

## Incidence of Undiagnosed Occult Post-Partum Haemorrhage Based on Change in Haematocrit: A Retrospective Observational Study at a Tertiary Care Hospital of Armed Forces

Brijesh Kumar Singh<sup>1</sup>, Nagaraja N<sup>2</sup>, Mohd Rasheed<sup>3</sup>, Charu Jain<sup>4</sup>, Tania Singh<sup>5</sup>, Shahla Yazdani<sup>6</sup>

<sup>1</sup>Junior Resident, Department of Obstetrics and Gynaecology, Command Hospital Air Force Bangalore, Karnataka, India

<sup>2</sup>Professor, Department of Obstetrics and Gynaecology, Command Hospital Air Force Bangalore, Karnataka, India

<sup>3</sup>Professor, Department of Obstetrics and Gynaecology, Command Hospital Air Force Bangalore, Karnataka, India

<sup>4</sup>Assistant Professor, Department of Obstetrics and Gynaecology; Command Hospital Air Force Bangalore, Karnataka, India

<sup>5</sup>Senior Resident, Department of Obstetrics and Gynaecology, Command Hospital Air Force Bangalore, Karnataka, India

<sup>6</sup>Associate Professor, Department of Obstetrics and Gynaecology, Command Hospital Air Force Bangalore, Karnataka, India

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Received: 01-02-2024 Revised: 15-03-2024 / Accepted: 21-04-2024

Corresponding author: Dr. Mohd Rasheed

Conflict of interest: Nil

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### Abstract

**Background:** Post-partum haemorrhage is the leading cause of maternal death in India. However, it is not accurately and adequately diagnosed resulting from inaccurate and suboptimal estimation of blood loss in absence of hemodynamic instability in low risk pregnancies. This study was undertaken to ascertain the incidence of undiagnosed occult post-partum haemorrhage in low risk pregnancies.

**Material & Methods:** Total of 280 low risk pregnancies out of 957 deliveries at Command Hospital Air Force Bangalore for one year period was evaluated for more than 10% drop in haematocrit during pre and post-delivery period.

**Result:** Incidence of occult post-partum haemorrhage was found to be 16.78% in low risk pregnancies. 57% of occult post-partum haemorrhage was seen in 19-30 years age group compared to 43% in 31-35 years age group. Majority (62%) of occult post-partum haemorrhage was seen in multiparous compared to primiparous (38%).

**Conclusion:** Monitoring of post-natal mothers should invariably include haematological evaluation to look for significant drop in haematocrit and post-partum anaemia.

**Keywords:** Occult post-partum haemorrhage, Haematocrit, low-risk pregnancy, Post-partum Anaemia.

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### Introduction

Child birth is both the most beautiful as well highly vulnerable event in life of women. It is associated with many desirable and undesirable changes in life and body of women. However, the process of delivery is associated with many life-endangering risks.

Any nation's commitment to good health services can measure by surrogated indicators of perinatal mortality and Maternal Mortality [1]. Sever bleeding during and after delivery if the single most common cause of maternal mortality in world [2]. Worldwide, PPH is responsible for about 25% of women who die of pregnancy related morbidities

[3]. Post-partum haemorrhage accounts for 38% of maternal deaths in India [4]. Western countries also list the severe blood loss during delivery among most important causes of maternal deaths.

The American College of Obstetricians and Gynaecologists' (ACOG) revitalize program defines postpartum haemorrhage as cumulative blood loss greater than or equal to 1,000 mL or blood loss accompanied by signs or symptoms of hypovolemia within 24 hours after the birth process (includes intrapartum loss) regardless of route of delivery [5]. Traditionally, postpartum haemorrhage was defined as an estimated blood

loss in excess of 500 mL after a vaginal birth or a loss of greater than 1,000 mL after a cesarean birth [6]. A drop in haematocrit by 10% had been proposed as an alternative marker to define postpartum haemorrhage [7].

