

Comparison of efficacy of balloon inflation and uterovaginal packing for control of primary postpartum hemorrhage after vaginal delivery

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Objective: To compare the effectiveness of balloon inflation and uterovaginal packing after vaginal delivery in controlling primary postpartum hemorrhage

Methodology: This randomized controlled trial was done in the department of Obstetrics and Gynecology, Bahawal Victoria Hospital, Bahawalpur from November 2019 to May 2020. It included 104 patients with postpartum hemorrhage with age 18 to 40 years. Patients with cesarean section, abnormal blood coagulation profile and twin pregnancy were excluded. They were randomly divided into group A (balloon

inflation) and group B (uterovaginal packing). Efficacy in controlling bleeding was recorded.

Results: Mean age of women in group A was 27.69 ± 3.68 and in group B 27.60 ± 3.64 years. Efficacy in control of hemorrhage was seen in 46 (88.46%) patients in Group A while in Group B, it was in 34 (65.38%) patients ($p=0.005$).

Conclusion: Balloon inflation technique for control of primary postpartum hemorrhage was better as compared to uterovaginal packing technique. (Rawal Med J 202;46:877-879).

Keywords: Balloon inflation, postpartum hemorrhage, vaginal packing.

INTRODUCTION

Postpartum hemorrhage (PPH) is one of the top five causes of maternal death.¹ Loss up to 1000 ml is well tolerated by a healthy pregnant woman partly due to physiological increase in the plasma volume and red cell mass during pregnancy. Nevertheless, hypovolemic shock is the major cause of maternal mortality.² Effective management requires teamwork, coordination, speed and proper facilities like blood and blood products and laboratory support.³

Most common cause is atony of uterus. Hemorrhage can occur despite active management of the 3rd stage of labor. Management of intractable postpartum hemorrhage, refractory to oxytocin and prostaglandins requires prompt action.⁴ In Pakistan, according to hospital data, between 25,000 and 30,000 women die each year from complications of pregnancy, childbirth and PPH.⁵ Loss of 500 ml of blood in the first 24 hours after birth is generally considered to be physiologically normal.⁶ In general, significant clinical deterioration only occurs when blood loss is >1000 -1500 ml.⁷

Success rate of balloon inflation technology to treat PPH has been reported to be 90%.⁸ In our routine, we

usually achieve it by uterovaginal packing i.e. roller gauze as bakery balloons are not available in Pakistan. Use of condom as balloon tamponade is a new technique which is said to serve the purpose more effectively, speedily and in an aseptic manner.⁹ In this study, we have compared the efficacy of uterovaginal packing and balloon inflation for the management of PPH.

METHODOLOGY

This randomized controlled trial was done in the department of Obstetrics and Gynecology, Bahawal Victoria Hospital, Bahawalpur from November 2019 to May 2020. A total of 104 cases of PPH were with age 18 to 40 years were included. All patients with PPH after vaginal delivery, both primipara and multipara were included while patients with cesarean section, bleeding disorders (on history) and patients with twin pregnancy (on ultrasound) were excluded. The study was approved by institutions ethics committee and an Informed written consent was obtained from attendants of all patients.

Socioeconomic status, place of residence, and demographic characteristics of all patients are recorded. They were randomly divided into group A

(balloon inflation) and group B (uterovaginal packing). Efficacy (PPH control) was regarded as an outcome variable. Non-probability, consecutive sampling was used. In group A, balloon inflation was performed, and in group B, uterovaginal packing was performed. The control of major PPH at 24 hours was checked and the efficacy was evaluated (yes/no).

Statistical Analysis: We used SPSS version-17. Parity, booking status (booked/un-booked), area of residence (rural/urban) and efficacy (yes/no) was recorded. Chi square was used to compare the efficacy of both groups. $p \leq 0.05$ was considered as significant.

RESULTS

The age range of this study was 18 to 40 years old, with an average age of 27.64 ± 3.66 years. (Table 1). Most women were multipara (Table 2).

Table 1. Age distribution for both groups (n=104).

Age (years)	Group A (n=52)		Group B (n=52)		Total (n=104)	
	Number	%	Number	%	Number	%
18-30	41	78.85	40	76.92	81	77.88
31-40	11	21.15	12	23.08	23	22.12
Mean \pm SD	27.69 ± 3.68		27.60 ± 3.64		27.64 ± 3.66	

Table 2. Parity in both groups (n=104).

Parity	Group A (n=52)		Group B (n=52)		Total (n=104)	
	Number	%	Number	%	Number	%
Primipara	12	23.08	11	21.15	23	22.12
Multipara	40	76.91	41	78.85	81	77.88

Table 3. Comparison of Efficacy between groups (n=104).

	Group A (n=52)		Group B (n=52)	
	Number	%	Number	%
Yes	46	88.46	34	65.38
No	06	11.54	18	34.62

Table 4. Stratification of efficacy with respect to age groups.

Age (years)	Group A (n=52)		Group B (n=52)		p-value
	Efficacy		Efficacy		
	Yes	No	Yes	No	
18-30	37 (90.24%)	04 (9.76%)	25 (62.50%)	15 (37.50%)	0.003
31-40	09 (81.82%)	02 (18.18%)	09 (75.0%)	03 (25.0%)	0.692

Table 3 shows that 46 (88.46%) patients in group A had effective rate (control of primary PPH), and 34 (65.38%) in group B. Table 4 shows the distribution of efficacy according to age among both groups.

DISCUSSION

First-line treatment options for PPH include conservative management with uterotonic drugs (oxytocin or prostaglandins). Today, hysterectomy is the most common method to manage severe uncontrollable PPH.¹⁰ Postpartum hysterectomy is associated with short-term and long-term complications (such as blood loss, bladder, bowel, ureter damage, impaired wound healing, infection and decreased fertility).

Recently, various techniques have been tried to avoid hysterectomy when uterotonic drugs cannot control massive PPH. These include uterine compression, external pressure using uterine sutures, and selective devascularization by ligating or embolizing uterine arteries. In a study by Nizam and Haider, the control rate of uterine and vaginal compression on primary PPH was 89.14%.¹¹ Haq and Yabbyab also reported similar results (85%).²

Akhter et al, among patients treated with balloon inflation technology, found that 56.5% had success.¹² Numerous case reports and case series have been published in which the balloon catheters have been used successfully used for the treatment of PPH.¹³ Diemert et al have shown that they successfully controlled 60% of PPH.¹⁴

Mechanical compression of the uterine sinuses is a fast and effective method that can ensure homeostasis in many cases.¹¹ Makosso et al had a success rate of 91.9% in an environment that caused PPH.¹⁵ Previous studies have shown that balloon tamponade is good for large PPH regardless of the cause, and it is recommended that balloon tamponade should be a part of all PPH management procedures.^{16,17}

CONCLUSION

Balloon inflation technique was more effective than uterovaginal packing technique in controlling primary postpartum hemorrhage.

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