

*Research Article*

## Factors associated with postpartum hemorrhage maternal morbidity and mortality in Minia city hospitals a cross-sectional epidemiological survey

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### Abstract

Primary post-partum hemorrhage (PPH) is defined as excessive vaginal bleeding that occurs in the first 24 hours after delivery. Traditionally the definition of PPH has been blood loss in excess of 500 mL after vaginal delivery and in excess of 1000 mL after abdominal delivery (Leduc et al., 2009).

**Aim of the Work: The aim of this study is:** To assess factors associated with maternal morbidity and mortality in patients with postpartum hemorrhage in Minia city hospitals. **Patients And Methods:** The study was carried out at 3 hospitals (Maternity hospital of Minia university, Minia General hospital and Misr Al-horra hospital), Minia governorate Egypt. **Results:** This study was carried out at 3 hospitals (University hospital, Al-Ameri hospital and Misr Al-horra hospital) in Minia governorate Egypt. The study included a total of 308 women with age range (16-41) years who attended or referred to the 3 chosen hospitals during the study period. We excluded 8 cases.

**Key words:** (PPH) : Post-partum hemorrhage, (WHO): (World Health Organisation)

### Introduction

Primary post-partum hemorrhage (PPH) is defined as excessive vaginal bleeding that occurs in the first 24 hours after delivery. Traditionally the definition of PPH has been blood loss in excess of 500 mL after vaginal delivery and in excess of 1000 mL after abdominal delivery (Leduc et al., 2009). Postpartum haemorrhage (PPH) has been a nightmare for obstetricians since centuries in the third stage management by birth setting (Jangsten et al., 2011). Postpartum hemorrhage lead to serious maternal morbidity include cardiovascular complication, respiratory, renal, coagulation, hepatic, neurological, uterine dysfunction (Vlassoff et al., 2016).

Maternal mortality contribute a major health problem, particularly in developing countries. The global total number of maternal deaths decreased by 43 % from 532,000 in 1990 to 303,000 in 2015 (WHO, 2015). The global maternal mortality ratio (MMR) declined by 44 %, from 385 maternal deaths per 100,000 live births in 1990 to 216 in 2015, an average annual decline of 2.3 % (WHO, 2015).

Globally, there are 600,000 maternal deaths reported every year and 99% of these occur in

developing countries, among them, 27.1% of deaths are due to PPH (Say et al., 2014). Postpartum hemorrhage (PPH) is one of the leading causes of maternal morbidity and mortality in Egypt, maternal mortality rate in Egypt 52% per 100,000 live births ,the percent distribution of maternal death by postpartum hemorrhage is 19.7% (Ministry of health and population, 2013).

Clinical guidelines to treat post-partum hemorrhage (PPH) are available, but their implementation remains a great issue in resource poor settings (Tunçalp et al., 2013). The goals of PPH management should therefore be targeted to: (i) prevent hypovolemic shock by controlling blood loss at the source of the hemorrhage; (ii) ensure adequate tissue perfusion; and (iii) maintain the blood with sufficient oxygen-carrying capacity (Mohamed et al., 2011). There are three delays occurring during the diagnosis and management periods of PPH that are generally associated with a greater incidence in maternal mortality such as (delay in deciding to seek care, delay in reaching the health facility and delay in receiving quality emergency obstetric care), (Tort et al., 2015).

A better understanding of the factors associated with maternal morbidity and mortality related to PPH would help health care providers to rapidly identify women at highest risk for dying and provide appropriate care in preventing PPH and help care providers to strengthen both diagnosis and treatment of PPH among women at high risk.

### **Aim of the Work**

#### ***The aim of this study is:***

To assess factors associated with maternal morbidity and mortality in patients with postpartum hemorrhage in Minia city hospitals.

### **Patients And Methods**

#### **Study setting:**

The study was carried out at 3 hospitals (Maternity hospital of Minia university, Minia General hospital and Misr Al-horra hospital), Minia governorate Egypt.

#### **Study design:**

This study is a prospective a cross-sectional observational survey study.

#### **Study duration:**

The study was carried out during the period from December 2015 till November 2016.

#### **Ethical considerations:**

The aim and nature of the study was explained for cases before inclusion. Ethical permission was sought from a Local Research Ethics Committee.

#### **Study participants:**

A total of 308 women with age range (16-41) years who attended or referred to the 3 chosen hospitals were recruited in the study, 8 cases were excluded due to incomplete data and patient refusal. Cases per hospital were as follow:

1. Maternity hospital of Minia University (191 cases).
2. Minia General hospital (102 cases).
3. Misr Al-Horra hospital (15 cases).

*Cases were chosen according to the following:*

#### **Inclusion criteria:**

- 1) All women will give birth in the chosen hospitals complicated with postpartum hemorrhage in 1<sup>st</sup> 24 hours of labor.

#### **Exclusion criteria:**

- 1) Women with incomplete data collection during labor or postpartum period.

### **Results**

This study was carried out at 3 hospitals (University hospital, Al-Ameri hospital and Misr Al-horra hospital) in Minia governorate Egypt. The study included a total of 308 women with age range (16-41) years who attended or referred to the 3 chosen hospitals during the study period. We excluded 8 cases. The results are presented in tables from (5 to 17) and figures from (9 to 32).

