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Case Report

MDT Management of Pregnancy with End Stage Renal Disease Case Report and Literature Review

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Abstract

Introduction: Women who are on dialysis are much less likely to become pregnant but more likely to have a complicated pregnancy compared to women with normal kidney function. This is an overview about a multi-disciplinary team approach for management of a case of pregnancy with end stage renal disease and poor obstetric history.

Case Report: This is a case of 32-year-old, gravida 2 para 1 previous caesarean section for severe pre-eclampsia at 26 weeks with poor neonatal outcome. The patient is a known case of: End stage renal disease (ESRD) on haemodialysis, type 1 diabetes mellitus, chronic hypertension, history of right atrial and superior vena cava thrombus, and history of cardiac arrest.

The patient first reported to our centre at 7 weeks of gestation and had an urgent multi-disciplinary team meeting including obstetricians, nephrologist, cardiologist, and haematologist. A clear and sophisticated plan of care addressed increasing the frequency of dialysis, close follow up in high-risk obstetrics clinic, and fetal monitoring in fetomaternal unit, and for strict glycaemic and blood pressure control.

The patient had a road traffic accident at 27 weeks of gestations, and another MDT meeting held at that time decided to plan her delivery around 30 weeks (by caesarean section) after administration of steroids for fetal lung maturity.

At 28 weeks of gestation the patient presented with reduced fatal movements. Ctg was non-reassuring and necessitated admission in labor room for Ctg monitoring, where patient started to develop features of pre-eclampsia. She was delivered by caesarean section and had a smooth post-operative period which included haemodialysis on day 2 post-operative.

Conclusion: Early multi-disciplinary meeting and scheduled plan of care for pregnant patients with end stage renal disease is crucial to achieve good maternal and fatal outcome, and to ensure better quality of life after delivery.

Keywords: *MDT Management; Stage Renal Disease; Literature Review*

Introduction

Women who are on dialysis are much less likely to become pregnant but more likely to have a complicated pregnancy compared to women with normal kidney function.

Maternal complications include miscarriage, placenta abruptio, anaemia, infection, premature preterm rupture of membranes, polyhydramnios, preterm labour, hypertension, pre-eclampsia and eclampsia, haemorrhage, need for caesarean section, and maternal death [5]. Fatal complications include intrauterine growth retardation, acute or chronic fatal distress, premature birth, new-born respiratory problems, increased stay in neonatal intensive care, and stillbirths or neonatal deaths [5,6].

Case Report

This is a case of 32 years old pregnant lady with complex obstetrics history and poor antenatal care. She is gravida 2 para 1, with history of previous caesarean section at around 26 weeks' gestation in her native country for which the indication was severe pre-eclampsia with poor neonatal outcome, baby passed away as a result of extreme prematurity.

She reported to our emergency department at 7 weeks gestation seeking urgent advice and plan of care to be referred to antenatal care for early booking, taking in consideration her previously bad obstetric history.

Patient known to have the following medical complication

1. End Stage Renal Disease (Diabetic Nephropathy) on Haemodialysis
2. since 29/10/2015 3 times/week as result of poor control of her type 1 diabetes
3. Long standing history of Diabetes Mellitus type 1 from age of 8 years: (Diabetic nephropathy and Retinopathy).
4. Known history of Hypertension most likely related to her renal condition, on methyldopa 500 mg BID treatment.
5. History of right atrial and SVC (Superior vena cava) thrombus treated with warfarin, repeated Trans Oesophageal Echo (TEE) in June /2018 no thrombus. This incidental finding was confirmed during her evaluation for kidney transplant, which resolved on her last 2 ECHO scans and stopped warfarin intake at that time
6. Her history of cardiac arrest back dated to 2017 was mainly due to hyperkalaemia during dialysis attributed to technical machine calibration error, immediately resuscitated with 4 DC shock and urgent haemodialysis.

Patient was booked in antenatal care at 8weeks gestation and was planned for urgent multidisciplinary meeting to discuss further her management plan. The meeting included the attendance of senior consultants: obstetricians, nephrologist, cardiology, haematology and maternal medicine fellow.

