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Controlling Post-Partum Hemorrhage Using A Novel Technique of Multiple Sponge-Holding-Forceps Applied Along Cervical Canal

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ABSTRACT

Introduction: Postpartum hemorrhage (PPH) is not only one of the leading causes of maternal mortality but also the most feared complication amongst obstetricians. Despite various predictive factors, PPH can occur in low risk pregnancies without predictive factors. Application of sponge holding forceps vaginally can invariably stop bleeding, leading to prevention of serious consequences.
Aims & Objectives: To determine the proportion of success of PPH control using sponge holders applied vaginally to the cervix after failure of medical treatment and before going for hysterectomy, in immediate post partum period.
Place and duration of study: This study was a cross-sectional study conducted at the labour room, Indus Hospital Raiwind for duration of one year from June 2020 to June 2021.
Material & Methods: Clinical and demographic features were recorded on a pre-designed proforma. Parity and gravidity was determined. Amount of bleeding was estimated and recorded. Additionally, the final result of patients was reported, as well as if they required surgical intervention. Data was analyzed using SPSS 24.p value ≤0.05 was considered significant.
Results: The mean (SD) age in our study was 26.28 (4.11) years. In this study majority of the patients were primipara 65% (n=26) and 35% (n=14) were multipara. On the basis of gravidity, more patients 37.5% (n=15) were primigravida while multigravida and grand multigravida patients were 27.5% (n=11) and 35% (n=14) respectively. The mean (SD) blood loss before the procedure was 720 (200) ml while after the procedure it was 90 (130) ml (p=0.02). This procedure was successful in all the patients and there was no need of further surgical intervention.
Conclusion: Our study concludes that use of sponge holding forceps as cervical clamp around cervix is one of the effective, economic and safe procedure for PPH patients.

Key words: Cervix; Efficacy; Postpartum hemorrhage; Sponge holding forceps

INTRODUCTION

Postpartum hemorrhage (PPH) is not only one of the leading causes of maternal mortality but also the most feared complication amongst obstetricians. Despite various predictive factors, PPH can occur in low risk pregnancies due to unknown etiology. Application of sponge holding forceps vaginally can invariably stop bleeding, leading to prevention of serious consequences.

Postpartum hemorrhage is defined as blood loss of more than 500ml after normal vaginal delivery or 1000ml after c-section. Postpartum hemorrhage results in 25% of maternal deaths occurring each year. PPH results in maternal deaths of about 1 per 1000 deliveries in low resource countries and 1 in 100,000 deliveries in developed countries.[1,2] The preponderance of these fatalities 88 % occur within four hours after birth, suggesting that they are the result of third-stage labour events. Too little, too late is a frequent motif in PPH. Due to the episodic character of PPH and the fact that it is virtually always unexpected, birth attendants are unprepared to cope with it on a routine and repeated basis. About 14 million women around the world go into PPH every year with approximately 26 women every minute. The prevalence of PPH in Pakistan is 1.6%.[3] All pregnancies are at risk of PPH even if no predisposing factor is found. Most of the maternal deaths occur within first few hours of delivery. The major problems encountered in developing countries is late diagnosis of PPH, limited availability of pharmacological agents, absence of skilled staff to manage PPH, and availability of blood required to manage patients in case of failure of medical treatment.[4]

The most common cause of primary PPH is uterine atony, others include genital trauma, retained

placenta or adherent placenta, uterine rupture, maternal bleeding disorder.[5,6]

