjusted Odds Ratio: 1.4).⁶

Chad A Grotegut and Associates,¹⁷ in a case-control study, stated that the routine use of oxytocin to induce labor has been observed posing a significant risk towards post-partum hemorrhage due to uterine atony. They found that the patients who went through severe post-partum hemorrhage due to uterine atony had experienced a significantly excessive use of oxytocin among case groups and control groups (10,054 mU vs. 3762 mU, p<0.001) with Odds Ratio: 1.47 [95% CI: 1.17, 1.93].

Azar Mehrabadi and Associates¹⁸ conducted a study on British-Columbian population from 2000-2009; temporal trends in

atonic postpartum hemorrhage revealed that Oxytocin use caused 7.2% atonic PPH ($p < 0.001$).

Oxytocin augmentation caused the risk of severe postpartum hemorrhage revealing Odds Ratio: 1.35 [95% CI: 1.10–1.65] ($p < 0.001$).¹⁹

Imane Khireddine et al²⁰ evaluated the effect of oxytocin and prostaglandin used for labor induction in low risk women. Adjusting the bias factors, they found that post-partum hemorrhage was more common among the patients who went through labor augmentation with the help of oxytocin in contrast to the ones who had spontaneous labor (Odds Ratio: 1.22, 95% CI 1.04–1.42).

In context of methods to induce labor, Malabarey and Colleagues²² found that the induction with oxytocin was found causing post-partum hemorrhage more commonly than the induction with prostaglandins in low risk population.

Waterstone et al²¹ in two different studies reported similar Odds Ratios, concluding chances of post-partum hemorrhage to be 1.6 times higher among women who get oxytocin infusion during labor.

Belghiti J et al¹³ conducted a case control study in order to evaluate the incidence of severe post-partum hemorrhage in regards to prophylactic use of oxytocin after birth and they found the crude Odds Ratio to be 2.3 (95% CI: 1.8–3.0) in patients who did not get prophylactic dose of oxytocin after birth vs 1.6 (95% CI 1.3–1.9) in patients who did.

Al-Zirqi I and Associates²³ found in their study that risk of post-partum hemorrhage was significantly higher among the groups of induced labor vs the groups with spontaneous labor (Odds Ratio: 1.71; 95% CI, 1.56–1.88).

Maliha Sadaf and Colleagues²⁴ revealed that intravenous oxytocin infusion for augmentation of labor caused postpartum hemorrhage in 2.40% patients.

There are some other studies which do not support this positive association between the use of oxytocin for induction of labor and the post-partum hemorrhage. For example, a study based on multiple healthcare centers in Latin America comprising of 11,323 study subjects with the use of oxytocin for induction of labor, showed that only 211 patients went through severe postpartum hemorrhage thus concluding a non-significant link between oxytocin usage and post-partum hemorrhage. This study was conducted by Sosa et al.²⁵

CONCLUSION

In present study, it was observed that, significantly, use of oxytocin was more evident in Cases using oxytocin for augmentation ($p = 0.029$). Odds ratio (1.4846) depicted that there is almost 1.5 times risk of having post-partum hemorrhage in patients having augmentation with oxytocin during labor.

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