They had decided the following plan of care

1. Dialysis frequency will increase according to need till now 6 times weekly for 3 hours.
2. Iron and vitamin D supplements according to her results and will involve the nephrologist if there is any change will inform them.
3. Weekly CBC and serum electrolyte including urea and creatinine.
4. Close follow up at high risk obstetrics clinic.
5. Referral to Feto- maternal unit.
6. She will continue folic acid 5 mg daily and methyldopa 500 mg BID and multi vitamin 3 times weekly.
7. Start aspirin at 12 weeks.
8. From cardiac point no issue now as last 2 echo were normal and no need to give anticoagulant as that time thrombus was provoked by dialysis line.

9. Haematology advised not to give anticoagulant till now as that time thrombus was provoked by dialysis line and to do haemophilia work up.

10. Control of her diabetes with clear follow up schedule by endocrinology team.

Patient was strictly advised to have a regular follow up in outpatient clinic every 2 weeks up till 22 weeks' gestation then on weekly basis from 24 weeks gestation. Her provisional delivery date is to be discussed on future MDT meeting.

Patient fetal growth monitoring was pursued concomitantly at the fatal maternal unit (FMU). And was following with nephrology for her dialysis and endocrinology for control of her blood sugars.

The challenge faced during her antenatal care, were poor control of her blood sugar level with frequently encountered episodes of hypoglycaemia attacks with intermittent episodes of hyperglycaemia which demanded the usage of freestyle liber(continuous glucose monitoring system).

Unfortunately, her antenatal care has been complicated further by a road traffic accident at 27 weeks 'gestation this has resulted in admission over 24 hours with close monitoring.

The subsequent MDT meeting was urgently held at 27+5 weeks gestation to planherfuture antenatal care and delivery date.

The mode of delivery was discussed in length as the debate was to either consider induction of labour versus an elective caesarean section at 30 weeks 'gestation, taking into consideration her previous poor obstetrics outcome (IUFDrelated to multifactorial complication). The ultimate decision was to proceed with her admission at 29 weeks gestation for steroid intake and monitor closely blood sugar level to reduce the steroid impact by utilization of insulin administration as per sliding protocol. Her subsequent MDT meeting will involve the neonatology team.

Patient reported out of hours to Accident and emergency department at 28 weeks gestations and 4 days with complaints of decreased fatal movement for the past 24 hours. Her initial CTG monitoring in accident and emergency was not reassuring: reduced variability with minimal accelerations, the advice given by the consultant covering A and E to admit her for Urgent Ultrasound scan in ED whichshowed polyhydramnios with normal umbilical artery Dopplers.

She was reassured further with recommended admission tolabour room for close continuous CTG monitoring over the next few hours. If CTG remainsnon reassuring, to proceed with caesarean section after review.

MDT was held in labour room in the presence of Obstetrics consultant, paediatrician, anaesthesia, and plan was to give patient betamethasone for fetal lung maturity and if feasible to delay delivery till morning however if any concerns arise with CTG pattern she'll be for emergency caesarean section.

Patient was not started on prophylactic anti-coagulation after the road traffic accident as she had haemodialysis session 2 hours before the accident and received unfractionated heparin.

During the process of monitoring in labour room, patientBP noticed to rise to 160/95 mm Hg and began to be symptomatic c/o headache and mild blurryvision. She was started on IV labetalol treatment as per pre-eclampsia protocol to control her blood pressure and the team proceeded for emergency caesarean section as her CTG remained non reassuring with shallow declarations noticed.

Her Caesarean section was performed smoothly, with no intra-operative complications. Alive baby boy was delivered weighed 1.25kg, APGAR score 6 and 8 at one and five minutes respectively. Baby was admitted to NICU for close monitoring due to prematurity.

Patient was shifted to high dependency unit (HDU) then shiftedon the 2nd post-operativeday to Hamad medical corporation haemodialysis centre to continue her plan of care with close monitoring in the next 24 to 48 hours inHDU.

Patient condition settled gradually with improvement in her symptoms which made it safe for her to be transferred to the regular postnatal ward onher 4th post-operativeday. She was planned for follow up by endocrinology and nephrology clinic team on regular basis upon her discharge and review further at gynaecology clinic.

