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Research Article

A study of risk factors of postpartum hemorrhage and indications for caesarean section

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ABSTRACT

Background: To prevent post-partum hemorrhage the concept of active management of third stage of labour has been proposed which decreases the blood loss by 40-68%. The best preventive strategy is active management of the third stage of labour. The objective of the study was to study risk factors of postpartum hemorrhage and indications for caesarean section.

Methods: A hospital based cross sectional study was carried out among 100 women at term for a period of one year. Pregnant women who are at term i.e. at 38-39 weeks of gestation were included in the study. Detailed history, clinical examination and investigations were carried out.

Results: The mean pre pregnancy BMI in study group was 22.4 ± 3.96 . The majority of patients recruited were primiparous. Socio-demographic data shows that there was no statistical difference in place of residence, occupation and level of literacy between two groups. The prevalence of anemia among women at term was found to be 43%. The most common obstetric high risk factor was gestational diabetes mellitus in 10% followed by gestational hypertension in (6%). 71% of women underwent the emergency LSCS. The most common indication for LSCS was fetal distress in 29% of cases followed by mal-presentation in 12% of cases.

Conclusions: The prevalence of anemia among women at term was found to be 43%. The different medical high risk factors were human immunodeficiency virus positive (asymptomatic diagnosed during pregnancy), Hepatitis B antigen positive, cardiovascular risk, hypothyroidism, epilepsy observed in the groups. Other high risk factors included asthma, Crohns disease, and systemic sclerosis.

Keywords: Postpartum hemorrhage, Caesarean section, Term pregnancy

INTRODUCTION

Postpartum hemorrhage still remains a leading cause of maternal mortality, especially in developing countries (Ronsmans 2006).¹ postpartum hemorrhage accounts for 33% of maternal deaths in India (NFHS3 2006).^{2, 3, 4} It occurs in over 10% of all births and is associated with a case fatality rate of 1-2%.⁵ Of the 14 million women who have postpartum hemorrhage each year, about 2% die, with an average interval from onset of bleeding to death being 2 to 4 hours.¹ Although many deaths from postpartum hemorrhage occur outside healthcare

facilities, a significant number occur in hospitals, where effective emergency care has the potential to save lives.⁶ Postpartum haemorrhages is also an important cause of maternal mortality even in high income countries, accounting for about 13% of maternal deaths.^{7,8} In confidential enquiries into maternal deaths in South Africa (Confidential enquiries 2006), 383 maternal deaths due to postpartum hemorrhage were reported and the majority of these were considered to be preventable.⁹ Of these deaths, 67 were caused by uterine atony, where uterotonics were required to control the bleeding. Other cases of maternal death from Postpartum hemorrhage

were due to uterine rupture (37 in women with previous caesarean sections and 43 in women without previous caesarean sections), retained placenta (88), inverted uterus (7), and other genital tract trauma including caesarean section (141).⁹ The great majority were thus not due to uterine atony, and attempts to address the problem need to go beyond the use of uterotonic drugs.

To prevent post-partum hemorrhage the concept of Active Management of Third Stage of Labour has been proposed which decreases the blood loss by 40-68%.¹⁰⁻¹² The best preventive strategy is active management of the third stage of labour and the number needed to treat [NNT] to prevent one case of postpartum hemorrhage is 12.¹³ Hospital guidelines encouraging this practice have resulted in significant reductions in the incidence of massive hemorrhage.¹⁴ Active management, which involves administering a uterotonic drug with or soon after the delivery of the anterior shoulder, controlled cord traction, and usually early cord clamping and cutting, decreases the risk of postpartum hemorrhage and shortens the third stage of labour with no significant increase in the risk of retained placenta.¹⁵ Compared with the expectant management, in which the placenta is allowed to separate spontaneously, active management significantly decreases the incidence of postpartum hemorrhage.¹⁶

METHODS

A hospital based cross sectional study was carried out among 100 women at term for a period of one year. Institutional Ethics Committee permission was obtained prior to the study. Informed written consent was obtained from all women.

Pregnant women who are at term i.e. at 38-39 weeks of gestation were included in the study. Detailed history including age, parity, residence, occupation, literacy status, period of gestation was taken. History was enquired into obstetric risk factors like gestational diabetes mellitus, gestational hypertension etc.

Detailed examination like blood pressure, premature rupture of membranes, height, and weight was done. Based on height and weight, body mass index was calculated.

Investigations like hemoglobin, Rh status, ultra sonography, HIV and Hepatitis B, and thyroid profile were carried out.

Data was entered in statistical software and analysed using proportions.

