Original Article

Assessment Of Efficacy Of Balloon Tamponade In The Management Of Postpartum Haemorrhage

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Abstract

Background: Post-partum hemorrhage (PPH) remains a major cause of maternal death with uterine atony implicated in up to 80% of all bleedings. The present study was conducted to assess efficacy of balloon tamponade in the management of postpartum hemorrhage.

Materials & Methods: 45 patients of postpartum hemorrhage were managed with balloon tamponade.

Results: The mean height was 63.2 cms, weight was 145.2 kgs, gravida was 2.5 and gestational age was 37.2 weeks. Pre-balloon and post-balloon BMI (Kg/m2) was 27.2 and 28.9, multiple pregnancies was 24 and 11, and history of uterine surgery was seen in 11 and 14, mean haemoglobin was 12.4 and 12.4 respectively. The difference was significant (P< 0.05). There were 25 patients with any invasive procedure and 12 and overall transfusion was seen in 42 and 16 in pre- balloon and post- balloon cases respectively. The difference was significant (P< 0.05).

Conclusion: The implementation of IUTB in PPH protocol for caesarean delivery was associated with a drastic drop in second-line invasive procedures.

Keywords: Caesarean, Post-partum hemorrhage, balloon tamponade

INTRODUCTION

Post-partum hemorrhage (PPH) remains a major cause of maternal death with uterine atony implicated in up to 80% of all bleedings. First-line treatment includes oxytocin followed, when needed, by prostaglandins.[1] In case of failure of these first-line treatments, second-line invasive therapies such as artery ligation, uterine compressive suture and/or radiological artery embolization have to be implemented. Each of these treatments can be performed alone or they may be also combined, with failure leading to hysterectomy. Because of the invasive character and inherent morbidity of these second-line therapies.[2]

Balloon tamponade has become an important part of our armamentarium for the management of Postpartum hemorrhage (PPH).[3] There are now several different devices being used for this purpose, some specifically designed for PPH and some used off-label. These balloon devices have been used following vaginal delivery and caesarean section, in women with postpartum uterine atony and in patients with contracted uteri but bleeding from other causes such as placenta accrete or post abortal hemorrhage.[4] Challenges during balloon filling include the requirement to apply high amounts of physical force to, and repeatedly fill and empty, the syringe used to deliver the fluid to expand the balloon, which can cause delay in achieving adequate tamponade.[5] The present study was conducted to assess efficacy of balloon tamponade in the management of postpartum hemorrhage.

MATERIALS & METHODS

The present study comprised of 45 patients of postpartum hemorrhage. All patients were enrolled after obtaining their written consent.

Data such as name, age etc. was recorded. Obstectric & temponade system (OTS) was used which had a uterine balloon and a vaginal balloon. Vaginal bleeding can also be controlled by the vaginal tamponade balloon. In all females, blood pressure prior to balloon inflation was recorded. The time to maximum inflation, volume of saline infused, and pressure within the balloon were recorded. All underwent ultrasound evaluation of the uterus before and during the balloon inflation and colour and pulsed wave Doppler examinations of the uterine artery flow velocity pattern were recorded. The amount of blood draining from the drainage channel of the catheter was recorded. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I: Baseline characteristics

Parameters	Mean	SD
Height	63.2	2.7
Weight	145.2	7.1
Gravida	2.5	1.1
Gestational age (weeks)	37.2	1.8

Table I shows that mean height was 63.2 cms, weight was 145.2 kgs, gravida was 2.5 and gestational age was 37.2 weeks.

Table II: Assessment of parameters

Parameters	Pre-Balloon	Post-Balloon	P value
BMI (Kg/m^2)	27.2	28.9	0.12
Multiple pregnancies	24	11	0.01
History of uterine surgery	11	14	0.05
Haemoglobin	12.4	12.4	1

Table II, graph I shows that pre-balloon and post-balloon BMI (Kg/m2) was 27.2 and 28.9, multiple pregnancies was 24 and 11, history of uterine surgery was seen in 11 and 14, mean haemoglobin was 12.4 and 12.4 respectively. The difference was significant (P< 0.05).

