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Postmortem Caesarean Section with a Live Baby in a Rural Hospital Setting in North-Eastern Nigeria: Case Report

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ABSTRACT

Postmortem caesarean section is a rare procedure in the practice of obstetrics, due to the associated ethical, cultural, and religious concerns. The case reported here was a 28-year-old grand multipara at about 36 weeks of gestation who presented with acute cardiopulmonary failure. A postmortem caesarean section was performed within fifteen minutes following diagnosis of maternal death, and a live foetus was delivered with a good outcome. It is possible to salvage a foetus following maternal cardiopulmonary arrest. So, obstetricians should consider a post-mortem caesarean delivery in a case of acute cardiopulmonary failure in the third trimester.

In conclusion, there is a need for Physicians in urban and rural settings to acquire these skills to enable the salvage of foetuses in mothers who have just died.

KEYWORDS

Postmortem, Cardiopulmonary arrest, Caesarean Section, Rural, Nigeria.

INTRODUCTION

The delivery of a live infant following the demise of the mother is typically a rare occurrence within the field of obstetrics.¹ The outcome for the foetus is contingent upon the underlying cause of the maternal death and the prompt response of the obstetrician responsible for the mother's care.^{1,2} Over the centuries, the outcomes of these deliveries were not encouraging. With the advent of modern medicine, the presence of well-trained health

care personnel and availability of good medical equipment, there has been some improvement in the outcome of foetuses.²

Postmortem caesarean (PMC) is delivering a child by caesarean section after the death of the mother.³ Many physicians are reluctant to perform this procedure because of the circumstances related to delivery, as well as various ethical and cultural considerations.^{2,3} In the United Kingdom, with approximately 700,000 births each

year, there is one perimortem or postmortem caesarean section for every 170,000 deliveries.² Data regarding the occurrence of postmortem caesarean sections is limited in our area, possibly due to inadequate record-keeping or a lack of conducted studies.

At the beginning of the nineteenth century, practitioners were legally obliged to carry out this operation because of the possible good foetal outcomes.^{2,4} As early as 1845, some authors reported the results of animal experiments showing that foetal movements in the womb could continue for up to 30 minutes after the mother's death.⁴ Some writers suggested that even if the mother had been dead for at least 15 minutes, it was still possible to deliver a live foetus.^{4,5} A prompt decision for caesarean delivery is critical following maternal death.^{3,4} A shorter interval between the mother's demise and delivery may enhance neonatal survival without neurological sequelae.^{1,5,6}

We present this case to highlight the role of prompt PMC in salvaging the foetus of a dead mother and the need for obstetricians to acquire this skill.

CASE REPORT

The patient managed was Mrs M.G., a 28-year-old G8P6+1 5A who was unsure of her last menstrual period, but an ultrasound done at 21 weeks of gestation estimated her to be 35 weeks 6 days on the day of her admission. She presented to our emergency unit with complaints of epigastric pains, difficulty in breathing, and elevated blood pressure of 170/110 mmHg. The pain was sudden in onset and described as stabbing and radiating to the right shoulder. She also noticed difficulty in breathing, with no associated wheezing. She was not a known hypertensive or diabetic. She had no features of DVT. She had no abdominal pains, vaginal bleeding nor drainage of amniotic fluid. She perceived foetal movements.

She booked her Antenatal Care in our facility at 21 weeks of gestation with the booking parameters within normal

limits, and she was regular on her ANC follow-up. Her last visit to ANC was 8 days before the day of her admission, with blood pressure of 120/60 mmHg, and she had no complaints.

She had no other medical history of note. She neither drank alcohol nor used tobacco. On examination, she was not pale, anicteric, with bilateral pitting pedal oedema. Her pulse rate was 92 beats per minute, blood pressure was 170/110 mmHg, and heart sounds were S1 and S2. She was dyspnoeic (respiratory rate of 30 cycles per minute) with oxygen saturation of 60% off intranasal oxygen and vesicular breath sounds on the lung fields. The abdomen was uniformly enlarged and soft. There was epigastric tenderness with no uterine contraction in 10 minutes. Symphysiofundal height was 34 centimetres, and foetal heart rate was 146 bpm. Bishop score was 4 (not favourable). Bedside urinalysis revealed ++ of protein, and bedside clotting time was 4 minutes.