Continuous but slow bleeding during postnatal period might not create an alert for healthcare provider. However, such slow but continuous blood loss can cause post-partum anaemia and increase the maternal morbidity. The need was felt to ascertain the prevalence of such type of occult post-partum haemorrhage. So, the present study is designed to ascertain the incidence of occult post-partum haemorrhage

**Materials and Method**

This was a retrospective study conducted in Department of Obstetrics and Gynaecology at Command Hospital Air Force Bangalore. Diagnosis of occult post-partum haemorrhage was taken as a reduction of more than 10% in Haematocrit between pre delivery and post delivery period.

Haematocrit was checked while admitting in labour room for delivery and on post-natal day 2 using Fully Automatic 5-Part Sysmex XN-330 Haematology Analyzer at department of Pathology, Command Hospital Air Force, Bangalore.

After Ethical clearance from the Institutional Ethical Committee, ladies who delivered between 01 Oct 22 to 30 Sep 23, aged between 18 years to 35 years for whom details of Hematological investigations were available were included in the study based.

Cesarean delivery, instrumental deliveries, Multifetal gestation, Pre-Eclampsia, diagnosed case of antenatal anaemia (<10.5 gm/dl) and diagnosed case of Post-Partum Haemorrhage were excluded from the study.

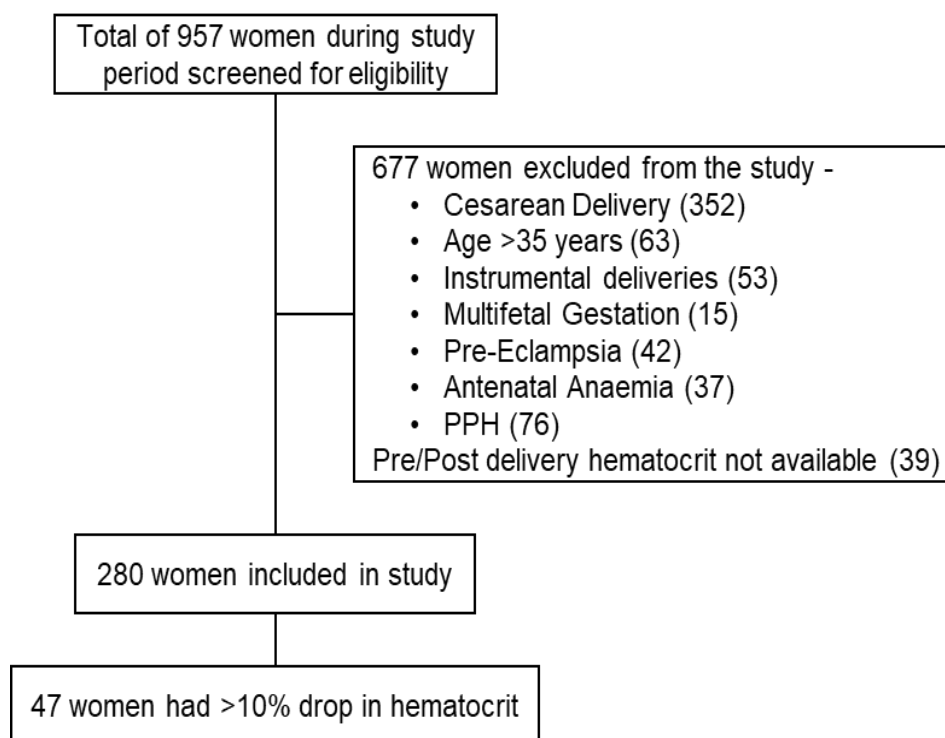
**Statistical Analysis**

The recorded data was compiled and entered in a spreadsheet (Microsoft Excel) and then exported to data editor of SPSS Version 21. Continuous variables were expressed as Mean ± SD and categorical variables were summarized as frequency tables.

**Results**

During the study period, total of 957 women delivered at our hospital and were screened for this study.

We excluded 677 based on various predetermined exclusion criteria. Final sample comprehended 280 women (Figure 1).



**Figure 1: Screening and Enrolment in the study**

Based on selected diagnosis criteria 47 (16.78%) women were found to have more than 10% reduction in haematocrit form pre delivery level to post-partum period (Figure 2).

