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Original Research Article

Study of uterine artery embolization: a newer modality in secondary PPH

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ABSTRACT

Background: Postpartum hemorrhage remains a major cause of both maternal mortality and morbidity worldwide. This study reflects the clinical outcomes including clinical effectiveness, and safety of uterine artery embolization (UAE) for the treatment of obstetrical uterine hemorrhage at a tertiary-care hospital, in terms of secondary PPH.

Methods: The data were collected as a retrospective study from SAMC and PGI obstetric and gynecology department 12 women with secondary pph were included in the study.

Results: With the use of uterine artery embolization 12 women were successfully treated amongst them maximum patients were in 26-35 yrs of age and mean age of women were 32.4yrs and gravidity of patients presenting with pph is 3 or more.

Conclusions: Selective UAE is a safe and effective method to control obstetric hemorrhage. Blood product requirements after UAE were low, and the surgical risks and absolute loss of fertility associated with hysterectomy were avoided.

Keywords: Maternal mortality, PPH, Secondary PPH, UAE

INTRODUCTION

Postpartum hemorrhage remains a major cause of both maternal mortality and morbidity worldwide more so in developing countries with an estimated mortality rate of 140,000 per year or one maternal death every four minutes.¹ Postpartum hemorrhage is a nightmare for an obstetrician.

PPH is often classified as primary/immediate/early, occurring within 24 hours of birth, or secondary/delayed/late, occurring more than 24 hours post-birth to up to 12 weeks postpartum. In addition, PPH may be described as third or fourth stage depending on whether it occurs before or after delivery of the placenta, respectively.

Uterine atony and retained placental tissue are the leading underlying aetiologies for primary pph whereas secondary pph can be due to infection or retained products of conception. 1-2% of pregnancies are complicated by secondary pph and in developing countries it is a major contributor to maternal death.²

Risk factors for PPH include; past history of PPH, multiple pregnancies, fetal macrosomia, primigravida, grand multiparity, older age, preterm births, genital tract injuries, non-use of oxytocics for PPH prophylaxis, labour induction, cesarean birth and intra-uterine fetal deaths, chorioamnionitis.³ Management involves four components all of which must be taken simultaneously, communication, resuscitation, monitoring investigation and arresting the bleeding by medical intervention

followed by surgical intervention.⁴ Majority of patients responds with medical management only. For surgical intervention senior obstetrician in a well-equipped center for blood and blood products and operation theater is required.

Uterine artery embolization is useful in situations in which preservation of fertility is desired when surgical options have been exhausted in controlling PPH both atonic and traumatic. The procedure appears to be less time consuming, poses less instability to hemodynamic status and is relatively free from long-term complications.⁵

Use of polyvinyl alcohol particles is, however, permanent. It usually offers very high success rate of 75 - 100%. Elective can be done in known or suspected cases of placenta accrete such as placenta previa or previous cesarean section scar diagnosed by Ultrasonography (USG) or Magnetic Resonance Imaging (MRI).⁶

This study was conducted in Sri Aurobindo medical college and postgraduate institute Indore to evaluate the safety, efficacy, and outcome of performing uterine artery embolization in secondary PPH.

The aim of the study was to investigate and to analyze and report the clinical outcomes including clinical effectiveness, And the safety of uterine artery embolization (UAE) For the treatment of obstetrical uterine hemorrhage at a tertiary-care hospital, in terms of secondary PPH.

METHODS

The Present study was carried out in the Department of Obstetrics and Gynecology, Sri Aurobindo Medical College and Postgraduate Institute, Indore, with the permission from the institutional ethics committee and after obtaining voluntary informed consent from the patients.

It is a retrospective observational study, comprised of 12 clinically diagnosed cases of secondary PPH who presented in the Department of Obstetrics and Gynecology, Sri Aurobindo Medical College and Postgraduate Institute, Indore from October 2015 to october 2017.

UAE was performed only after all usual obstetric maneuvers for the treatment of PPH were used. Gelatin Sponges /polyvinyl alcohol are injected into the bleeding vessel until stasis of flow in target vessel is achieved. Access via femoral to internal iliac and subsequently the uterine arteries.

Inclusion criteria

Patients with secondary PPH (from 24 hrs of delivery to six weeks postpartum), Both cesarean section and normal

vaginal delivery cases with secondary PPH were included.

Exclusion criteria

All women who underwent UAE for nonobstetric reasons (those with leiomyoma- or tumor- were excluded).

The patients were analyzed based on age, gravidity, number of transfusion, days of secondary pph presentation, a complication of uterine artery embolization and causes of secondary postpartum hemorrhage.

RESULTS

In Table 1 Distribution of women having secondary pph in relation to age. In 20-25 years of age 2 (16.6%) patients had secondary pph, while in 26-35 years maximum women were affected i.e. 50% and in 35years and above 4 (33.3%) women had secondary pph.

Mean age of presentation of secondary pph was 32.4 years.

Table 1: Distribution of women according to age group.

Age (years)	N (12) patients	Percentage
20-25	02	16.6
26-35	06	50
>35	04	33.33

In Table 2 there is distribution of women with secondary pph in relation to gravidity.

Table 2: Distribution of women according to gravidity.

Gravidity	N (12) patients	Percentage
G1	02	16.6
G2	03	25
≥G3	07	58.33

There were only 2(16.6%) women who were primigravidae who had secondary pph, 3 (25%) women were second gravida and 7 (58.33%) women who had secondary pph were grandmultipara.