**Table (1): Bivariate correlation between morbidity, mortality and other risk factors.**

Variables	Morbidity		mortality	
	<i>r</i>	P. value (Sig.)	<i>r</i>	P. value (Sig.)
Age	0.55	<b>0.012*</b>	0.38	<b>0.04*</b>
Parity	0.42	<b>0.031*</b>	0.41	<b>0.02*</b>
Residence (rural)	0.51	<b>0.00**</b>	0.43	<b>0.021*</b>
Residence to hospital (far)	0.45	<b>0.016*</b>	0.011	0.092 <sup>NS</sup>
Level of education	-0.54	<b>0.013*</b>	0.11	0.081 <sup>NS</sup>
Gestational age	-0.62	<b>&lt;0.001**</b>	0.07	0.246 <sup>NS</sup>
ANC	-0.57	<b>0.00**</b>	0.38	<b>0.02*</b>
Birth weight	-0.59	<b>&lt;0.001**</b>	0.01	0.751 <sup>NS</sup>
Medical data (positive)	0.52	<b>0.006**</b>	0.01	0.952 <sup>NS</sup>
Hospital referral	0.46	<b>0.019*</b>	0.06	0.307 <sup>NS</sup>
Hospital type	0.56	<b>&lt;0.001**</b>	0.01	0.834 <sup>NS</sup>
Blood transfusion	0.67	<b>&lt;0.001**</b>	0.05	0.439 <sup>NS</sup>
Blood units number	0.68	<b>&lt;0.001**</b>	0.52	<b>0.006**</b>

*r* = Correlation coefficient.

Grades of correlation or association: 0.00 to 0.24: weak or no association, 0.25 to 0.49: fair association, 0.50 to 0.74: moderate association, + 0.75: strong association.

NS Non-significant.

\* Significant (P.< 0.05)

\*\* Significant (P. < 0.01)

## Discussion

Post-partum haemorrhage is formally defined as the loss of at least 500 ml of blood after a vaginal birth or the loss of at least 1,000 ml of blood after a caesarean section within 24 hours of delivery (ACOG, 2006). Post-partum haemorrhage has been a nightmare for obstetricians since centuries, it is a leading cause of maternal mortality worldwide and is responsible for 34% of maternal deaths in Africa (Ujjigaa et al., 2014). There are 600,000 maternal deaths reported worldwide every year and 99% of these occur in developing countries, among them 25% of deaths in developing world are due to PPH (Gani and Ali, 2013), however, Say et al., (2014) reported 27.1%.

Globally, maternal mortality contribute a major health problem, particularly in developing countries where more than 50% of maternal deaths occurred and where the lifetime risk of maternal death is 10 times higher than that in high-income countries (WHO, 2012). The global total number of maternal deaths decreased by 43% from 532,000 in 1990 to 303,000 in 2015. The global maternal mortality ratio (MMR) declined by 44%, from 385 maternal deaths per 100,000 live births in 1990 to 216 in 2015, an average annual decline of 2.3%

(WHO, 2015). The goal 5a of the Millennium Development Goals (MDGs) calls for the reduction of maternal mortality by 75% between 1990 and 2015 (Filippi et al., 2016).

In Egypt, postpartum hemorrhage is one of the leading causes of maternal morbidity and mortality. The maternal mortality ratio declined from 84 deaths per 100,000 live births in 2000 to 54 deaths in 2009 then to 52.5 in 2013 (Ministry of health and population, 2013), but has plateaued since then. About 20% of maternal deaths nationwide are due to postpartum hemorrhage (Vlassoff et al., (2016).

## Conclusion And Recommendations

**From the previous results it can be concluded that:**

✚ Postpartum haemorrhage is an obstetrical emergency follows a delivery, it is a major cause of maternal morbidity, and one of the top three causes of maternal mortality and also, it is the leading cause of the admissions to the intensive care unit.

✚ In the present study, the incidence of PPH of different studied hospitals during the study period was, 1.68% in the University hospital, 1.96% in Al-Amiri hospital and 1.87% in Misr Al-horra hospital and the overall incidence of PPH was 1.78%.

✚ We found that the morbidity of PPH in the present study was 13.3% which is comparable with the international rates. Also, our results revealed that mortality ratio among patients who developed PPH was 3.0%. So, the calculated maternal mortality ratio due to PPH was 53/100000.

✚ The present results demonstrate that maternal age, parity, residence, level of education, ANC and blood units number were positively associated with maternal mortality.

✚ Our findings revealed that there is a significant positive correlation between morbidity and maternal age, parity, hospital type, residence (rural), residence to hospital (far), positive medical history (anemia) hospital referral and type and blood transfusion and blood units number. While, there is a significant negative association between morbidity and level of education, gestational age, ANC and birth weight.

✚ We demonstrate that increased maternal age, rural residence, far residence to hospital, positive medical history specially (anemia), illiterate education, grand multigravida (GM), not regular ANC, decreased gestational age and decreased fetal weight, blood transfusion and its units, all of these were risk factors for morbidity.

✚ Most of hospitals in Minia governorate suffer from the extreme shortage in the availability of blood, staff or other infrastructures. So, we recommend special efforts from the government should be put. Also, it is hoped that our results regarding PPH morbidity and mortality must be taken into consideration.

✚ Further studies targeting other regions and hospitals for more long periods are recommended to assess factors associated with maternal morbidity and mortality in patients with postpartum hemorrhage in Minia governorate.

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