Obstetric Anaesthesia
Annual Scientific Meeting 2021 goes virtual
10-11 June 2021

Maternal cardiac arrest on labour ward

M Vadher, P Corson, K Von Klemperer, B Singer, M Naik
Anaesthetic Department, The Royal London Hospital, London, UK

Introduction

The incidence of maternal cardiac arrest in the UK is thought to be 2.78 per 100,000 pregnancies. It is a rare but challenging clinical scenario demanding time critical interventions by multiple teams simultaneously for optimal maternal and fetal outcomes. We describe the successful resuscitation of a maternal collapse.

Case report

A 33 -year-old primiparous woman with idiopathic dilated cardiomyopathy and a perimembranous ventricular septal defect was referred to our service at 36 weeks' gestation. Her cardiovascular magnetic resonance (CMR) showed a pre-pregnancy ejection fraction (EF) of 52%. On review she had no symptoms of decompensation and an EF of 45% on transthoracic echocardiogram (TTE). At 39 weeks she was admitted to the labour ward for induction. Shortly following induction with prostaglandin, she had a witnessed collapse. Cardiac arrest was quickly identified and Advanced Life Support (ALS) commenced. The initial rhythm was ventricular fibrillation (VF) and she was defibrillated. A perimortem caesarean section was performed in the room with delivery of a live female infant eight minutes into the resuscitation. VF persisted but following delivery, defibrillation was successful in returning spontaneous circulation.

Rapid transfer to theatre followed to facilitate management of major postpartum haemorrhage and postresuscitation care. Discussion with our local extracorporeal membrane oxygenation (ECMO) centre occurred at this point and a team was dispatched. Anaesthesia was maintained initially with ketamine, midazolam and fentanyl boluses. A TTE demonstrated an EF of 10%. Stability was achieved with surgical control of haemorrhage, uterotonics, transfusion, and infusions of adrenaline, noradrenaline and dobutamine. The ECMO team arrived 90 min following cardiac arrest and the woman was established on veno-arterial ECMO. During ECMO cannulation there was further blood loss of 1 L requiring transfusion.

She was transferred to the ECMO centre and over a period of 4 days, cardiovascular support was weaned followed by successful extubation and decannulation with no neurological deficit. An implantable cardioverter-defibrillator was inserted and she had an EF of 27% on CMR. The woman kindly visited the labour ward a few weeks later with her healthy baby girl to thank staff involved in her care. A year later with heart failure therapy her EF improved to 43%.

Discussion

We believe the positive outcomes this case were attributable to the team members solid knowledge and execution of ALS, a timely perimortem caesarean section and early discussion with the ECMO team for mechanical circulatory support, which has been associated with a reduction in mortality. As we are seeing an older obstetric population and women with complex co-morbidities including cardiac disease, an early multi-disciplinary team approach is essential. Educational packages and simulation can help ensure the team and environment are prepared to minimise delays in carrying out these lifesaving interventions.



Figure 1. Infographic demonstrating the key interventions in the successful management of maternal cardiac arrest, highlighting multidisciplinary teamwork as the key central component.

References

1. Beckett VA, Knight M, Sharpe, P. The CAPS Study: incidence, management and outcomes of cardiac arrest in pregnancy in the UK: a prospective, descriptive study. BJOG 2017; 124: 1374-81.

2. Napp LC, Kühn C, Bauersachs J. ECMO in cardiac arrest and cardiogenic shock. Herz 2017; 42: 27-44