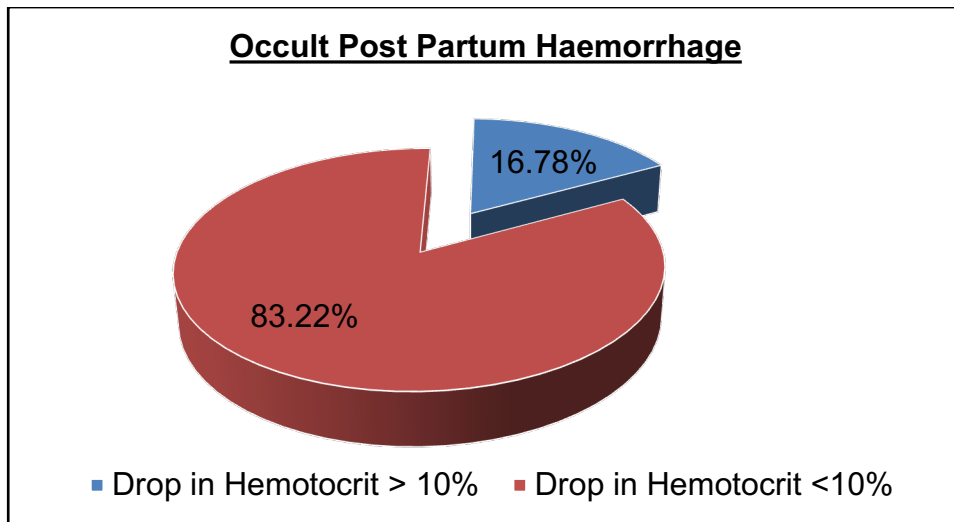


Figure 2: Percentage of Occult PPH

The mean age of these women was  $26.89 \pm 4.63$  years in cases. 27 (57%) post-partum women were aged between 19 years to 30 years and 20 (43%) were in age group 31 years to 35 years (Figure 3).

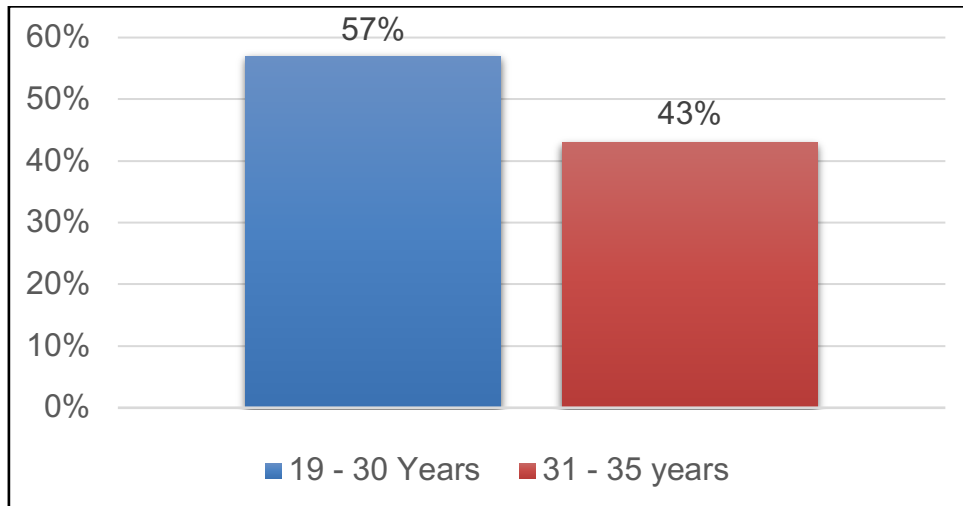


Figure 3: Distribution of cases according to age (years)

29 (62%) of cases were multiparous and 18 (38%) of cases were primiparous (Figure 4).