Graph I: Assessment of parameters

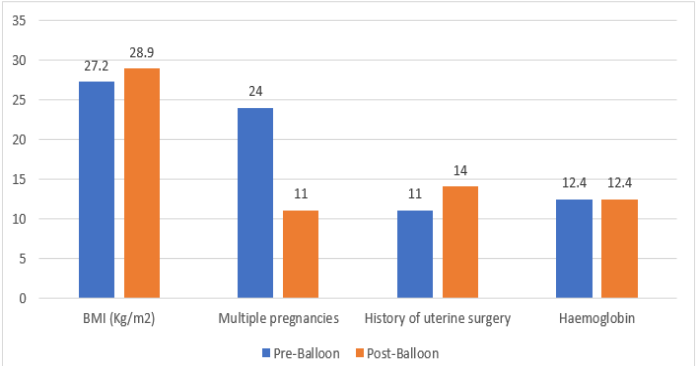

Table III: Rates of the various invasive procedures implemented

Outcome	Pre-Balloon	Post-Balloon	P value
Patients with any invasive procedure	25	12	0.01
Overall transfusion	42	16	0.05

Table III shows that there were 25 patients with any invasive procedure and 12 and overall transfusion was seen in 42 and 16 in pre- balloon and post- balloon cases respectively. The difference was significant (P< 0.05).

DISCUSSION

Post-partum hemorrhage (PPH) remains a major cause of maternal death with uterine atony implicated in up to 80% of all bleedings.[6] First-line treatment includes oxytocin followed, when needed, by prostaglandins.[7] In case of failure of these first-line treatments, second-line invasive therapies such as artery ligation, uterine compressive suture and/or radiological artery embolization have to be implemented. Each of these treatments can be performed alone or they may be also combined, with failure leading to hysterectomy.[8] Because of the invasive character and inherent morbidity of these second-line therapies, alternative approaches have been suggested: the Blakemore probe first, and then a few other devices, among which the intra-uterine tamponade balloon (IUTB) has triggered much interest.[9] The present study was conducted to assess efficacy of balloon tamponade in the management of postpartum hemorrhage.

We found that the mean height was 63.2 cms, weight was 145.2 kgs, gravida was 2.5 and gestational age was 37.2 weeks. Mishra ET al[10] found that the mean heights of patients was 62± 2.7 inches, weight (145± 12 pounds), Gravidity/Parity (2 [1–6]/1), type of delivery was vaginal (12) and caesarean (4) and gestational age was 37.6± 1.4 weeks. The mean systolic blood pressure was 106.42 mm Hg, maximum volume infusion was 960 mL, pressure at maximum value was 58.22 mm Hg and estimated blood loss was 440 ml.

We found that pre-balloon and post-balloon BMI (Kg/m2) was 27.2 and 28.9, multiple pregnancies was 24 and 11, and history of uterine surgery was seen in 11 and 14, mean haemoglobin was 12.4 and 12.4 respectively. Soued ET al[11] included women with post-partum hemorrhage requiring potent uterotonic treatment with prostaglandins after caesarean

delivery over a 9-year period were eligible. The primary outcome was the rate of invasive procedure (conservative surgery, radiological embolization and/or hysterectomy). $P < 0.05$ was considered statistically significant. A total of 279 patients were included (140 vs. 139). Most baseline characteristics were comparable between the two studied periods. The success rate of the intra-uterine tamponade balloon was 82%, and no related complications occurred. Rates of invasive procedures and transfusion were significantly reduced (28.6% vs. 11.5%, $p < 0.001$ and 44.3% vs. 28.1%, $p = 0.006$ respectively) during the "post-balloon" period, and length of hospital stay was shorter ($p < 0.001$). Implementation of intra-uterine tamponade balloon during post-partum hemorrhage after caesarean delivery appears to be safe and effective, with a decrease in both invasive procedures and transfusion rates.

We observed that there were 25 patients with any invasive procedure and 12 and overall transfusion was seen in 42 and 16 in pre- balloon and post- balloon cases respectively. Cho Y et al[12] demonstrated cessation of bleeding in a PPH patient after 320 mL of saline was placed in an intrauterine Senstaken Blakemore tube. Postplacement ultrasound in their case demonstrated that the inflated balloon was not in the fundus but in the lower uterine segment and that it was not tamponading an area of myometrium sufficient to be effective at controlling PPH. They suggested that the mechanism of action was by uterine artery compression rather than direct myometrial tamponade.

The limitation the study is small sample size.

CONCLUSION

Authors found that the implementation of IUTB in PPH protocol for caesarean delivery was associated with a drastic drop in second-line invasive procedures.

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