The active management of third stage of labour is practiced widely to control bleeding. It includes giving prophylactic uterotonics before delivery of baby, early cord clamping and controlled cord traction.[5] Now transamine has also being recently added as active management of third stage of labour.[7-11] PPH has historically been the largest cause of global maternal death, accounting for over 34% of the 275,000 maternal fatalities globally in 2015 and as high as 17.62 % of Chinese maternal fatalities in 2018, according to China's 2018 National Maternal and Child Health Annual Report.[12,13] The World Health Organization's (WHO) most recent prescription for preventing PPH is 10IU of oxytocin for all deliveries, and uterotonics such as carbetocin, ergometrine, and misoprostol may aid in successful uterine contraction[14] But, desensitization to oxytocin could diminish efficacy, and uterotonics has medication contraindications and adverse effects such as water intoxication, nausea, vomiting, and elevated blood pressure.[15] Additionally, in limited resources countries, the absence of uterotonics, blood products, or interventional treatment may significantly raise the likelihood of maternal mortality.[12] After these measures if still bleeding is not controlled, and any treatable cause is ruled out then next step is use of different types of tamponades to control bleeding. Though these tapenades are found effective in 90 percent of cases.[16] In case of failure surgical measures are resorted to promptly as substantial blood loss has already been endured.[17] As many deaths related to PPH occur in low resource areas and by unskilled staff, some quick and easy methods have to be introduced to save the lives of many.

Objective of this study was to describe a simple and effective technique for avoiding excessive blood loss in PPH in those patients where medical therapy has failed. This method provides different advantages such as it can be used safely in any setting with or without facility, can be used to prevent as well as treat hemorrhage, very cheap, easily accessible, easy to use, can save from surgical intervention and preserve fertility and most importantly it can be used as temporary measure to shift the patient from periphery to nearby hospital.

Therefore this study was carried out to determine the proportion of success of PPH control using sponge holders around the cervix after failure of medical treatment (Oxytocin, methylergonovine, Misoprostol (Cytotec),† a prostaglandin E_1 analogue[18] and before going for hysterectomy, in immediate post partum period at the Indus Hospital Raiwind.

MATERIAL AND METHODS

This study was a cross-sectional study conducted at the labour room, Indus Hospital Raiwind. The duration for this study was one year from June 2020 to June 2021. All patients of postpartum hemorrhage who were given medical treatment (Oxytocin, methylergonovine, Misoprostol (Cytotec),† a prostaglandin E_1 analogue[18] but not responding to medical treatment and are hemodynamically stable were selected. A consent form was signed from all the included patients for para-cervical clamps. The inclusion criteria for our study was patients with failed medical treatment for postpartum hemorrhage that were vitally stable, atonic uterus or patients referred from peripheries with heavy bleeding, women who want to preserve reproductive potential, women giving informed written consent for all surgical intervention including paracervical clamp, postpartum obstetrical hysterectomy while the criteria for exclusion was patients who were rapidly deteriorating vitally or in a stage of progressive/refractory shock, suspected uterine rupture, confirmed perineal tears, Placenta accreta percreta picked before or during surgery.[19] Patients routinely undergo cervical clamping as a desperate measure before hysterectomy in case of continuous vaginal bleeding. All patients suffering from PPH were identified in the labour room or coming in emergency room by obstetric residents. Data from such patients was recorded after informed consent. Clinical and demographic features were recorded on a pre-designed performa. Medications given during the management were recorded and, time of application of clamps and time of removal was noted. Amount of bleeding was estimated and recorded. PPH calculated by “a pictorial reference guide to aid visual estimation of blood loss at obstetric haemorrhage”.[20] Additionally, the final result of patients was reported, as well as if they required surgical intervention. Any woman who has given birth two or more times is referred to be "multipara." A grand multipara is a woman who has given birth five or more times.[21] This novel methodology includes the use of two speculums applied vaginally and 4 sponge forceps applied to cervix. The principle for this procedure is temporary occlusion of uterine arteries and its branches which represent the source of 90% of blood flowing to the uterus. The main procedure for this technique is as follow:[22]

1. Patient is placed in lithotomy position
2. Cervix is explored and any cervical tear identified if bleeding stitched
3. Anterior and posterior lip of cervix is grasped with help of sponge forceps

