CASE REPORT

PULMONARY EMBOLISM IN A HIGH- RISK PREGNANCY: A CASE STUDY

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ABSTRACT

Management of high-risk pregnancy is challenging for the caregivers, and a healthy feto-maternal outcome is the utmost aim for antenatal care. A good pre-pregnancy screening, vigilant monitoring for obstetrical complications in pre and postnatal periods, multidisciplinary approach and timely decisions are key factors for successful management.

Keywords: *High risk pregnancy, Pregnancy, Pulmonary embolism*

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INTRODUCTION

A high-risk pregnancy is defined as a pregnancy where a woman and fetus have higher chances of adverse outcomes, as a result of pregnancy itself or because of pre-existing diseases such as diabetes, hypertension, autoimmune disorders, obesity etc[1]. Risk factors such as previous miscarriages and the existence of genetic disorders not only affect the outcome of the affected pregnancy but their chances of recurrence are very high in future pregnancies, thus affecting the physical and mental health of the woman[2].

This case study highlights the importance of individual antenatal care in high- risk pregnancy with regular and vigilant monitoring to have a healthy outcome for both mother and baby.

Case:

A female of 30 years of age, married for 9 years G5P3+1(with one alive issue) was booked at 8 weeks of pregnancy. Her Body mass index (BMI) calculated at the time of booking was 40, which fell into grade 3 obesity.

Her previous four pregnancies had complications with only one successful outcome of a baby girl in the second pregnancy. The first conception was eight years back which was complicated by polyhydramnios and intrauterine death which she delivered through caesarean section, due to failed induction. The second pregnancy was uneventful five years back, delivered through caesarean section and the outcome was a baby girl, alive and healthy. The third pregnancy two and half years back was complicated by gestational diabetes and delivered by caesarean section at 30 weeks due to preterm labor. The outcome was a baby boy, dying in the early neonatal period, on the third day. Her fourth pregnancy ended up as a first-trimester miscarriage which had a complication of excessive bleeding for which evacuation exploratory laparotomy was done with the application of Blynch suture.

CAPSULE SUMMARY

Management of high risk pregnancy requires a good pre-pregnancy screening program, vigilant monitoring for obstetrical complications in prenatal and postnatal periods, multidisciplinary approach and timely decisions to avoid any serious out come.

In this pregnancy, the patient was vigilantly monitored for any complication, especially considering her past obstetrical history for recurrence of risk factors such as diabetes, polyhydramnios and preterm delivery. At 23 weeks, on the anomalies scan, cervical length was found to be shortened for which progesterone support was given and cervical cerclage applied. Followed in the outpatient department till 35 weeks regularly and was screened for risk factors on every visit, she was admitted again for evaluation of raised blood glucose levels. During her hospital stay, Dexamethasone was given, and her blood sugar level was controlled through the American Diabetes Association-recommended diet plan and insulin on a sliding scale. A few days later during her admission, she developed lower abdominal pain, and considering her past obstetrics and present history of cerclage, her emergency cesarean section was done at 36 weeks. Intraoperative findings included a thinned-out scar, about to rupture with grade 1 meconium. The outcome of the cesarian section was a baby girl, with a good Apgar score, who was shifted to the Neonatal Intensive Care

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Unit (NICU) for observation. No other operative complications were encountered and the patient was moved to the surgical intensive care unit for monitoring. On the day of surgery, she developed shortness of breath, which was evaluated by a multidisciplinary team including a gynecologist, anesthetist and a medical specialist. A diagnosis of pulmonary embolism was suspected due to an intermediate risk score of 5(Table 1&2). Arterial blood gas analysis suggested respiratory alkalosis (pH 7.49, PO_2 132 mm Hg, PCO_2 24.6 mm Hg, Bicarbonates 20.4 mmol/l). D- Dimers were 0.7 (Normal < 0.5). Lower molecular weight heparin and oxygen inhalation were started on clinical findings. ECG, X-ray chest and Computerized tomography of pulmonary arteries (CTPA) were done, which were normal. The patient's symptoms improved and she remained stable and was discharged in healthy condition.

Table 1: Risk factors for Venous Thrombosis

Risk factors for VTE		
Pre-existing risk factors	Tick	Score
Previous VTE (except a single event related to major surgery)		4
Previous VTE provoked by major surgery		3
Known high-risk thrombophilia		3
Medical comorbidities e.g. cancer, heart failure; active systemic lupus erythematosus, inflammatory polyarthropathy or inflammatory bowel disease; nephrotic syndrome; type I diabetes mellitus with nephropathy; sickle cell disease; current intravenous drug user		3
Family history of unprovoked or estrogen-related VTE in first-degree relative		1
Known low-risk thrombophilia (no VTE)		1a
Age (> 35 years)		1
Obesity		1 or 2b
Parity ≥ 3		1
Smoker		1
Gross varicose veins		1
Obstetric risk factors		
Pre-eclampsia in current pregnancy		1
ART/IVF (antenatal only)		1
Multiple pregnancy		1
Caesarean section in labour		2
Elective caesarean section		1
Mid-cavity or rotational operative delivery		1
Prolonged labour (> 24 hours)		1
PPH (> 1 litre or transfusion)		1
Preterm birth < 37+0 weeks in current pregnancy		1
Stillbirth in current pregnancy		1
Transient risk factors		
Any surgical procedure in pregnancy or puerperium except immediate repair of the perineum, e.g. appendicectomy, postpartum sterilisation		3
Hyperemesis		3
OHSS		4
Current systemic infection (requiring intravenous antibiotics or admission to hospital)		1
Dehydration		1
TOTAL		

