

# Safe Motherhood after Cardiopulmonary Resuscitation in a Term Pregnancy with Eclampsia: A Maternal Near Miss

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## ABSTRACT

Cardiac arrest in a term pregnancy is rare with a survival rate of 15-20% and mortality rate as high as 42%. Eclampsia, amniotic fluid embolism, haemorrhagic shock, sepsis, pulmonary thromboembolic events, and anaesthetic complications are significant causes of cardiac arrest. We report a rarest case of a young 26-year-old unbooked primigravida, 38+4 weeks gestation with eclampsia, HELLP syndrome, thrombocytopenia with sudden cardiac arrest-A Maternal Near Miss. Prompt resuscitation with obstetric, and anaesthetist specialist team, paved the journey to safe motherhood. An emergency Lower Segment Caesarean Section (LSCS) immediately after Cardiopulmonary Resuscitation (CPR) was performed. Ventilator support was continued for 72 hours. Successful CPR and immediate caesarean section paved the way to safe motherhood with discharge of healthy mother and baby on 12<sup>th</sup> post LSCS day. With increasing trends towards high-risk pregnancy and maternal near miss cases, a thorough knowledge in the management of cardiac arrest in pregnancy with advanced resuscitation skills among obstetricians, anaesthetists, and nursing staff is need of the millennium. Repeated simulation learning and mock drills in CPR in pregnancy should be advocated.

**Keywords:** Caesarean section, Cardiac arrest, Cardiopulmonary resuscitation

## CASE REPORT

A 26-year-old unbooked primigravida, at 38+4 weeks gestation was brought to the emergency labour room with a history of convulsions 48 hours back. The patient had an episode of seizure lasting one to two minutes 48 hours prior to presentation and was unconscious at the time of admission; the catheter was draining cola-colored urine with 100 cc in urobag for last 12 hours. There was no history of accidental trauma or epilepsy. The patient was unconscious; Blood Pressure (BP) and pulse were 200/110 mm Hg and 124/min. Within minutes, the patient had sudden cardiac arrest. A diagnosis of eclampsia with HELLP syndrome, thrombocytopenia with cardiac arrest in term pregnancy was made. Immediate resuscitation was started by a team of obstetricians, anaesthetists, and nursing staff. Inj Adrenaline 1 mg IV was given and repeated. CPR as per the Advanced Cardiovascular Life Support (ACLS) guidelines initiated by chest compression and bag and mask ventilation. The patient was intubated with endotracheal tube No.7 with respiration continued with AMBU bag. Four cycles of CPR had to be performed to revive the patient maintaining left uterine displacement throughout CPR. Bedside ultrasound confirmed a fetal heart rate of 70 beats per minute. Immediate caesarean section was done with complete haemostasis under all aseptic conditions in the presence of senior neonatologist. An asphyxiated male baby weighing 2,500 grams was extracted. Apgar score at one and five minutes was 6 and 7 respectively. Complete placenta with membranes was removed. The patient was shifted to ICU on ventilator SIMV-VCV mode. Baby was on IV fluids, CPAP followed by oxygen by nasal prongs for 48 hours in Neonatal Intensive Care Unit (NICU) Hb-13.7 gram%, TLC-15.6X1000/cumm, Platelet count-80,000, BT-2.30 minutes, CT-7.00 minutes, INR-1.79, Blood Urea-34 mg/dL, Serum Creatinine-2 mg/dL, SGOT-89 U/L, SGPT-100 U/L. Higher antibiotics cover with intravenous Inj piperacillin and tazobactam with Inj metronidazole eight hourly was continued for five days. Symptomatic treatment for control of hypertension was given. After 24 hours, the patient was weaned off ventilator support after the caesarean section. She was discharged on

postoperative tenth day with intact neurological function and a healthy baby with no neurological deficit.

