



CHAPTER II

LITERATURE REVIEW

A. Anemia in Pregnancy

Anemia in pregnancy is a major health problem among pregnant women. Anemia in pregnancy may result from a variety of causes, the most prominent among them being a lack of chemical “building blocks” for blood cells such as iron, folic acid, and vitamin B12; hematological diseases such as thalassemia, sickle cell anemia; enzyme disorder; infection; parasites; etc.

According to hemoglobin (Hb) percentage in the blood, anemia in pregnancy is classified into two categories – moderate anemia ($7 \text{ gram\%} < \text{Hb} < 11 \text{ gram\%}$), and severe anemia ($\text{Hb} < 7 \text{ gram\%}$). Meanwhile, according to hematocrit (Hct) level in the blood anemia in pregnancy is recognized by Hct level less than 33% (WHO/SEARO, 2002). A major symptom of anemia is activity intolerance. In addition, sensory-perceptual alterations such as dizziness and light-headedness, and paleness usually occur. More than 90% of all cases of anemia in women are caused by iron deficiency. Therefore, the major intervention to reduce anemia in populations is through iron supplementation.

The major concern about anemia in pregnancy is the possible adverse effects on both the mother and the fetus. Women who are anemic during the antenatal period have poor iron reserves and a consequent diminished ability to withstand blood loss during delivery. An association between severe anemia and maternal mortality has been shown

in a large Indonesian study. The maternal mortality rate when hemoglobin was <10.0 g/dl was 70/10,000 deliveries compared with 19.7/10,000 deliveries for non-anemic women (Tam and Lao, 2002:25). The investigators believed that increased mortality reflected only a hemorrhagic condition with late hospital attendance, and did not result from an antenatal anaemic state. A negative association between anemia and duration of gestation and low birth weight has been reported by most studies. One of the largest studies to date examined more than 150,000 pregnancies. Severe anemia, defined as a Hb <8.0 g/dl, was associated with the birth of small babies as a result of both preterm delivery and growth restriction (Tam and Lao, 2002: 25-26)

A cross-sectional study titled “Iron-deficiency anemia in pregnant women in Bali, Indonesia: a profile of risk factors and epidemiology” have carried out by Ketut Suega, et al. in Bali Indonesia and published in 2002. The result showed that the factors related with anemia were length of gestation, level of education, and antenatal intake of iron pills. Therefore, preventive measures such as iron supplementation, the iron fortification of food, and health education were recommended to be encouraged.

Another study, “Assessing severe maternal anemia and its consequences”, was done by Meda.N, et.al in Burkina Faso in 1995. This study included 247 pregnant women who were diagnosed to be anemic. The result showed that severe maternal anemia and pallor of the conjunctiva were significantly associated with pre-term delivery and perinatal death, but not with low birth weight. Instead, three women died, two due to septic shock and one due to hypovolemic shock.

B. Postpartum Hemorrhage

Postpartum hemorrhage is defined as blood loss that exceeds 500 ml following vaginal childbirth or 1000 ml following Cesarean birth (Hayashi, 1992). Blood loss to this extent in the first 24 hours following childbirth is termed *early* postpartum hemorrhage and such blood loss occurring after 24 hours is called *late* postpartum hemorrhage (Gorrie, 1994).

The most commonly identified causes of postpartum hemorrhage are known as **4T** including abnormalities of uterine contraction (**T**one), retained products of conception (**T**issue), birth canal trauma (**T**rauma), and abnormalities of coagulation (**T**hrombin)(Schuursman.N, at al., 2000). Approximately 75 per cent of cases of early hemorrhage are due to uterine atony, a condition typified by a lack of muscle tone that results in failure of the uterine muscle fibers to contract firmly around myometrial blood vessels when the placenta separates (Gorrie, 1994).

Conditions that predispose women to uterine atony include a history of previous postpartum hemorrhage, high parity, fibroids, uterine anomalies, anemia, large fetus, multiple gestation, polyhydramnions, prolonged labor, precipitatus labor, excessive analgesia or general anesthesia, placenta previa, unexpelled blood clots, and mismanagement of the third stage labor (Buckley, 1990).

