Case Report:

A maternal "near-miss" case

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ABSTRACT

The term maternal "near-miss" refers to women who have escaped death either due to chance or due to good health care after experiencing severe life-threatening problems during pregnancy, labour or after termination of pregnancy. A "near-miss" event involving a third gravida with placenta praevia leading to severe antepartum and postpartum haemorrhage, disseminated intravascular coagulation, shock, and respiratory failure managed succesfully by team consisting of obstetricians, anaesthetists, transfusion medicine specialists and critical care experts is reported here. The aim of the report is to stress the need of patient education, importance of emergency transportation and availability of multidisciplinary team and adequate blood for transfusion at all levels of health care system.

Key words: *Near – miss, obstetric haemorrhage, Maternal morbidity, Maternal mortality*

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INTRODUCTION

With a fear of clinical audit many times we do not record and report the sequence of complications and their management. As per the World Health Organization (WHO), a maternal "near-miss" case is defined as "a woman who nearly died but survived a complication that occurred during the pregnancy, child birth or within 42 days of termination of pregnancy." Severe maternal outcomes include maternal deaths and maternal near-miss cases.[1] Waterstone's criteria of severe preeclampsia, eclampsia, haemolysis, elevated liver enzymes and low platelet count (HELLP) syndrome, severe haemorrhage, severe sepsis and uterine rupture are used to initially identify and classify "near miss" cases.[2] The WHO "near-miss" approach is intended to be used by health care workers, program managers and policy makers who are responsible for quality of maternal health care in the health system. The assessment should be made public to hasten the progress in the reduction of three-fourths of maternal mortality by 2015 - a key Millenium Development Goal.[1]

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The prevalence of severe maternal outcomes is estimated to be 7.5 cases/1000 deliveries.[1] Postpartum haemorrhage (PPH) is still the most common direct cause of maternal death in the world.[1] Most of the PPH cases might be having predisposing factors like anaemia, overdistended uterus, grand multiparity, multiple pregnancy, antepartum haemorrhage and prolonged pregnancy. But even without any predisposing factors severe haemorrhage can lead to sudden unexpected deterioration in maternal condition, which needs immediate attention, hospitalization and institution of active measures to control bleeding by medical, mechanical, invasive, non-surgical and surgical interventions.[3,4] Most cases of maternal morbidity and mortality due to PPH occur in first 24 hours following delivery (primary PPH); occurrence of PPH between 24 hours to 12 weeks is regarded as secondary PPH. Effective treatment of PPH needs simultaneous multi-disciplinary interventions. Health care provider needs to begin immediate resuscitative efforts, evaluate the cause of the haemorrhage to take help of other care providers such as obstetricians, anaesthetists and radiolo-

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gists. Avoiding delay in diagnosis and treatment will have significant impact on sequelae and chance of survival.[4]

CASE REPORT

A 28-year-old gravida 3 (G3), para 2 (P2), with one live child (L1) and a dead child (D1) with 7 months pregnancy with placenta praevia was brought to the labour room of the Government Maternity Hospital (GMH), Sri Venkateswara Medical College, Tirupati. She was married 5 years ago and was having regular menstrual cycles. She had studied upto primary school level, belonged to a low socio-economic stratum.

She developed painless heavy vaginal bleeding which started spontaneously on the preceding day when she was at her native village associated with giddiness and syncope. She was referred to a private maternity hospital which was 10 km away, and was treated there with intravenous (i.v.) fluid therapy and as she was in severe haemorrhagic shock and was referred from a private maternity hospital located 40 km away to seek medical care at the GMH, Tirupati. There was no history of breathlessness, palpitation, trauma or coitus, prior to the bout of bleeding. She had one antenatal check-up at the third month for confirmation of pregnancy and had undergone a second check-up 1 month ago for vaginal spotting at a private maternity hospital. Ultrasonography revealed placenta praevia and she was advised to avoid coitus and to take rest. She had taken one dose of Inj. tetanus toxoid in 5th month of pregnancy and was using iron and folic acid tablets irregularly.