ART Assisted Reproductive Technology; IVF In Vitro Fertilisation; OHSS Ovarian Hyperstimulation Syndrome; VTE Venous Thromboembolism.

a. If the known low-risk thrombophilia is in a woman with a family history of VTE in a first-degree relative postpartum thromboprophylaxisshould be continued for 6 weeks.

b. BMI ≥ 30 = 1; BMI ≥ 40 = 2

Table 2: Risk assessment for venous thromboembolism (VTE)

(Adopted from Green-Top Guideline. 2015 (37a))[11]

If total score ≥ 4 risk factors antenatally, consider thromboprophylaxis from the first trimester. • If total score 3 risk factors antenatally, consider thromboprophylaxis from 28 weeks. • If total score ≥ 2 risk factors postnatally, consider thromboprophylaxis for at least 10 days. • If admitted to hospital antenatally consider thromboprophylaxis. • If readmitted to hospital within the puerperium consider thromboprophylaxis.

The patient was followed up in the obstetrical and medical outpatient department. Contraception was planned with injectable contraceptives after a discussion with the patient. Weight reduction was advised and referred to a dietician for weight reduction.

DISCUSSION

This was a high-risk pregnancy with poor outcomes in the previous four pregnancies which were complicated with polyhydramnios, diabetes, and preterm deliveries and with the added risk of three caesarean sections, had high chances of recurrence in the current pregnancy. In her current pregnancy at booking, she was classified as category 3 obesity, thus increasing the recurrence risk of the above complications.

Obesity is becoming an increasingly prevalent factor in obstetric practice, with 21.3% of the antenatal population being obese[3]. According to the MBRRACE-UK (Mothers and Babies: Reducing Risk through Audits and Confidential Enquiries across the UK) review, 30% of women who died, were obese and 22% were overweight[4]. Other studies also reported that high pre- pregnancy BMI is associated with a small but statistically significant increase in severe maternal morbidity or mortality with the highest risk in class 3 obesity having an adjusted risk of 61.1 (95% CI 44.8–78.9)[3,5.] It is highly recommended that women in pre-pregnancy should be advised for effective contraception and weight reduction to optimize the weight of the patient[3]. Obesity in pregnancy is associated with increased risk of miscarriage, diabetes, hypertensive disorders especially preeclampsia, venous thromboembolism (VTE), induced labour, dysfunctional or prolonged labour, caesarean section, anesthetic complications, postpartum hemorrhage (PPH), wound infections and mortality [6].

Pregnancy with diabetes is also associated with high morbidity and mortality especially in obese patient, with increase risk of congenital anomalies, miscarriage, polyhydramnios, hypertensive disorders, operative deliveries and postpartum bleeding[7]. Optimization of blood sugar levels have crucial role in prevention of still birth in this condition. So it's recommended to monitor blood glucose levels seven times a day. The post-prandial levels have direct relation with fetal weight gain[8].

Repeated cesarean section increases the risk of placenta previa / accreta, resulting in high rate of maternal morbidity and mortality. It is recommended to rule out this condition before proceeding for cesarean delivery[9]. Increase need of blood transfusion, adhesions between uterus and abdominal walls, wound infections and breakdown, increase chances of VTE are few the complications that are encountered with increasing number of scars on uterus[10]. Localization of placenta can be done by experienced radiologist with transvaginal ultrasound and decreases the need of expensive investigations, like MRI, to rule out accrete[9].

The incidence of VTE is 1–2 per 1000. The puerperium is the time of highest risk so it's important to repeatedly do risk scoring of every individual especially at increased risk such as, having prolonged hospital stay and obesity-related medical disorders[11]. Timely diagnosis and treatment of the patient is only way for the patient to survive this potentially fatal condition. Venous Dopplers for both legs, ECG, CXR, ventilation/perfusion (V/Q) lung scan and CTPA, are the investigations of choice [12]. Any woman with a clinical suspicion of VTE should be started on treatment with low-molecular-weight heparin (LMWH) until the diagnosis is excluded by objective testing[11]. Although X-ray chest and CTPA were negative, our patient was at high risk, with clinical and laboratory parameters suggestive of Pulmonary embolism (with an intermediate risk score of 5).

Our case study highlights the importance of timely recognition of risk factors involved with pregnancy to have a favorable outcome. It also emphasizes the need for pre-pregnancy counseling to reduce risks in future pregnancies and population awareness should be done to emphasize its importance. Risk scoring for VTE should be done in every high-risk pregnancy with initiation of prophylaxis, as soon as possible. Last but not the least, timely involvement of different specialties (multidisciplinary approach) always results in a better outcome.

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