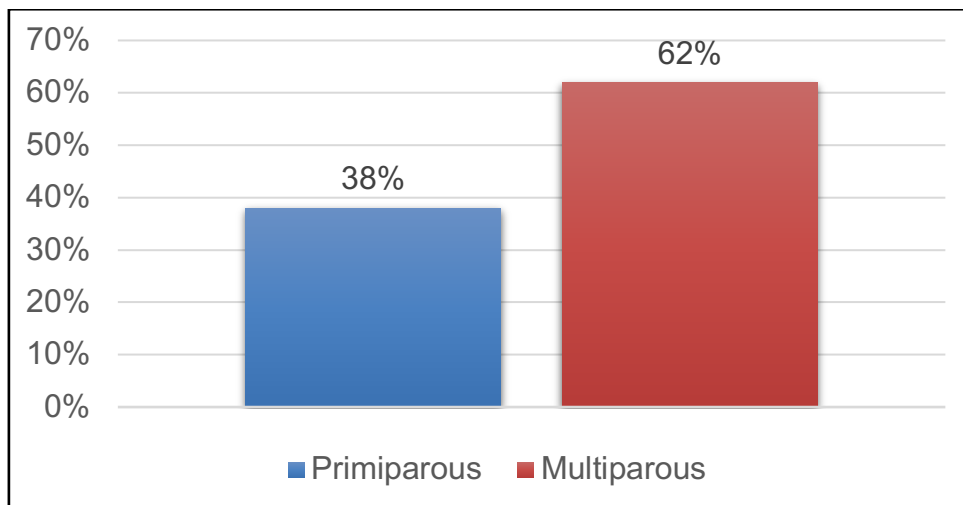


Figure 4: Distribution of cases according to parity

## Discussion

Our study investigated and found that the incidence of occult post-partum haemorrhage is 16.78% for low risk group. This is considerably higher than the incidence of post-partum haemorrhage in vaginal deliveries in India [8]. This incident of incidence of post-partum haemorrhage based on haematocrit is matching with the 16.2% and 14.8% incidence found in the studies conducted in 426 women who delivered at tertiary care hospital in Tanzania [9] and 500 women who delivered at tertiary care hospital at Shivamogga, Karnataka [10].

Occult PPH was seen more in age group of 19 years to 30 years age group compared to > 30 years. These findings were similar to the findings of study conducted by Rajeshwari et al at a tertiary care hospital in Bangalore [11]. However, Rajput N et al in their study in Gwalior indicated that incidence of post-partum haemorrhage increases with age [12]. However, they included visible post-partum haemorrhage in their assessment.

We present hypothesis that as visible post-partum haemorrhage is more common with increasing age compared to young age, but chances of occult post-partum haemorrhage are more common with younger age group. In our analysis, we found that occurrence of occult post-partum haemorrhage is more common with multiparous women compared to primiparous women. Chandrika SK et al noted in their study that multiparous women were more prone for post-partum haemorrhage [13]. In a study of 80 cases of PPH, Yogesh T et al. noted that PPH was common with higher parity [14].

Our study did not consider some of the confounding factors which can cause changes in the haematocrit such as the duration of labour which, if prolonged, is associated with dehydration and will alter the haematocrit. This study also did not consider the intrapartum interventions like intravenous fluid and augmentation of labour. The amount of fluid received during intrapartum period will also affect the change of haematocrit leading to wrong diagnosis of postpartum haemorrhage.

## Conclusion

Post-partum haemorrhage is the most common cause of maternal mortality in developing countries. Even in absence of visible post-partum haemorrhage, occult post-partum haemorrhage can lead to post-partum anaemia and hence increasing the anaemia related morbidity in such women. Moreover, if not identified and corrected on time, these women will become more prone to developing post-partum haemorrhage in subsequent pregnancies. Visible blood loss or hemodynamic instability can identify the acute blood loss during post-partum period. Slow but continuous per vaginum bleeding may be at lower than the

threshold of commonly accepted definition of post-partum haemorrhage. But, if continued for longer duration, it will increase the risk and morbidity for the women. Hence, we conclude that the changes in haematocrit should be monitored and if found abnormal, should be acted upon with corrective actions.

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