During her first pregnancy she had undergone regular antenatal check-ups, delivered spontaneously by normal labour in a private hospital, 4 years ago. Puerperium was uneventful; she had breast-fed her child for seven months. She did not practice any form of contraception thereafter. Three years later, at the age of 25 years she conceived again. She had only two antenatal check-ups and had undergone ultrasonography during the fifth and seventh months, at a nearby health centre. At full term she went into spontaneous labour. However, in view of hand prolapse with transverse lie that was detected on vaginal examination, she was referred to GMH, Tirupati for further management. Emergency Caesarean section was carried out for obstructed labour and a still born male child (weight 3 kg) was delivered. During this episode, there was no history of PPH nor was there a need for manual removal of placenta. Mild fever and breast engorgement was treated in first week of puerperium. No blood transfusion was given at that time. She was discharged after 1 week from the hospital. She did not practice any contraceptive method later.

The present episode was her third pregnancy. On examination the patient was semiconscious and was in severe shock. Her clothes were soaked with blood. She was grossly pale. Her general condition was poor, the extremities were cold and clammy. The vital parameters were as follows: pulse 120/min and the pulse was thready; blood pressure 90/50 mm of Hg. Clinical examination of cardiovascular and respiratory system were normal. Obstetric examination revealed 30 weeks of pregnancy with a live foetus (foetal heart rate 130/min) and a relaxed uterus. Per vaginal examination was not done because of placenta praevia. As the patient was critically ill, another i.v. access was secured and haemaccel was started.

Laboratory testing revealed haemoglobin 8 g/dL, bleeding time 1' 20'' and clotting time 2' 20''. Her blood group was 'O' positive. Screening for human immunodeficiency virus and hepatitis B were non-reactive by rapid card test method. Two units of compatible whole blood was kept ready and the patient was prepared for emergency Caesarean section after obtaining a high risk consent for mother and baby. Under spinal anaesthesia, emergency lower segment Caesarean section was performed. After opening the abdomen in layers, anterior wall of uterus was found to be completely adherent to the anterior parietal peritoneum. Since peritoneal cavity could not be entered, incision was made directly on the lower part of the uterus. Liquor was clear. A preterm still born male child (weight 0.9 kg) was delivered.

Subsequently she continued to bleed on the operating table from the surgical wound site and also

continued to have vaginal bleeding. Inspite of administering i.v. oxytocin, methylergometrine and intramuscular prostaglandin F2α, the bleeding could not be controlled. Inotropic support with dopamine was also initiated. As the patient was in respiratory distress, pulse and blood pressure were not recordable, tracheal intubation was performed. Circulation was supported by administering noradrenaline and whole blood transfusion. Peritoneal cavity was opened by sharp dissection, uterus was closed in two layers. As bleeding could not be controlled, subtotal hysterectomy was performed. Dense adhesions at bladder area were released, haemostasis was secured and abdomen was closed in layers after keeping drain. But, heavy bleeding from vagina and through the drain continued. Bedside clotting profile revealed coagulation failure. Patient became conscious and coherent. Ventilatory support, inotropic drugs and blood transfusions continued. Fifteen units of whole blood, two units of fresh frozen plasma (FFP), and two units of platelet rich concentrate were administered over a period of 6 hours. After 6 units of whole blood was transfused, haemostasis was evident and the patient's general condition improved gradually. The patient herself had pulled out the endotracheal tube after 7 hours. She was semiconscious, responding to verbal stimuli. She was administered symptomatic treatment and was shifted to Sri Venkateswara Institute of Medical Sciences (SVIMS), Tirupati for further critical care and ventilatory management. In the respiratory intensive care unit (RICU) the patient was conscious, confused but was obeying verbal commands. General physical examination revealed severe pallor, sunken eyes, icterus, cold peripheral extremities and air hunger. Her pulse was 158/min, blood pressure was 80/50 mm of Hg. Cardiovascular system and respiratory system examination were normal. As she was desaturating, tracheal intubation was performed and mechanical ventilation was instituted. Four units of fresh frozen plasma (FFP) and 2 units of whole blood were transfused. Laboratory investigations were as follows: haemoglobin 5.8 g/dL total leukocyte count 8600 cells/mm^3, erythrocyte sedimentation rate 8 mm at the end of the first hour; bleeding time 4', clotting time 8', prothrombin time control: 12.1", test:16.7", random blood sugar 100 mg/dL; serum urea 39 mg/dL, serum creatinine 1.36 mg/dL, serum sodium 142 mEq/L, serum potassium 3.3 mEq/L. The patient required assisted mechanical ventilator support for 2 days in the RICU at SVIMS, Tirupati. Subsequently she was successfully weaned off the ventilator. On the fourth post-operative day she again had bleeding from the incision site. Obstetricians had reviewed the patient and FFP, platelet rich concentrate and fresh whole blood transfusions were administered. Later bleeding stopped from wound site and the patient recovered. From the 7^{th} post operatrion day patient was haemodynamically stable. Sutures were removed on 10^{th} post-operative day. Wound healed well and she was referred back to GMH on the same day. Patient was discharged on 12^{th} post-operative day on her request. She came for follow-up after 2 weeks and 6 weeks and she was doing well on follow-up.

