# Management of primary postpartum Hemorrhage inside Erbil city: Iraq


## Abstract

**Background:** The proportions of maternal deaths due to postpartum hemorrhage vary considerably between developed and developing countries; deaths from postpartum hemorrhage are preventable. This study was carried out to determine the effect of place of birth on the risk of primary postpartum hemorrhage and the effect of mode of management of the third stage of labor on severe primary postpartum hemorrhage.

**Methods:** This is a retrospective study. Data for this study was collected from the Directorate of Health in Erbil city and record review from Maternity Teaching Hospital, Primary Health Care Labour room and Private Hospital. The population comprised all low risk women giving birth from 2012till 2014. The data entry and data analysis was done by using Statistical Package for Social Sciences (SPSS, version 21.0). P value ? 0.05 was regarded statistically significant.

**Results:** From the data of Directorate of Health in Erbil city and record review a total of 73,954 births in Maternity Teaching Hospital, primary health care center and Private Hospital and home, 32,420 (43.8%) women were at low-risk. About 1.3 percent (428/32,420) of those low-risk women experienced a blood loss greater than 1,000 mL. In this low-risk cohort of women, those women receiving active management of third stage of labor had twice the risk of blood loss greater than 1,000 mL compared with those undergoing physiological management of third stage of labor (RR: 2.12, 95% CI: 1.32-3.21).

**Conclusion:** The result of this study showed that severe primary postpartum hemorrhage was experienced by 1.32 percent of low-risk women inside Erbil city. Place of birth was not associated with increasing the risk of severe postpartum hemorrhage but active management of third stage of labour increased the risk by twofold. This study is welcoming and provides well-reasoned scientific arguments in promoting third stage labour care for women in developing countries. Further studies tackling this condition are necessary.


**Key words:** Postpartum hemorrhage, risk factors, management options, cesarean


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## Introduction

Postpartum haemorrhage (PPH) is the leading cause of maternal mortality worldwide with a prevalence rate of 6%; Africa has the highest prevalence rate of about 10.5% (1). In Africa and Asia, PPH accounts for more than 30% of all maternal deaths (2).

The proportions of maternal deaths due to PPH vary considerably between developed and developing countries, so deaths from PPH are preventable (2). Interventions to prevent PPH in developing countries are therefore very important in the global effort to achieve by 2015 the Millennium Development Goal of reducing maternal mortality ratio by three-quarters (from 1990 levels) (3).

The third stage of labour is defined as that time extending from the birth of the baby until the birth of the placenta (4).

The most common cause of PPH is uterine atony. An evidence-based intervention for the prevention of uterine atony is active management of the third stage of labour, which has been adopted lately in developing countries (5, 6). Research in this field in developing countries is rare. Therefore, both accurate knowledge about active management of the third stage of labour (7) and its correct use remain low in developing countries (8, 9).

In developing countries, health systems face difficulties that delay the delivery of emergency obstetric care, which is very important for saving the lives of women who develop PPH. The high prevalence of anemia in women in developing countries, complicates PPH. Prevention of PPH through

greater use of active management of the third stage of labour will reduce maternal mortality (10). Approximately 65% of deliveries in our region are supervised by a skilled health-care provider. Developing countries needs evidence-based interventions to reduce PPH rates in deliveries not attended by skilled providers (11).

Primary postpartum hemorrhage is often defined as a blood loss of over 500 mL during or within the first 24 hours of birth (12). The average blood loss delivery has been estimated at 500ml and this amount of blood loss is not tolerated by women in developing countries. They enter labour in poor health and they are usually hemo dynamically compromised(13).The primary method which is available for practitioners in clinical situations is visual estimation of the blood loss. It provides the bases for clinical management. This study depends on this method which usually results in underestimation of blood loss. The estimate of blood loss in the current study is assumed to be consistent in different birth settings with different management of third stage being used (14).

Two approaches to the management of the third stage of labor are used: active, which means using a uterotonic drug, or physiological, not using a uterotonic drug (15).

To our knowledge this is the first study concerning postpartum hemorrhage and its management inside Erbil city. This study was carried out to determine the effect of place of birth on the risk of primary postpartum hemorrhage and the effect of mode of management of the third stage of labor on severe primary postpartum hemorrhage.

## Methods

This is a cross sectional, retrospective study. Data for this study were collected from Directorate of Health in Erbil city and record review from Maternity Teaching Hospital, Primary Health Care Labour room and Private Hospital. The Maternity Teaching Hospital is the only public Hospital in Erbil city. It provides delivery care services, medical termination of pregnancy, Caesarean section and blood transfusion. It is largely equipped to cope with emergencies, and services are available 24 hours a day. The hospital serves the whole population of Erbil governorate.