RESULTS

The mean pre pregnancy BMI in study group was 22.4 ± 3.96 . The majority of patients recruited were primiparous.

Table 1: Demographic characteristics.

Component	N = 100
Age in yrs < 19	2%
20-30	61%
> 30	37%
Mean age (yrs)	27.70
BMI normal (18-24.9)	86%
over weight (25-29.9)	14%
Mean BMI	22.4
Parity primi	68%
Multi	29%
Grand multi	3%

Table 2: Socio-demographic data distribution.

	N = 100
Residence rural	31%
Urban	69%
Occupation house wife	61%
Unskilled	17%
Skilled	22%
Literacy illiterate	37%
Literate	63%

Socio-demographic data shows that there was no statistical difference in place of residence, occupation and level of literacy between two groups.

Table 3: Mean period of gestation.

Mean period of gestation	Mean \pm 2SD(wks)	95% CI
N = 100	38.14 \pm 0.83	37.98-38.31

The mean period of gestation was 38.14 weeks. It implied that all women were near term pregnancy.

Table 4: Mean period of gestation.

	N = 100
Anemia; No anemia (Hb \geq 11 g%)	47%
Mild anemia (Hb = 10-10.9 g%)	28%
Moderate anemia (Hb = 7-9.9 g%)	25%

The prevalence of anemia among women at term was found to be 43%. Mild anemia was seen in 28% of women and moderate anemia was observed in 25%. No one was found to have severe anemia (Table 4).

The most common obstetric high risk factor was gestational diabetes mellitus in 10% followed by gestational hypertension in 6% (Table 5).

The different medical high risk factors were human immunodeficiency virus positive (asymptomatic diagnosed during pregnancy), Hepatitis B antigen positive, cardiovascular risk, hypothyroidism, epilepsy

observed in the groups. Other high risk factors included asthma, Crohns disease, and systemic sclerosis (Table 6).

Table 5: Distribution of various obstetric high risk factors.

	N = 100
Gestational diabetes mellitus on diet	10%
on insulin	1%
Gestational hypertension	6%
Mild preeclampsia	1%
Chronic hypertension	3%
Oligohydromnios	2%
Premature rupture of membranes	1%
Rh-negative, ICT negative	3%
Rh-immunised	1%
Fetal B/L hydronephrosis	1%
Fetal Congenital cystadenomatous malformation	1%
Mild IUGR	4%
Fetal congenital diaphragmatic hernia	-

Table 6: Distribution of various medical high risk factors.

Medical high risk factors	Percentage
Human immunodeficiency virus (positive)	5%
Hepatitis B antigen positive	1%
Ventricular septal defect	1%
Rheumatic heart disease	1%
Hypothyroidism	8%
Epilepsy	2%
Others	2%

Table 7: Various characteristics of caesarean section.

Variable	Component	N = 100
Type of caesarean	elective	29%
	emergency	71%
Anesthesia	spinal	95%
	GA	3%
	epidural	2%
Duration of surgery (min)		46.7±5.6

Table 7 shows various characteristics of women undergoing lower segment caesarean section (LSCS). 71% of women underwent the emergency LSCS. In 95% of cases spinal anesthesia was used. The mean duration of surgery was 46.7 min.

The most common indication for LSCS was fetal distress in 29% of cases followed by mal-presentation in 12% of cases (Table 8).

Table 8: Indications for caesarean section.

	N = 100
Fetal distress	29%
MSL	11%
mal presentation	12%
Arrest of cervical dilatation	10%
IVF	5%
Poor BPP	4%
Filed induction	3%
HIV+ve	5%
Cephalo pelvic disproportion	8%
Caesarean on maternal request	6%
Others	7%

DISCUSSION

In the present study the mean age of patient was 27.70 yrs which was less than the study by Gai et al which was 29.71±4.18 yrs, but similar to the study of Movafegh et al.^{16,17} (27.0±3.4 yrs) and more than the mean age in studies by Shekavat et al and Gungorduck et al which was 26yrs; Gohel et al which was 24yrs.¹⁸⁻²⁰

In the present study the pre pregnancy BMI was 22.3±3.96. On reviewing the BMI characteristics of patients included showed that the higher mean BMI range of type I obesity (31.2±3.0) was found in the study conducted by Gungorduck et al.¹⁹ The BMI of the patients included was not mentioned in the studies conducted by Movafegh et al and Shekavat et al.^{17,18} The characteristics of the patients included was described in terms of mean height and mean weight in studies conducted by Gai et al and Gohel et al, in which they were higher in Gai et al study (161.26±5.41, 72.67±9.21) than in Gohel et al (152.57±4.26, 49.71±3.65) study and the present study (150.57±4.26, 47.71±3.65).^{16,20} The similar height and weight in the patients recruited in Gohel et al and the present study could be because of the common locality of study i.e. India.²⁰