Maternal conditions that determine the effect of a specific blood loss include the

patient's nonpregnant blood volume, the magnitude of pregnancy-induced hypervolemia, the degree of anemia at the time of delivery, and the patient's general health status (Buckley, 1990).

Maternal outcomes depend on the cause of bleeding, the amount lost, and the treatment required to control the hemorrhage. Maternal morbidity and mortality rates rise in direct proportion to the amount of blood loss. If hemorrhage is not checked promptly, hypovolemia and shock will occur. This state may lead to renal damage, disseminated intravascular coagulation, Sheehan's syndrome, and maternal mortality. Other complications include anemia, puerperal infection, embolism, and transfusion reaction. (Buckley, 1990).

A study undertaken in India in 1992-94, showed that the maternal mortality was 572/100,000 live births. In the study, 487 maternal deaths indicate 20.6% deaths were during pregnancy, 12.6% during labor and 60.8% during puerperium. Nearly one-fifth of the women who died, delivered at home and had to be shifted to hospital because of sepsis or hemorrhage, complication of pregnancy or labor. Moreover, among the victims 64.4% were anemic (Bhatt & Hazra, 2000:1-2)

Preventive measures that can reduce the incidence of postpartum hemorrhage are screening for and treating anemia during pregnancy, ensuring that the patient is in good general health prior to labor, prompt obstetrical management during all stages of labor, avoidance of those situations that predispose the patient to postpartum hemorrhage, close monitoring of uterine tone, and use of prophylactic oxytocics after

delivery in those patients at risk for postpartum hemorrhage. Management of established postpartum hemorrhage is decided depending on the causes of each case. (Buckley, 1990).

Several trials have compared the effects of active against expectant management of the third stage of labor. Active management commonly consists of the prophylactic administration of an oxytocic agent after delivery of the baby, early clamping and cutting of the umbilical cord, then controlled cord traction to assist placental delivery. In contrast, in expectant management the cord is clamped only after pulsation have ceased, and the placenta is allowed to separate and deliver spontaneously or aided at most by maternal pushing, gravity, or nipple stimulation. The trials showed that postpartum hemorrhage was less common with active than with expectant management (THE LANCET, 1998:690-691).

From the above information, it is clear that management of the third stage of labor is a critical factor in the occurrence of postpartum hemorrhage. By the way, women who have some other predisposing factors to develop postpartum hemorrhage, can be avoided from that condition. Therefore, active management of the third stage is strongly recommended in Safemotherhood Program.

C. Relationship between anemia in pregnancy and postpartum hemorrhage

The United Nations Children's Fund (UNICEF) in "Programming for Safe Motherhood" mentions that,

“... anemia, due to inadequate intake of iron and folic acid as well as parasitic infections from malaria and hookworm, could contribute to increased risk of maternal death from hemorrhage...anemia also increases the risk of infection and morbidity/mortality associated with any major surgical intervention...” (UNICEF: 48).

Most of the literature in the field of nursing and midwifery reach the same conclusion, even though they rarely cited scientific evidences. Some conclusions have been made and they will be cited as follow:

“ The most commonly identified causes of postpartum hemorrhage include uterine atony... Conditions that predispose to uterine atony include...anemia...” (Buckley: 475).

“ The etiology and severity of anemia determines the risk to the woman and her developing fetus. Maternal morbidity is uncommon unless the hemoglobin level falls below 6 g; however, it is possible that subtle complication, such as delayed wound healing, infection, and postpartum hemorrhage, may occur with less severe reduction of hemoglobin.”(May.K.A: 486).

“ Uterine atony is the most frequent cause of early bleeding.... Risk factors for uterine atony: ...anemia...”(Bobak: 575-576).

As mentioned before, it is difficult to find scientific evidence regarding relationship between anemia in pregnancy and postpartum hemorrhage. Nevertheless, in a prospective study conducted long time ago in 1966, with a total of 2,225 women inclusively, using the definition for anemia as a Hematocrit level less than 35% and amount of blood loss more than 600 ml, it was concluded that there was no significant

difference between the anemic women and the non-anemic women in the risk of PPH (Dewar,1969:18-20).

It seems that the relationship between anemia in pregnancy and postpartum hemorrhage is still a rather controversial issue, although a lot of policies and programs are constructed based on this conclusion.