A diagnosis of Severe Preeclampsia at 35 weeks of gestation was made. The diagnosis and line of management were explained to the patient and her relative. She was admitted to our emergency room. Resuscitation was immediately commenced simultaneously with clinical evaluation as reported above. She was nursed in left lateral position to prevent aortocaval compression. She was initiated on 100% intranasal oxygen at 6 litres per minute. An intravenous access was secured, blood samples were obtained for urgent packed cell volume, FBC and differentials, platelets, U/E/Cr/Uric acid, and LFT. Intravenous fluid-Ringer's Lactate 500 ml and a loading dose of Magnesium Sulphate was administered according to the Prichard regimen to prevent seizures. Urethral catheter was passed and retained it drained 200mls of urine. She was to be stabilised and planned for delivery through the fastest possible means, which was caesarean section. The Anaesthetic team, surgical scrub nurse, and the neonatologist were informed.

Table 1: THE FINDINGS OF THE INVESTIGATIONS CONDUCTED

TEST	RESULT	REFERENCE RANGE
PCV	41%	33-42%
WBC	$6.2 \times 10^9 \mu\text{L}$	$4 - 12 \times 10^9 \mu\text{L}$
Neutrophils	$6.6 \times 10^3 \mu\text{L}$	$2.0 - 8.0 \times 10^3 \mu\text{L}$
Lymphocytes	$1.4 \times 10^3 \mu\text{L}$	$1.0 - 5.0 \times 10^3 \mu\text{L}$
Monocytes	$0.9 \times 10^3 \mu\text{L}$	$0.1 - 1.0 \times 10^3 \mu\text{L}$
Platelets	$200 \times 10^9 \mu\text{L}$	$150 - 400 \times 10^9 \mu\text{L}$
Na ⁺	142 mmol/l	134 - 146 mmol/l
K ⁺	4.3 mmol/l	3.5 - 5.5 mmol/l
Urea	7.6 mmol/l	1.7 - 9.7 mmol/l
Creatinine	80 $\mu\text{mol/L}$	72 - 126 $\mu\text{mol/L}$
Uric acid	830 $\mu\text{mol/L}$	120 - 420 $\mu\text{mol/L}$
AST	80 IU	Up to 12 IU
ALT	20 IU	Up to 12 IU
Total Protein	6.0 g/dl	6.2 - 8.0g/dl
Albumin	1.8 g/dl	2.4 - 4.0 g/dl
Total Bilirubin	30 $\mu\text{mol/L}$	Up to 17 $\mu\text{mol/L}$
Conj. Bilirubin	5.2 $\mu\text{mol/L}$	Up to 4.6 $\mu\text{mol/l}$
RBS	5.5 mmol/L	4.0 - 10 mmol/L

About 30 minutes into her admission, it was noticed that the patient suddenly started gasping for air despite being on intranasal oxygen. A quick examination revealed the patient was unconscious with a Glasgow Coma Score of 5/15, not pale. There was no respiratory effort, her pulses were faint and thready, blood pressure was not recordable, and heart sounds were distant S1 and S2. Immediately, cardiopulmonary resuscitation was commenced, and the attention of the anaesthetist, scrub nurses, and the neonatologist was called. Her pulse was

checked every two minutes during the CPR. Five minutes after CPR began, there were no pulses, heart sounds, or respiratory activity. Pupils were dilated, fixed, and non-reactive to light. She was assessed and found to be clinically dead.

Approximately fifteen minutes after the mother was declared clinically dead, the doctor attempted to check the foetal heart tone. The foetal heart rate was found to be 50 beats per minute. The option of performing a

postmortem caesarean section was discussed with the husband, who was present in the maternity complex, and he provided his consent.

She had a PMC via a sub-umbilical midline incision on the anterior abdominal wall. The foetus was delivered with the following parameters: birth weight of 2kg, APGAR scores were 2,4, and 7 in the first, fifth, and tenth minutes, respectively. Husband was debriefed on the findings, and the corpse was handed to the relatives following necessary hospital protocols. The husband was supported through the grief process. The baby was admitted to our Special Care Baby Unit for observation. There were no features of birth asphyxia, and the baby tolerated breast milk substitute. The baby was discharged home two days after delivery with no complaints.