## DISCUSSION

Though the focus to reduce maternal mortality is increasing in developing world yet the obstetrician's case preparedness to manage cardiac arrest in pregnancy is still underscored. Prompt and correct resuscitation in term pregnancy with cardiac arrest is key to pregnant woman's revival and survival as blood should reach the mother's heart at earliest thereby, increasing chances of fetal survival rate as in the present case [1]. Eclampsia in pregnancy with its catastrophic complications like HELLP syndrome is a significant cause for maternal near miss [2]. Eclampsia also forms a deadly triad with haemorrhage and sepsis as a direct cause of maternal mortality [3]. Cardiac arrest in pregnancy is rare with a survival rate of 15-20%, and mortality rates as high as 42% [1,4,5]. Various causes for cardiac arrest in pregnancy include amniotic fluid embolism, haemorrhagic shock, pulmonary thromboembolic events, sepsis as well as anaesthesia related complications. Rarer causes can be congenital heart ailments, trauma and anaphylaxis [6]. During the resuscitation, the compression rate, depth, hand placement, and minimal interruptions in compressions are the same as nonpregnant women but the compressions should be performed slightly higher in the chest as the gravid uterus causes elevation of the diaphragm [5]. During CPR, care should be taken to maintain concurrent left uterine displacement. In the present case, LSCS was performed with left lateral tilt of uterus immediately after CPR of term pregnant woman was in an emergency operation theatre. A four minute rule should be followed for performing an emergency caesarean section in pregnant women with cardiac arrest. Per Mortem Caesarean-Section should be performed at the site of arrest within four-five minutes as early delivery decreases the chances of neurological damage to the baby [5,7]. Gravid uterus causes compression of inferior vena cava resulting in reduced preload and stroke volume [8,9]. The most ideal manoeuvre of aortocaval decompression is by left uterine displacement which can be done by one hand technique

and also by two hand technique [8]. In present case, left lateral tilt of uterus was maintained through the cardiopulmonary and caesarean section until the baby was delivered.

The physiological and anatomical changes during the pregnancy compromise the functions of cardiovascular and respiratory systems thereby complicating the resuscitation [6]. There are significant changes in the airway, breathing, and circulation in pregnancy. Physiological changes in the airway include hyperemia, oedema, and hypersecretion thereby increasing mucosal friability, impaired visualisation, and bleeding. Reduced oxygen reserve during pregnancy increases the chances of desaturation and increased oxygen consumption [8,10]. Increased intrapulmonary shunting leads to poor tolerance of ventilation-perfusion mismatch. Overventilation can result in maternal respiratory alkalosis thereby leading to uterine vasoconstriction and fetal hypoxemia. There is also a requirement of lower ventilation volumes and increased chances of aspiration due to lax lower oesophageal sphincters [8,11].

Sogut O et al., reported similar case, in which a female developed ventricular fibrillation cardiac arrest but was successfully resuscitated and immediate emergency hysterotomy was done and a live baby was delivered [6].

Successful and prompt CPR with an immediate emergency caesarean section along with left uterine displacement by the team of obstetricians, anaesthesiologists and nursing staff and intervention specialists is the cornerstone for safe motherhood and delivery of healthy baby as in our case. With an increasing trend towards high-risk pregnancy and maternal near miss, a thorough knowledge in the management of cardiac arrest in pregnancy is the need for the present day.

## CONCLUSION(S)

Cardiac arrest remains the most dreaded complication in a term pregnancy as it endangers the life of the mother as well as a fetus with underscored preparedness of obstetrician for resuscitation. CPR in term pregnancy is a multispecialty teamwork of obstetricians, anaesthesiologists, neonatologists and nursing staff. Aortocaval

compression must be prevented by manual left uterine displacement concurrent to maternal cardiac resuscitation procedure with rapid sequence intubation with cricoid pressure. Immediate caesarean section should be performed if resuscitation is successful or perimortem caesarean delivery within five minutes of cardiac arrest in the event of unsuccessful CPR. A thorough knowledge of the physiology of pregnancy along with basic and advanced cardiac life support skills with a focus on cardiac arrest in pregnancy is essential. Repeated simulation learning and drills on the management of cardiac arrest in pregnancy should be advocated.

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