DISCUSSION

Even though pregnancy is physiological, many complications can develop during and after delivery leading on to morbidity and mortality. Sudden un expected severe obstetric haemorrhage endangers the maternal life. Placenta praevia seen in a 0.5%-1% among hospital deliveries can cause severe haemorrhage. When inelastic placenta is attached to the lower segment, physiological development of lower segment leads to opening up of uterine placental vessels and leads to inevitable episode of bleeding even without trauma. The bleeding is augmented by the inherent inability of myometrial fibres of the lower uterine segment to contract and thereby constricting the avulsed vessels during pregnancy.

In the present case, the problem was diagnosed earlier. But as the patient failed to take precautions and developed uncontrolled severe antepartum haemorrhage at 28 - 30 weeks of pregnancy. She resided at a place that was 50 km away from a tertiary care hospital where facilities for blood and blood component therapy, expert ICU care and surgical facilities were available. Because of

improved transport facilities that have occurred in the recent past, she could somehow reach the GMH, Tirupati within 3 to 4 hours. But after effectively controlling the haemorrhage with surgery and replacement of the blood, due to lack of expert ICU availability and care at the GMH, Tirupati there was a need to transfer her to a tertiary care hospital for further management.

Whole blood has a shelf life of 35 days and 70% of transfused red cells function for at least 24 hours following transfusion.[5,6] One unit of whole blood transfusion raises the haematocrit by 3-4 volume per cent.[5,6] Fresh whole blood transfusion also replaces many coagulation factors, especially fibrinogen, and its plasma expands hypovolemia. It was recommended that plasma, platelets and red cells be given in a 1:1:1 ratio for trauma patients undergoing massive transfusions.[5] The incidence of renal failure, acute respiratory distress syndrome, pulmonary oedema, hypofibrinogenemia, admission to an ICU and maternal death were significantly decreased when whole blood transfusions were given compared to packed red cell transfusions or combinations of blood products.[6] When blood loss is massive, replacement with crystalloid solutions usually results in a relative depletion of platelets and soluble clotting factors leads to dilutional coagulopathy which is clinically indistinguishable from disseminated intravascular coagulation. When there is a need of massive transfusion of more than 5 units of blood due to acute loss, FFP is indicated in doses of 10 to 15 mL/kg.

The knowledge about "WHO near-miss approach"[1] for maternal health has to be spread to all the staff in health system i.e., medical, paramedical, non-medical and lower cadre staff both in government and in private sector to identify the problem and to help the people in need. Apart from the maternal death, maternal morbidity also should be considered for discussion, analysis and to be revealed to the future generation so that the quality of the care will be improved. All the district and tertiary maternity hospitals should have the facilities for surgery, blood bank components and ICU with sufficient trained staff to handle the life threatening complications to reduce the severe maternal outcome – a key Millenium Development Goal. The present case is a classic example of a "near-miss" maternal death. This case illustrates the importance of proper patient education, need of transportation, surgical and transfusion facilities at community health center, district and tertiary level hospitals in saving maternal lives. It also illustrates the surgical difficulties in dealing with placenta praevia in post-ceasarean pregnancy underscoring the need of senior obstetrician in such circumstances where procedures like ligation of internal iliac artery, B-Lynch stitch etc., may be necessary.

Active management of severe maternal complications by all healthcare staff apart from obstetricians improves quality of care. Data on cases with life threatening conditions being managed at the healthcare facility can be used to foster a culture of early identification of complications and better preparedness for acute morbidities even at remote and rural areas.

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