The population comprised all low risk women giving birth from 1st Jan 2012 till 1st Jan 2014. Information collected was about demographic, medical history, type of birth, and place of birth. Exclusion criteria were: women with previous cesarean section, elective cesarean section stillbirth, previous postpartum hemorrhage(>1,000 mL), pregnancy-induced hypertension, gestational diabetes, essential hypertension, diabetes, thyroid disease, heart disease, asthma, hematological disorder, neurological disorder, renal/urinary tract disorder, multiple birth, fetal death, women who presented in labor before 36 completed weeks' gestation or after 42 completed weeks' gestation, induced labor, shoulder presentation or breech, and transverse lie. Place of birth was defined as home, primary unit, secondary hospital, or private hospital.

In active management of labour the uterotonic drug of choice is given as soon as possible after birth of the baby's anterior shoulder; then the cord is clamped and cut after birth of the baby; the placenta is born after separation by maternal effort or controlled cord traction, while in the physiological management of third stage of labour no prophylactic uterotonic drug is given, without controlled cord traction. Clamping and cutting of the cord is delayed for several minutes or until the placenta is expelled. If the cord is clamped and cut before expulsion of the placenta, the placental end is to be drained. Keeping the women warm and put the baby to the breast. When signs of placental separation occur, the mother's position may be changed to deliver the placenta by gravity force then using traction force gently to guide the placenta.

According to the records, women were categorized into four groups: active management, active management with treatment, physiological, and physiological with treatment. In the current study active management and active management with treatment were put together under the group "active management" and physiological, and physiological management with treatment were considered together under the second group named "physiological third stage." Treatment refers to the administration of uterotonic drug (16).

The study was approved by the scientific committee of the department of Community Medicine and the ethical committee of College of Medicine at Hawler Medical University.

**Data analysis:**

The data entry and data analysis was done by using Statistical Package for Social Sciences (SPSS, version 20.0). P value ? 0.05 was regarded statistically significant. Statistical tests included Chi-square test to compare between the proportions of different "characteristics" among the groups. Analysis was done with multinomial logistic regression after controlling for maternal age(< 35 or > 35years), parity (nullipara or multipara), ethnic group (Kurdish, Arab, Turkman, Aserian, others), augmentation of labor done or not, length of labor, mode of birth (vaginal, assisted vaginal, emergency cesarean section), episiotomy done or not, and newborn birth weight (less or greater than 4,000 g).

## Results

From the data of Directorate of Health in Erbil city and record review of a total of 73,954 births in Maternity Teaching Hospital, primary health care center and Private Hospital and home, 32,420 (43.8%) women were at low-risk. Of this group, 11.3 percent gave birth at home, 17.7 percent in a primary unit, 45.5 percent in a secondary-level hospital, and 25.4 percent gave birth in a private hospital.

Table 1 illustrates the mean age, parity, and length of labor, vaginal births, and management of third stage of labor by place of birth. The study shows that each group was different significantly in respect to these characteristics. Those women who gave birth at home or in primary units have a higher mean age and parity and shorter mean length of labor. The home and primary unit women showed a greater percentage of unassisted vaginal delivery with lower percentage of active management of third stage of labor than the secondary and private hospital groups.

**Table 1: Distribution of the studied sample according to mean age, mean parity, mean length of labour, vaginal birth, Cesarean section, active management of third stage of labour by place of birth**

| Place of birth | | | | | | |
|---|---|---|---|---|---|---|
| Characteristics | Home (n = 3,660) | Primary Unit (n = 5,754) | Public Hospital (n = 14,760) | Tertiary Hospital (n = 8,246) | Total (n = 32,420) | p |
| Mean age (yr) (SD) | 30.4 (5.4) | 27.9 (6.0) | 27.7 (6.0) | 29.3 (5.9) | 28.5 (6.0) | <0.005 |
| Mean parity (SD) | 1.4 (1.4) | 1.1 (1.2) | 0.9 (1.2) | 0.7 (1.0) | 1.0 (1.2) | <0.002 |
| Mean length of labor (hr)* (SD) | 5.1 (4.8) | 6.1 (4.8) | 6.39 (4.6) | 7.4 (5.3) | 6.4 (4.9) | <0.001 |
| Vaginal births | 95.4% | 94.7% | 84.5% | 72.7% | 84.6% | <0.0001 |
| Emergency cesarean sections | 2.6% | 3.2% | 8.5% | 14.9% | 8.5% | <0.002 |
| Active Management of third stage | 25.9% | 47.1% | 73.2% | 77.8% | 64.4% | <0.003 |