The majority of patients recruited were primipara. In the present study the parity of the patients was similar to study by Gungorduck et al.¹⁹ But in the study by Gai et al and Gohel et al the gravidity of the patients was described where in mean gravidity was lesser in Gai et al study (1.03±0.23 vs. 1.04±0.23) compared to Gohel et al study (2.1±0.95 vs. 2.08±0.86).^{16,20} In the study of Shekavat et al¹⁸ all patients were nullipara because of risk of multiparity for uterine inertia after delivery. But in studies conducted by Movafegh et al there was no description of gravidity or parity of the patients.¹⁷

In the present study predominance of urban population and higher literacy was explained by the place of study New Delhi being urban locality itself having literate population.

The level of education, residence and occupation of the patients was not described in the studies conducted by Gai et al, Gohel et al, Gungorduck et al, Movafegh et al, however there was no difference in demographic characteristics between study and control group.^{16,17,19,20} In the study by Shekavat et al most of the patients (74.4%) had >12 years education.¹⁸

In the studies conducted by Gai et al, Gohel et al, Gungorduck et al, Movafegh et al, Shekavat et al the mean period of gestation was similar to present study.¹⁶⁻²⁰

It was found that 28% patients had mild anemia and 25% had moderate anemia, similarly there was 47% of patients with no anemia.

In the studies conducted by Gai et al, Gohel et al, Movafegh et al, Shekavat et al the preoperative anemia status of the patients was not described, but in the Gungorduck et al preoperative anemia with hemoglobin <7g/dl was taken as exclusion criteria.¹⁶⁻²⁰

Different medical high risk factors like HIV+ve (asymptomatic diagnosed during pregnancy) cardiovascular risk, hypothyroidism, epilepsy were observed. The cardiovascular diseases included were ventricular septal defect, rheumatic heart disease. Other high risk factors included asthma, Crohns, systemic sclerosis, hydrocephalus with aquiductal stenosis. In the study by Gai et al and Gohel et al the obstetric high risk factors included hypertension, intrauterine growth restriction (IUGR), premature rupture of membrane, poor obstetric history but medical high risk factors had not been described which were less than the high risk factors described in the present study, still blood loss was significantly less.^{16,20}

In the study by Shekavat et al all the patients recruited were with no obstetric and medical high risk factors.¹⁸ In the study by Movafegh et al all the patients included were of class 1 (normally healthy) according the American Society of Anaesthesiologists (ASA) but little had been mentioned about the high risk obstetric and medical factors.¹⁷

All the caesarean sections were performed by consultant and senior resident staff keeping the competency in the surgical skill of all of them as similar. There were 71% emergency caesarean sections and 29% elective caesarean sections. Post operatively it was ensured that patients had no uterine atony by administering additional uterotonics so that negating the effect of uterine inertia. In the studies conducted by Gai et al, Gohel et al, Movafegh et al, Shekavat et al there was no description of type of caesarean section done.^{16-18,20}

Spinal anesthesia was administered to majority of patients i.e. 95%. The type of anesthesia varied in different studies. Gai et al conducted the study under epidural anesthesia, Gohel et al conducted the study

under spinal anesthesia, Shekavat et al conducted under general anesthesia but the present study was conducted by various types of anesthesia.^{16,18,20} However the primary outcome was not affected by the type of anesthesia as the statistical coefficient not significant.

Indications for caesarean section were fetal distress, arrest of cervical dilatation, abnormal presentation, cephalopelvic disproportion, poor biophysical profile, failed induction, in vitro fertilization conception, and human immunodeficiency virus positive, caesarean on maternal request. Present study excluded all the patients with history of caesarean section as excess loss expected because of adhesions. In the Gai et al and Gohel et al study indications for caesarean section included abnormal presentation, abnormal pelvis, fetal distress, previous caesarean section and all the indications were similar to present study except for the inclusion of patients with previous caesarean section.^{16,20}

In the study by Shekavat et al and Movafegh et al indications for caesarean section included abnormal presentation, abnormal pelvis, and fetal distress excluding those patients with previous caesarean section.^{17,18}

CONCLUSION

The prevalence of anemia among women at term was found to be 43%. The different medical high risk factors were human immunodeficiency virus positive (asymptomatic diagnosed during pregnancy), Hepatitis B antigen positive, cardiovascular risk, hypothyroidism, epilepsy observed in the groups. Other high risk factors included asthma, Crohns disease, and systemic sclerosis.

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