4. To occlude the right uterine artery, the cervix is pulled to the left, and a sponge forceps/paracervical clamp is applied to tissue within the lateral fornix as high and close to uterus as possible in the hopes of occluding the uterine artery within the tissue bundles, while avoiding the ureter.
5. Forceps/clamps to be locked only by one lock
6. The procedure is repeated on opposite side
7. 2-4 sponge holding forceps can be used according to need. If bleeding stops with the two sponge holders applied laterally then Sponge holding forceps applied to anterior and posterior lip of cervix is removed, otherwise can be kept in place.
8. The amount of bleeding decreases. The patient is constantly monitored. If the patient's hemodynamic status deteriorates or if bleeding persists, the patient is transferred to the operating room for additional treatment.
9. The vagina is packed with a roll guaze such that the forceps stay in place and away from vaginal wall to prevent any injury to vaginal mucosa. Forceps are kept for 6-8 hours and then removed.
10. With these clamps in place the blood flow to uterus through uterine arteries will be stopped.
11. Vaginal tears sutured at the end.

Statistical analysis:

Data was analyzed using SPSS 24. Continuous variables like age, were reported as Mean (SD). Categorical variables like parity, gravidity success of clamps was represented as frequencies and percentages. Associated factors of success of clamp such as duration of bleeding before and after clamping was done by using chi-square tests. P-value of <0.05 was considered significant.

RESULTS

This study was conducted at the labour room, Indus Hospital Raiwind for duration of one year from June 2020 to June 2021. A total of 40 patients were included in this study.

In the age wise distribution, majority of the patients 45% (n=18) were in age group of 21-30 followed by age group ≤20 25% (n=10), age group 31-40 20% (n=8) and age group ≥41 10% (n=4) (Fig-1). The mean (SD) age in our study was 26.28 (4.11) years. According to the gestational age majority 72.5% (n=29) of the patients have gestational age of ≥38 while 27.5% (n=11) patients have gestational age of ≤37 (Table-1). In this study majority of the patients 65% (n=26) were primipara and 35% (n=14) were multipara. (Table-2) On the basis of gravidity, more patients 37.5% (n=15) were primigravida while multigravida and grand multigravida patients were 27.5% (n=11) and 35% (n=14) respectively (Table-3). In our study majority of the mode of delivery 90% (n=36) were spontaneous vaginal deliveries while the lower segment Caesarean section cases were 10% (n=4). Two were primigravida and lower segment Caesarean section was done due to fetal distress while two were multigravida and lower segment Caesarean section was done due to previous Caesarean section (Fig-2) Majority of the labours 55% (n=22) in our study were spontaneous. The cases of induced labour were 40% (n=16) while 5% (n=2) labour were elective (Fig-3). This procedure shows efficient haemostatic effect. The mean (SD) blood loss before the procedure was 720 (200) ml while after the procedure it was 90 (130) ml. This was significant statistically (p=0.02) (Table-4). In our study blood transfusion was needed in 25% (n=14) patients while it was not needed in 75% (n=26) patients. (Fig-4) This procedure was successful in all the patients and there was no need of further surgical intervention due to careful selection of patients.

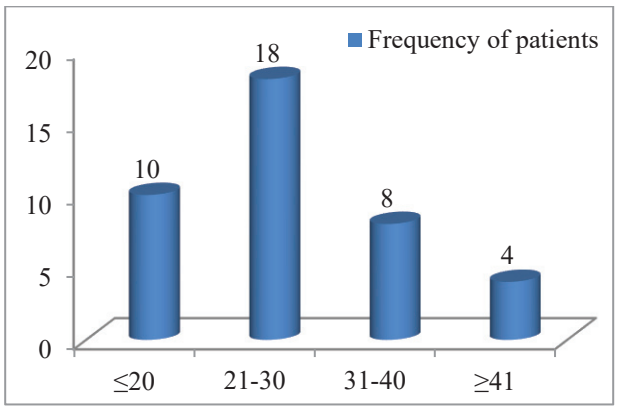

Fig-1: Age wise distribution of patients

Gestational age	Frequency	Percentage
≤37	11	27.5%
≥38	29	72.5%

Table-1: Distribution of patients on the basis of gestational age

Parity	No of patients	Percentage
primipara	26	65%
multipara	14	35%

Table-2: Distribution of patients on the basis of Parity

Gravidity	No of patients	Percentage
Primigravidity	15	37.5%
Multigravidity	11	27.5%
Grand multigravidity	14	35%