Table 2 shows women who lost blood greater than 1,000 mL and mode of third stage management for each place of birth. About 1.3 percent (428/32,420) of those low-risk women experienced a blood loss greater than 1,000 mL. Women who gave birth at home and in primary health care center had the lowest proportion(25.9% and 47.1%) among those who received active management of the third stage of labor, and the lowest proportion of blood loss greater than 1,000 mL (1.03% and 1.11%),while the secondary and private hospital groups had the highest proportion (73.2% and 77.8%) of women receiving active management of the third stage of labor and the highest proportion(1.30% and 1.62%) of women with a blood loss greater than 1,000 mL.

A larger number of women (1.11%) with blood loss more than 1,000 ml were in the active management groups for all birth places.

**Table 2: Distribution of severe postpartum hemorrhage cases by third stage management and birth place***

| Place of birth | | | | | |
|---|---|---|---|---|---|
| Third stage management | Home N=3,660 | Primary Health care Center N=5,754 | Public Hospital N=14,760 | Private Hospital N=8,246 | Total N=32,420 |
| | N(%) | N(%) | N(%) | N(%) | N(%) |
| Physiological | 12 | 18 | 20 | 18 | 68(0.21) |
| Active | 26 | 46 | 172 | 116 | 360(1.11) |
| Total | 38(1.03) | 64(1.11) | 192(1.30) | 134(1.62) | 428(1.32) |

Table 3 shows the relative risk of blood loss greater than 1,000 mL by place of birth. It was 0.92(95% CI: 0.59-1.73) for the home birth group, 1.07(95%CI: 0.68-1.69) for the secondary hospital group, and 1.10 (95% CI: 0.67-1.79) for the private hospital group, although the differences were not statistically significant. There was no statistically significant difference between the four groups in respect to place of birth and risk of severe postpartum hemorrhage (loss greater than 1,000 mL).

**Table 3: Distribution of studied sample according to variables and risk of severe hemorrhage**

| Variables | Crude RR | P value | Adjusted RR | P value |
|---|---|---|---|---|
| **Place of birth** | | | | |
| Home | 0.94 (0.53–1.65) | 0.83 | 0.92 (0.59–1.73) | 0.77 |
| Primary Health care center | (reference group) | | | |
| Secondary Hospital | 1.20 (0.80–1.79) | 0.38 | 1.07 (0.68–1.69) | 0.45 |
| Private Hospital | 1.47 (0.96–2.24) | 0.08 | 1.10 (0.67–1.79) | 0.23 |
| | | | | |
| Maternal age (yr) (>35 vs <35) | 1.27 (0.89–1.78) | 0.04 | 1.21 (0.79–1.93) | 0.17 |
| **Parity (nulliparous vs multiparous)** | **0.63 (0.46–0.85)** | **0.01** | **1.11 (0.65–1.56)** | **0.50** |
| Ethnicity | | | | |
| Kurdish | 0.84 (0.57–1.24) | 0.65 | 1.17 (0.65–1.72) | 0.46 |
| Arab | (reference group) | | | |
| Turkman | 1.20 (0.56–2.24) | 0.35 | 1.61(0.91–2.87) | 0.12 |
| Aserian | 1.24 (0.81–2.21) | 0.26 | 1.20 (0.59–2.08) | 0.41 |
| Others | 0.88 (0.39–1.98) | 0.76<br>0.96 | 0.96 (0.42–2.10) | 0.93 |
| **Augmentation of labor (yes vs no)** | **1.35 (1.03–1.76)** | **0.02** | **0.84 (0.51–1.16)** | **0.31** |
| | | | | |
| Mode of birth | | | | |
| Vaginal | (reference group) | | | |
| **Assisted vaginal** | **1.65 (1.12–2.68)** | **0.01** | **0.79 (0.45–1.62)** | **0.62** |
| **Emergency cesarean section** | **3.69 (2.94–4.11)** | **<0.001** | **2.98 (1.71–4.21)** | **<0.001** |
| Episiotomy (yes vs no) | 1.29 (0.84–1.99) | 0.24 | 0.98 (0.53–1.82) | 0.96 |
| **Macrosomia (>4 kg vs <4 kg)** | **1.53 (1.13–2.07)** | **0.01** | **1.40 (0.79–1.98)** | **0.04** |
| **Mode of third stage (active vs physiological)** | **2.74 (2.04–4.23)** | **<0.001** | **2.12 (1.32–3.21)** | **<0.001** |

In this low-risk cohort of women, those women receiving active management of third stage of labor had twice the risk of blood loss greater than 1,000 mL compared with those undergoing physiological management of third stage of labor (RR: 2.12, 95% CI: 1.32-3.21). In addition, women experiencing an emergency cesarean section had an almost two fold risk of blood loss greater than 1,000 mL than women who had normal vaginal birth.