Table 3: Distribution women according to days of presentation with secondary pph.

Days of presentation	N (12) patients	Percentage
04-15	04	33.33
16-35	06	50
>35	02	16.66

Grandmultipara is itself an independent risk factor for adverse pregnancy outcome and in present study, there is

significant incidence of secondary pph with grandmultipara is shown. Mean gravidity came to be 2.6.

The Table 3 shows need for re-admission due secondary pph in post-partum period within first two week 4 (33.33%) women had secondary pph, in 3rd and 4th week maximum women turned up i. e. O6 (50%) women and only 2 (16.66%) women had secondary pph after 4 weeks.

Being a tertiary care centre both unbooked and referred cases of secondary pph are directed to us in need for management. Mean days of presentation of secondary pph is 25 days of post partum.

Table 4: Distribution of women according to pre-embolisation transfusion requirement.

Preembolization transfusion requirement (units)	N (12) patients	Percentage
0-1	07	58.33
2-3	04	33.33
>3	01	8.3

Table 4 illustrate the need for transfusion in relation to preembolisation, only 1 unit is required in 7 (58.33%) patients in present study, 2-3 units were required by 4 (33.3%) women with secondary pph and more than 3 units on 1 (8.3%) women.

Mean transfusion requirement preembolisation is 2 units in present study.

Fresh frozen plasma, platelet concentrate, platelet rich plasma and cryoprecipitate were also transfused but these blood products are not included for the study.

Table 5: Distribution of women according to cause of secondary pph.

Cause	N (12) women	Percentage
Morbidly adherent placenta	10	83.3
Uterine haematoma (Traumatic pph)	02	16.66

Table 4 narrates the causes of secondary pph 10 (83.3%) women had morbidly adherent placenta and 2 (16.66%) women had uterine haematoma due to infection mainly due to puerperal fever, sepsis.

Risk factors for uterine haematoma include grand multiparity, low socioeconomic status, malnutrition, anemia. Significant percentage of women had secondary pph due to morbidly adherent placenta.

Table 6 outline the various complications after the uterine artery embolisation procedure hypomenorrhoea was seen with the 4 (33.33%) women, fever was present in 2

(16.66%) cases, infertility in 1(8.33%) women, 7 (58.33%) had no complication.

Table 6: Distribution of women according to complications post UAE.

Complications	N (12) patients	Percentage
Hypomenorrhoea	04	33.33
Fever	02	16.66
Infertility	01	08.33
None	07	58.33

Thus, a significant number of cases had no complications representing uterine artery embolisation as a safe, effective and a fertility preserving method in cases of secondary pph.

Clinical success rate and effectiveness came to be 100% in our study. There was no mortality due to secondary pph, it was noted all the women with secondary pph had tachypnoe, tachycardia, consciousness, hypotensive.

Being a tertiary care centre, all the patients were managed properly without any delay with the availability of round the clock trained staff and availability of blood and blood products.

DISCUSSION

Present observations support the role of UAE as a safe effective alternative to surgery in the management of PPH in sick and unstable postpartum women. The procedure appears to be less time consuming, poses less instability to hemodynamic status and is relatively free from long-term complications. However, availability of sophisticated equipment and well trained interventional radiologist are the key factors against the procedure to gain acceptance and popularity as the first-line modality for management of PPH.⁷

Vishalakshi et al reported 5 of their patients were successfully managed with complete cessation of hemorrhage.⁷ They also reported the procedure appears to be successful even in the patients presenting later than 6 hours from the onset of bleeding in their study there were no intervention-related complications in any patients and even one patient conceived 11 months following the procedure. In present study, clinical effectiveness came to be 100%

In all situations, pluridisciplinary management of patients with involvement of interventional radiologists, anesthesiologists, and obstetricians is mandatory

Jung HN et al reported in their study by uterine artery embolization they were able to successfully control PPH in 14 patients (82.4%).⁸ Only Three patients underwent a hysterectomy after UAE failed to stop the bleeding. They also reported UAE appears to be a safe and effective

means by which to control PPH. In the present study, none of the patients required hysterectomy after UAE.

Park JK they evaluated the efficacy of uterine artery embolization (UAE) for controlling postpartum hemorrhage (PPH), 23 women with intractable PPH underwent UAE.⁹ Specific diagnoses included uterine atony, placenta accreta, puerperal hematoma and placental polyp amongst them 10 patients with uterine atony, treatment with UAE failed in two women with severe vasoconstriction. 8 patients with placenta accreta were treated successfully with the placement of multiple sutures in the placental bed and UAE. 2 of the 3 women with placental polyps were treated successfully with UAE and packing of the uterus. In the present study, the cause of secondary pph is like above study.

Cheng H et al reported hypomenorrhea was common after UAE treatment (55.6%). 4 women had abdominal pain or lower back pain 2 women had urinary frequency, and 1 woman had the pelvic inflammatory disease.¹⁰ In present study only 33.33% had hypomenorrhoe and 58.33% had no complications.

CONCLUSION

Selective UAE is a safe and effective method to control obstetric hemorrhage. This technique might be considered as a choice before performing a furthermore destructive surgery. Blood product requirements after UAE were low, and the surgical risks and absolute loss of fertility associated with hysterectomy were avoided. Interventional radiology and UAE should be included in rapid-response team plans to optimize outcomes of women with PPH.

With the satisfactory results mentioned above, it seems that a patient with secondary post-partum hemorrhage the UAE could be an appropriate method of choice.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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