Blood Transfusion Reactions During Pregnancy

Sobia Nawaz*, Nadeem Ikram**, Sadaf Tufail*, Maliha Sada*, Shagufta Saeed Sial*
*Department of Gynae/Obs District Head Quarters Hospital and Rawalpindi Medical College, Rawalpindi;
** Department of Pathology District Head Quarters Hospital and Rawalpindi Medical College, Rawalpindi

Abstract

Background: To determine the frequency and types of blood transfusion reactions during pregnancy.

Methods: In this descriptive study 1754 consecutive pregnant women during a period of twelve months, were included. All reactions were reported to the blood bank. Frequency of blood transfusion reactions, type of transfusion reactions, morbidity, complication or mortality was noted.

Results: Out of total cases of anaemia (1754), the patients having blood transfusions were 26.6% (n=468). Out of 468 post transfusion reactions were observed in 20.9%. Transfusion reactions were categorized as hemolytic reactions in 4.9%, nonhemolytic reactions in 4.2% and febrile reactions in 11.7%. Out of 98 cases of blood transfusion reactions two cases expired due to severe hemolytic reaction.

Conclusion: Blood transfusion for the treatment of anaemia should be reserved only for hemodynamically unstable patients or any other comorbidity during pregnancy.

Key Words: Transfusion reactions, Hemolytic reactions, febrile reactions

Introduction

Pregnancy is a physiological phenomenon but needs careful antenatal care to have healthy fetomaternal outcome. Treatment of anaemia, during pregnancy, depends on the type, severity of anemia and gestation at which anemia is diagnosed. Severe (Hb <7g/dl) anemia at any gestation is managed with blood transfusion in second half of pregnancy. Obstetric haemorrhage is another indication of blood transfusion in pregnancy or labour. Obstetric hemorrhage is a common cause of maternal death, causing 24% of, or an estimated 127,000, maternal deaths annually. It has also been reported that massive (2,000 mL or more) and life-threatening obstetric hemorrhage occurs in 3–5% and 0.1% of deliveries, respectively, and blood product transfusion is required in 0.3–1%. Normal pregnancy is characterized by increased complement components in maternal circulation. Indeed, higher plasma anaphylatoxins concentrations are found during normal pregnancy compared to non-pregnant women. As part of innate immunity, complement system participates in recognition and elimination of microorganism and foreign cells and in the inflammatory response. It also constitutes a bridge between innate and adaptive immunity.

Blood transfusions sometimes cause acute transfusion reactions (ATR). The frequency of ATRs is estimated to be 0.2% to 10% and are responsible for death in approximately 1 per 250,000. Transfusion reactions may be hemolytic, nonhemolytic or febrile reactions Nonhemolytic fever reactions cause fever and chills without destruction (hemolysis) of the red blood cells. This is the most common transfusion reaction. It can occur even when the blood has been correctly matched and administered.

Hemolytic transfusion reactions (HTRs) are reactions in which donor RBCs are destroyed by antibodies in the recipient's circulation. They occur when antigen-positive donor RBCs are transfused into a patient who has preformed antibodies to that antigen. The donor RBCs may be destroyed immediately (a potentially serious reaction) or may have a shortened or even normal survival time (milder reactions). Most of the time, these reactions to the minor blood types are less serious than a mismatch of the ABO or Rh blood types. Rh blood group is a complex blood group systems. The complexity of the Rh blood group antigens begins with the highly polymorphic genes that encode them. To date, 49 Rh antigens are known. The most significant antigens are D,C,E, c, e. These antigens are involved in antigen antibody reactions on blood transfusion. An immune reaction to platelets in transfused blood results in the destruction of the transfused platelets. In rare cases, an immune reaction may take place that attacks the person's lungs causing TRALI (transfusion-related acute lung injury). This is believed to be caused by recipient's white blood cells being attacked by donor's white blood or plasma cells. This results in dyspnea and other symptoms. Most people recover fully from this type of reaction. Fluid overload is a common type of reaction.
of nonimmune reaction. Blood transfusion can be life-saving and provides great clinical benefit to many patients but it is not without risks: Errors and ‘wrong blood’ episodes (UK data from Serious Hazards of Transfusion (SHOT)) suggests an error incidence of 11.4/100,000 components transfused).