Discussion

The origin of the term "caesarean section" is still a topic of debate.^{2,7} However, the idea that it was named after Julius Caesar is mostly incorrect, as his mother, Aurelia, was alive when the emperor invaded Britain.⁷ She also buried him when he died at the age of 55.² Another theory suggests that Numa Pompilius, the King of Rome in 715 BCE, enacted a law included in the Lex Regia (the Roman legal code or law of kings) known as Lex Regis de Inferendo Mortus.⁷ This law prohibited the burial of a pregnant woman until her child had been removed from her body, even if there was little chance of the child's survival.^{5,7} This aimed to ensure that the mother and child could be buried separately.⁷ This practice later became known as postmortem caesarean section.^{5,7} When ancient Rome evolved into the Roman Empire, the Lex Regis was transformed into the Lex Caesarea under the rule of the emperors.⁷ This term eventually gave rise to what is known today as the Caesarean operation. The term "Caesarean section" became widely used in the 20th century.⁷

In the event of a sudden life-threatening occurrence in a woman during the third trimester of pregnancy or labour, the foetus is capable of adapting to withstand some level of hypoxia.⁴ It prioritises blood flow to vital organs, including the heart, brain, and adrenal glands, while limiting circulation to less critical organs.^{2,4} Maternal cardiopulmonary arrest impairs blood flow to the uteroplacental bed, causing foetal asphyxia and

progressive hypoxemia and hypercapnia, which lead to tissue oxygen deficit and metabolic acidosis.⁴ The foetus has protective mechanisms against hypoxia, including elevated foetal haemoglobin concentration and higher foetal haemoglobin saturation compared to adults.^{4,6} A foetus can survive for approximately 10 minutes during oxygen deprivation.⁴ The onset of neurologic injury after blood flow cessation in the mother occurs in approximately 6 minutes.⁷ Research indicates that neonates born up to 20 minutes after maternal cardiac arrest do not exhibit any neurological deficits in childhood.^{1,8} Capobianco et al. performed a postmortem examination on a patient who committed suicide by jumping from the window of the fourth floor of the labour ward.⁹ After 30 minutes of maternal death, a normal infant was delivered, the baby survived, and at 4 years' follow-up, he was doing well without any neurological damage.⁹ Yildirim et al. reported a case of a postmortem caesarean section that was performed after 45 minutes of maternal cardiopulmonary resuscitation on a patient with multiple penetrating injuries.⁷ This procedure resulted in the delivery of a live foetus, which was found to be completely normal six months later.² The time interval from a sudden life-threatening event in the mother to delivery is crucial for foetal survival.^{1,5} Katz et al. recommend the "four-minute rule," which states that the survival rate of neonates is significantly higher when the interval between maternal cardiac arrest and delivery is minimised.⁸ The procedure should begin within 4 minutes after maternal cardiac arrest if resuscitation efforts are unsuccessful.^{3,8} The four-minute rule was established after a review of experimental data and a case report.^{8,9} This review suggested that maternal chest compressions during cardiac arrest are not very effective in the third trimester or during labour due to the presence of the gravid uterus.^{7,9} In the third trimester, aortocaval compression on the uterus significantly reduces cardiac output. Relieving this compression through a caesarean section may improve venous return.⁹ In this situation, chest compressions may be performed more effectively.^{7,8} In summary, delivering the infant by emptying the uterus will ensure both a higher survival rate for the infant and more effective cardiac resuscitation.^{3,6}

Survival of the foetus is closely linked to gestational age.⁴ As the gestational age increases, the chances of the babies surviving improve.^{4,8} In our case, the baby likely

survived due to prompt intervention and being close to term. Maternal health and the cause of maternal cardiopulmonary arrest may influence foetal outcomes.^{1,3,10} In recent years, the primary causes of maternal death have become acute events, such as cardiac arrest, cerebrovascular accidents, hypertensive disorders, and pulmonary embolism.^{2,5} The likely cause of maternal demise in this case was pulmonary embolism or cerebrovascular accident. Generally, foetuses carried by healthy women have better reserves and are more likely to achieve better outcomes.^{8,10} Mothers with chronic illnesses may experience lower foetal survival rates after a postmortem caesarean section compared to healthy mothers.¹⁰

Despite the rarity of this condition, physicians and healthcare personnel who may potentially encounter foeto-maternal resuscitation in their practice must be familiar with the concept of postmortem caesarean section.^{4,8} It is important that all emergency departments have a protocol for dealing with this event and will preferably have trained staff who can perform this operation within an ample time.^{3,9} This procedure must be performed, and delivery of the baby within 5 minutes of cardiac arrest should be aimed at.^{8,11} Though signs of foetal life must direct the obstetrician to operate as soon as possible, regardless of the time maternal death had occurred.^{3,10}

In conclusion, although the practice of postmortem caesarean section has evolved over several generations, it remains a highly emotional and culturally sensitive issue in modern obstetrics.

Physicians in both urban and rural settings should develop the skills necessary to perform this procedure to save foetuses from mothers who have just passed away. The more often we perform this task, the more skilled we become at saving the lives of foetuses.

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