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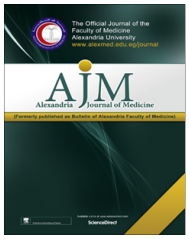

Postpartum hemorrhage is related to the hemoglobin levels at labor: Observational study

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KEYWORDS

Uterine atony;
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Abstract *Background:* Anemia in pregnancy is common and linked to postpartum hemorrhage in terms of uterine atony. The more severe the anemia, the more likely the greater blood loss and adverse outcome. The aim of this study was to examine the association between anemic women at labor and postpartum hemorrhage (PPH) during emergency cesarean delivery and to assess the hemoglobin (Hb) values at which the emergency hysterectomy is needed. *Methods and patients:* A cross-sectional study was carried out between (Aug. 1st 2012 and Jul. 30th 2013) at Al Thawra General hospital. Fifty-three cases were included in the study. *Results:* Postpartum hemorrhage was developed in 53 women (29.1%). Out of 53 women, 21 cases (39.6%) had severe uterine atony and required emergency hysterectomy and the remaining 32 cases (60.37%) responded to the conservative measures (p 0.03). Most of the hysterectomized women 80.75% (17/21) had Hb levels $\leqslant 7$ versus 12.5% of the nonhysterectomized patients [OR 29.75; 95% CI 6.564–134.53; $p < 0.01$]. There was a strong correlation between low Hb levels and blood loss [$r = -.619$; $p < 0.00$]. *Conclusion:* Our study supports the association between anemia (Hb < 10) and the risk of PPH. We also provide evidence of the association between severe anemia and emergency hysterectomy.

1. Introduction

Anemia in pregnancy is defined as hemoglobin level below 11 g/dl (WHO).[1] It is one of the public health problems mostly in developing countries.[2] World Health Organization (WHO) reported that the prevalence of anemia during pregnancy in developing countries exceeds 50%.[1] In pregnancy, anemia is mainly nutritional due to dietary deficiency of iron and folates[3] but impaired absorption, chronic blood loss, increased requirement, concurrent medical disorders and malaria are other contributing factors for anemia.[4] It has long been considered that anemia increases the risk of postpartum hemorrhage (PPH)[5] and the two conditions together contribute to 40–43% of maternal deaths in Africa and Asia.[6]

Few studies exist that have linked the risk of PPH by level of anemia and indicate a weak association.[7] Recently small studies demonstrated causal – relationship between severe anemia and uterine atony which is the main cause of PPH accounting for about 90% in most studies.[8]

Similar to other less developing countries, anemia is prevalent in our area particularly in remote setting where the accessibility to antenatal care services is difficult. It is not uncommon to see women at time of labor with uncorrected

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moderate to severe anemia. They are often unbooked and seeking hospital only when severe obstetric complications have already developed. The aim of this study was to find out the rate of PPH among women with low hemoglobin concentration (Hb < 10) during emergency cesarean delivery and to assess the Hb level at which cesarean hysterectomy is needed.

2. Patients and methods

This study was a cross-sectional observational trial conducted over a year (from August 1st 2012 to July 30th 2013) in Al Thawra General Hospital. The study included all singleton pregnant women, 38 weeks gestational age or more (based on early first trimester ultrasonography and/or LMP), who delivered by cesarean section and having moderate to severe anemia (Hb < 10 g/dl) at admission. Anemia is defined according to WHO criteria: mild (Hb 10–10.9 g/dl), moderate (Hb 7–9.9) and severe (Hb < 7).

We excluded from the study any women with risk factors for uterine atony [i.e. over distended uterus, parity ⩾ 5, history of previous PPH, bleeding tendency, etc.]. Fifty-three women met our criteria were included in this study. An informed consent was taken from each participant and the ethical approval was obtained from the hospital ethics committee. The study was conducted in accordance with the Helsinki declaration. Maternal characteristics such as age, parity, gestational age, booking status, previous scar and pregnancy complications were noted. Clinical evaluation and routine investigation including initial hemoglobin levels, urine analysis and other tests were performed as indicated.

The hospital protocol for prevention of PPH was followed which relies on the administration of 600 μg misoprostol (3 tablets) rectally at the time of scrubbing, in addition to oxytocin infusion (20 units in 500 ml normal saline solution infused over 30 min). Circumstances in which additional uterotonic agents are required, injection of methyl ergometrine (if no contraindication), increasing the oxytocin infusion doses, local injection of either or both drugs are used as appropriate. Cesarean section was performed as standard by the senior-in charge and one resident doctor, under spinal anesthesia with Pfannenstiel skin and lower uterine segment transverse incisions. The intraoperative blood loss was estimated by using the calibrated Steri-Drape TM Loban TM 2 (3M Health Care, St. Paul, Minnesota, USA) for all cases. Collected blood within the drape was added to the content of suction bottle and counted. The surgical swabs were weighed and the differences in weight between soaked and dry [1 g = 1 m] were added. All patients received prophylactic antibiotics and blood transfusion. Hysterectomy was performed by senior in charge and on-call consultant after discussion when conservative measures failed to restore uterine tonus namely bimanual uterine massage, use of additional uterotonic agents, compression sutures and uterine artery ligation.

The outcome measures were the rate of PPH in these anemic patients, the level of Hb among those women who needed hysterectomy, estimation of blood loss, amount of blood transfused the interval from delivery till completing the hysterectomy and the type of hysterectomy.

2.1. Statistical analysis

Analysis of the data was carried out using SPSS version 21. Values given are mean ± SD or percentages as appropriate. Independent sample *t*-test was used to evaluate the association between continuous variables and Chi-square test for categorical variables.

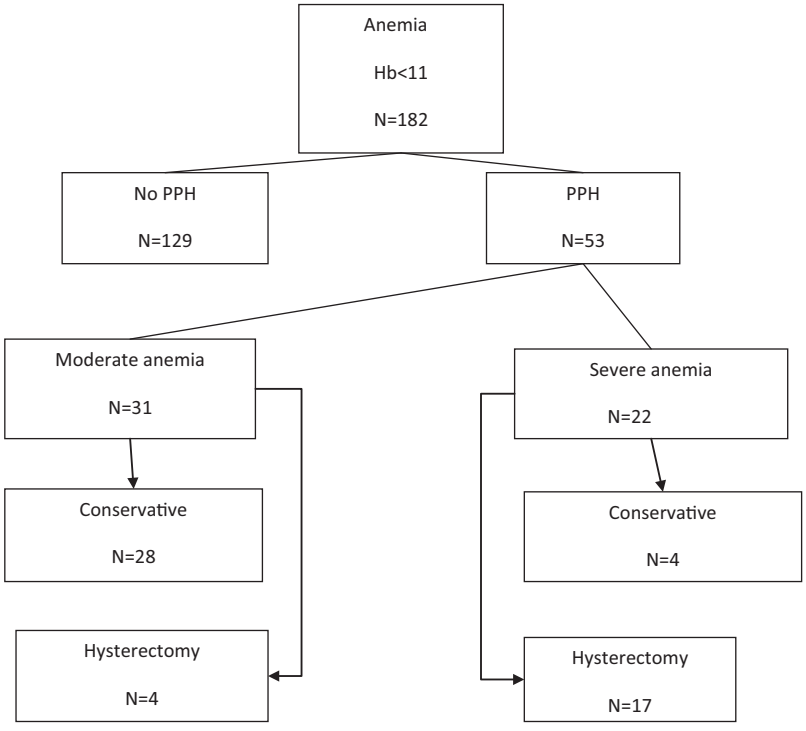

Figure 1 Flow chart.