## Discussion

In the current study 1.32% of women experienced severe postpartum hemorrhage, which is lower than that reported in other low-risk populations. According to WHO PPH affects approximately 2% of all women who give birth.

WHO defines postpartum hemorrhage (PPH) as a blood loss of 500 ml or more within 24 hours after birth, while severe PPH is defined as a blood loss of 1000 ml or more within the same time frame. The reporting of postpartum hemorrhage in our region uses the WHO definition which did not distinguish between high and low risk women (17).

Women who make the choice to give birth at home or in a birth centre do so because they want to give birth naturally, in their own way at their own time; this includes the way they want to experience the third stage of labour.

The study which was conducted among low risk American women (18) reported that 2.6 percent of the women had a blood loss which was greater than 1,000 mL. A randomized controlled trial in the UK(19) showed that 2 percent (90/3,436) of the women had a blood loss which was greater than 1,000 mL. The Australia Study, (20) demonstrated that 2.3 percent of the women who gave birth vaginally had a blood loss of 1,000 mL or more but which was less than 1,500 mL and that 1.6 percent had a blood loss of 1,500 mL or more. A study in India showed that, 40.3% of the women had a blood loss which was between 500-700 ml, 27.4% had a blood loss which was between 700-1000 ml and 32.2% had a blood loss of more than 1000ml (21).

A recent Swedish randomized controlled trial (22) on low-risk women which compared the physiological third stage with the active management, reported a high rate of severe postpartum hemorrhages 13.5 percent overall. The high rate of PPH in the previous studies is due to high risk cohort. The explanation for the low rate of PPH in the current study: is due to low risk women, under-reporting, or due to different skills of midwives in the different study settings and finally could be due to the use of visual method for assessment of hemorrhage which is a subjective one and results in underestimation of the amount lost especially in a busy labour room.

In the current study the lowest proportion of women who received active management was among home and primary health center groups (25% and 47% respectively).

The explanation for that could be due to the fact that birth is a normal process and no need for interference that is why those women seek care from the primary health care center and some even prefer delivery at home (23), while the hospital group had higher rate of active management even without risk of postpartum hemorrhage.

In the current study, those having active management of the third stage of labor had two times the risk of severe postpartum hemorrhage than those having a physiological third stage of labor. This finding was in contrast with the findings from randomized controlled trials that were conducted in the UK (24, 25).

One of the limitations of this study is a retrospective study so it's subjected to selection bias. The higher rate of severe postpartum hemorrhage in the active management group found in our study could be explained by under-reporting of postpartum hemorrhage in the physiological third stage group. It could also reflect the fact that the third stage of labor was already complete when it was managed. Caregivers may not be as skilled as they should be in monitoring blood loss and uterine contractility when physiological management was used. It is clear, however, that in developing countries there is no good evidence which informs decision making for women at low risk of hemorrhage, in low-resource settings and with caregivers who are not confident in active and physiological management of third stage of labor (26). The results of this study suggest that women at low risk of hemorrhage with caregivers who are confident in the physiological management of third stage of labor may have less risk of severe postpartum hemorrhage than their counterparts experiencing active management of the third stage of labor. Another limitation of this study is that the deliveries are not representative of all facility-based deliveries in Erbil governorate so the result can't be generalized. Further prospective research is needed to substantiate these results and provide stronger evidence to inform decision making.

## Conclusion

The result of this study showed that severe primary postpartum hemorrhage was experienced by 1.32 percent of low-risk women inside Erbil city. Place of birth was not associated with increasing the risk of severe postpartum hemorrhage but active management of third stage of labour increased the risk by twofold.

The finding of this study is in contrast to other studies from randomized controlled trials on this clinical issue. Blood loss in labor or the postpartum period exposes women to additional risks and also increases financial burden on the health service. It is important to support women and encourage physiological birth if it's appropriate. It should also be emphasized that the reduction of blood loss has a much greater impact on women's health in our region. A randomized controlled trial in this field is recommended. We acknowledge that this study is welcoming and provides well-reasoned scientific arguments in promoting third stage labour care for women in developing countries.

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