Patients and Methods

The study involved 1754 consecutive pregnant women during a period of twelve months who received blood transfusion in the Department of Obstetrics and Gynaecology, DHQ Teaching Hospital, Rawalpindi. Data was collected by a structured proforma from patients who had transfusion reaction. Demographic details of patients were taken. The symptoms on transfusion reaction were noted and categorized as haemolytic, non haemolytic and febrile reactions. Every patient who had transfusion reaction, blood sample was taken for re-cross match, Coombs’ (direct) test and urine sample was taken for methemoglobinuria. Patients were given symptomatic treatment for the reaction like antihistamine and steroids. All patients were kept in HDU (high dependency unit). All reactions were reported to the blood bank unit at DHQ Hospital. Frequency of blood transfusion reactions, type of transfusion reactions, morbidity, complication or mortality was noted.

Results

Out of total cases of anaemia (1754), the patients having blood transfusions were 26.6% (n=468). Patients having post transfusion reactions were 20.9% (n=98) while 79.05% had no transfusion reactions. Transfusion reactions were categorized as hemolytic reactions 4.9% (n=23), non hemolytic reactions 4.2% (n=20) and febrile reactions 11.7% (n=55). Among the non hemolytic reactions 60% (n=12) cases had rashes while 30% (n=6) had shortness of breath and 10% (n=2) had hypotension. Two maternal mortalities were observed due to severe haemolytic reaction (Table 1).

Discussion

Advances in the field of transfusion medicine have revolutionized modern medicine. Gynaecology and Obstetrics departments in every health care facility are one of the prime consumers of blood components. Blood is required to combat the adverse events, a possible likelihood if haemoglobin is less than the desired limits and if there are haemorrhagic incidences. Safe transfusion practices have strong impact on surgical, gynaecological and chronic patient care. On one hand maternal morbidity and even mortality depends on availability of blood and blood products and on the other hand injudicious use of blood and blood products can cause infection, allergic reaction or antibody production in the mother which can have major impact on the present or future pregnancies.

Different studies reported transfusion associated reactions ranging from 6.6% to 14.4%. In present study the frequency is higher as compared to the other studies. Though blood transfusion was given under strict monitoring on a predesigned proforma. A very high percentage of transfusion reactions can be attributed to several factors. It can be because of blood transfusion in a high risk group as the patients are pregnant. This may be attributed to some lapse at pretransfusion screening and cross matching step. Furthermore transfusion reactions were commonly observed during summer season which might be due to inadequate temperature controls for storage of donor’s blood. We observed transfusion reactions in 20.9% patients in comparison to a study at Toronto (Canada) where it was 10%. The error incidence was 11.4/100,000 components transfused in a study done in United Kingdom (SHOT study). The error incidence was 570/10,000 transfusions (10 cases out of 1754 transfusions) in our study where it was hematologically proven by positive Coombs’ test or methemoglobinuria. Two of our patients died unfortunately due to haemolytic transfusion reactions leading to acute renal failure and disseminated intravascular coagulation over a period of one year. In comparison 92 deaths have been reported to french hemovigilance system (1992-97). Over the first 11 years of reporting (1996-2007), 115 deaths reported to the United Kingdom Serious Hazards of Transfusion (SHOT) surveillance system due to transfusion reactions. In a national study no mortality was
observed which must be due to accurate compatibility, cross matching and screening facilities. Different Pakistani studies report blood transfusion reactions from 5-12%. A high rate of 20.9%, reported in present study, with two mortalities, reflects inadequacies, thereby needing serious contemplations.

**Conclusion**

1. Blood transfusion for the treatment of anaemia should be reserved only for hemodynamically unstable patients or any other co morbidity during pregnancy.
2. Blood bank providing the transfusion should have adequate cross matching and storage facilities to yield favourable results with negligible reactions.

**References**