Table-3: Distribution of patients on the basis of Gravidity

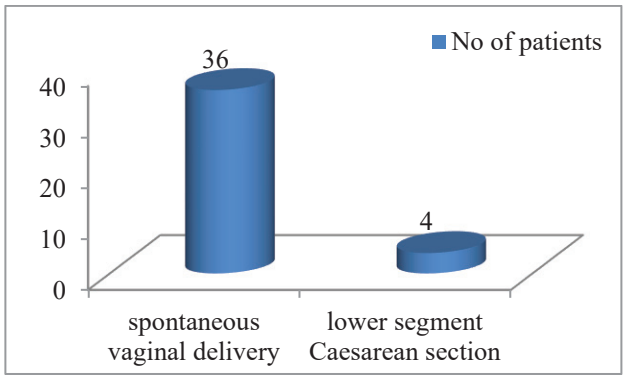

Fig-2: Distribution of patients on the basis of mode of delivery

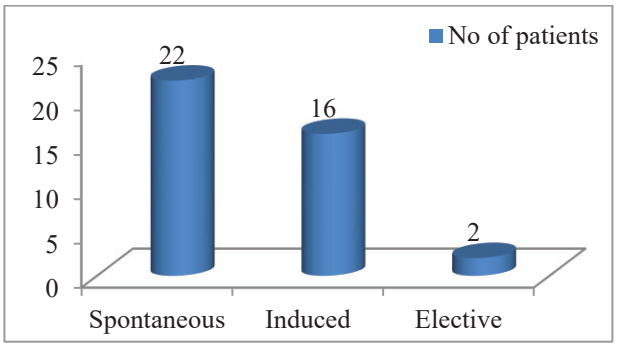

Fig-3: Distribution of patients on the basis of Labour

Blood loss	Mean (SD)	p
Before procedure	720(200) ml	0.02
After procedure	90(130) ml	

Table-4: Mean blood loss before and after procedure of clamping

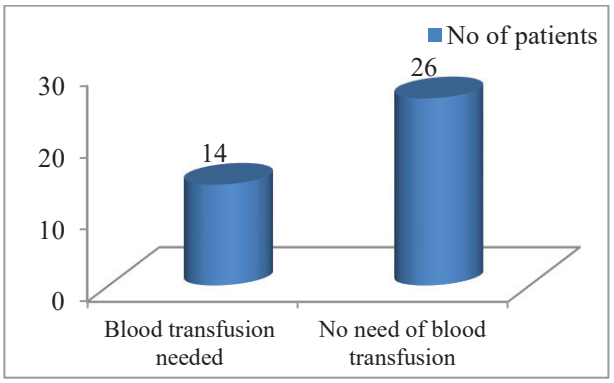

Fig-4: Distribution of patients on the basis of need for blood transfusion

DISCUSSION

Postpartum haemorrhage (PPH) is the major cause of maternal death globally, with a prevalence of 6%.[23] PPH is responsible for more than 30% of all maternal fatalities in Africa and Asia.[24] PPH is thought to raise the risk of morbidity by 50 times and has a 5 times greater disease rate than death rate. It has been suggested that early treatment of PPH is critical.[25] Despite the fact that the majority of patients may be managed with medicine like prostaglandins, oxytocin, and uterine massage while in around 10% of women with PPH need substantial surgical operations, including hysterectomy, which has the unfortunate side effect of preventing future fertility. Before turning to the final remedy for PPH, hysterectomy, it is crucial to have conservative management strategies in place when medical therapy fails.

At this stage in the care of PPH, a range of conservative treatments have been developed and used, including the use of sponge forceps as a cervical clamp. The use of sponge forceps as cervical clamps are a new, effective, easy, and minimally invasive surgical procedure for preventing excessive blood loss in postpartum hemorrhage in individuals who have failed to respond to medicinal therapy.[26] It allows for early intervention, preventing hysterectomy and consumption coagulopathy, as well as the preservation of reproductive potential. It may be employed in any situation, whether it has or does not have a facility. It serves as both a preventative and a therapeutic measure. It is affordable, convenient, and simple to use. Both traumatic and atonic PPH may be treated. It might be used as a transient treatment to move the patient to the peripheral for further therapy.

The present study was conducted at the labour room, Indus Hospital Raiwind for duration of one year from June 2020 to June 2021. A total of 40 patients were included in this study.

In this study, the mean (SD) age was 26.28 (4.11) years. These findings were in line with the Shekavat et al. and Gungorduck et al. who reported that the mean age in their study was about 26 years while our study mean age was lower that mean age reported by Gai et al. and Movafegh et al. who observed the mean age as 29.71±4.18 years and (27.0±3.4 years) respectively.[7-10] In the age wise distribution, majority of the patients 45% (n=18) were in age group of 21-30 followed by age group ≤20 25% (n=10), age group 31-40 20% (n=8) and age group ≥41 10% (n=4). Similar results were shown by a previous study done by Al-Zirqi et al. who reported that the majority of the patients were from 20-30 age group.[27] According

to the gestational age majority 72.5% (n=29) of the patients have gestational age of ≥38 while 27.5% (n=11) patients have gestational age of ≤37. A previous study done by Munir SI et al. shows similar findings to our study and reported that the gestation of the majority of the patients was between 37-40 weeks.[28] Santhanam R et al. also reported a similar finding, stating that 93.44 % patients were in gestational age >37 weeks.[29] In this study majority of the patients 65% (n=26) were primipara and 35% (n=14) were multipara. These results were similar to the findings reported by Al-Zirqi et al.[27] Another earlier study done by Bhavana et al. at also reported consistent results with our study.[5] On the basis of gravidity, more patients 37.5% (n=15) were primigravida while multigravida and grand multigravida patients were 27.5% (n=11) and 35% (n=14) respectively. In our study majority of the mode of delivery 90% (n=36) were spontaneous vaginal deliveries while the lower segment Caesarean section cases were 10% (n=4). Although LSCS is a stronger risk factor for PPH, but in our study vaginal birth has a higher rate of PPH patients. This might be because a bigger proportion of women accepted to the institution delivered vaginally, increasing the absolute number. Gupta et al. did a comparable research and observed a similar result by reporting that the majority of cases, 19 out of 25 76 % were normal vaginal delivery, while 6 (%) were delivered through caesarean section.[30] This procedure shows efficient haemostatic effect. The mean (SD) blood loss before the procedure was 720(200) ml while after the procedure it was 90 (130) ml. (p=0.02). In our study blood transfusion was needed in 35% (n=14) patients while it was not needed in 75% (n=26) patients. This procedure was successful in all the patients and there was no need of further surgical intervention. These findings were comparable to another study who reported that bleeding can be effectively controlled by this in PPH patients without further surgical intervention.[31]

The strength of our study was that inclusion and exclusion criteria were followed strictly while the limitation of our study is small sample size and lack of long term follow up. Our study suggests conducting a randomized control trial with large sample size and long follow up to determine the efficacy of this novel procedure in more effective way.

CONCLUSION

Postpartum hemorrhage (PPH) is a significant factor of maternal death and serves morbidity in the shape of fertility loss in future, particularly in impoverished countries like Pakistan. This mortality associated with PPH and devastating morbidity of fertility loss may be reduced when appropriate conservative treatments are used before invasive surgery such as hysterectomy. Our study concludes that use of sponge holding forceps as cervical clamp around cervix is one of the effective, economic and safe procedure for PPH patients. This procedure is more effective in low ncome countries. Our study shows that there was no need of surgical intervention in all the patients therefore our study also concludes that the need of surgical intervention in PPH can be reduced by using this technique. Our study suggests conducting a randomized control trial with large sample size and long follow up to determine the efficacy of this novel procedure in more effective way.

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