During her postnatal visit patient was investigated for anti-phospholipid syndrome and acquired thrombophilia, and both were ruled out.

Discussion

Cases review did show that there is a decline in fertility with changes in menstruation pattern which are the principal factors affecting conception in ESRD. This in turn leads to amenorrhea and anovulatorycycles. [1-3] The first successful pregnancy in a woman with chronic haemodialysis was reported by Confortini., *et al.* in 1971 [4].

In the largest study to date, the Registry for Pregnancy in Dialysis Patients reported a significant correlation between hours spent on dialysis therapy and improved fetal outcome [5]. The increase in dialysis time seems to improve the pregnancy outcome and offer several advantages: It ensures less uremic environment to the fetus and allows the mother more liberal diet (Potassium and protein), it may help to control hypertension and fluid intake and may also reduce the amplitude of blood volume and electrolyte shifts [5]. Increasing the dialysis dose i.e., fractional clearance of urea, which is commonly expressed as Kt/V [6] prolongs gestation, resulting in a higher infant birth weight and thus an infant with better chance of survival [7], which happened in our case also, as she was on dialysis twice a week before pregnancy and it was increased to every other day as soon as she was known to be pregnant.

Hypertension is the most frequently reported maternal complication in this population, occurring in 42 -80% of these women [8] Antihypertensive medications are often required to maintain maternal diastolic blood pressure in the 80 - 90 mmHg range [9] The mainstays of treatment are methyldopa, B-blockers, and hydralazine. In cases of severe hypertension, clonidine and calcium channel blockers have been used safely [8] In our case, control of hypertension during pregnancy was not an issue as patient was compliant on medicine and was responding well to it. However, when patient started contracting blood pressure went high and she had to be started on intravenous labetalol to control it.

The global prevalence of diabetes among adults over 18 years of age has risen from 4.7% in 1980 to 8.5% in 2014. In 2016, diabetes was the direct cause of 1.6 million deaths and in 2012 high blood glucose was the cause of another 2.2 million deaths. Over time, diabetes can damage the heart, blood vessels, eyes, kidneys, and nerves [10]. Diabetes is among the leading causes of kidney failure [11]. Before the implementation of insulin therapy, infertility was the most common consequence of diabetes mellitus on reproductive-age women, and when pregnancy did occur, fetal and neonatal mortality was as high as 60%. [12] Our patient had end stage renal disease due to diabetes type I, she was using freestyleliber glucose monitoring system, and controlling blood sugar was a challenge in her case due to frequent episodes of hypoglycaemia. According to study was done including Seventy-four participants, with type 1 (T1D, n = 24), type 2 (T2D, n = 11), or gestational (n = 39) diabetes, were enrolled across 13 sites (9 in United Kingdom, 4 in Austria). Average gestation was 26.6 ± 6.8 weeks (mean ± standard deviation), age was 30.5 ± 5.1 years, diabetes duration was 13.1 ± 7.3 years for T1D and 3.2 ± 2.5 years for T2D, and 49/74 (66.2%) used insulin to manage their diabetes. Sensors were worn for up to 14 days. Sensor glucose values (masked) were compared with capillary SMBG values (made at least 4 times/day). 81 patient (DM type 1, DM type 2, GDM) were using the Free Style Libre™ Flash Glucose Monitoring System. The aim of this study was to determine accuracy (compared to self-monitoring of blood glucose [SMBG]), clinical safety, and acceptability of the Free Style Libre System when used at home by that population resulting with conclusion that good agreement was demonstrated between the Free Style Libre System and SMBG. Accuracy of the system was unaffected by patient characteristics, indicating that the system is safe and accurate to use by pregnant women with diabetes [13].

Maternal mortality is very low and rarely reported [5,7]. Caesarean section delivery is common among women on dialysis and is most often prompted by premature rupture of membranes [14].

Conclusion

This challenging case did have a preterm delivery with good maternal and fatal outcome, attributed mainly to the robust plan of care and a multi-disciplinary team approach in her management from the beginning of her pregnancy including nephrology, endocrinology, and haematology expertise opinion with scheduled care process and review throughout her pregnancy progress that emphasised mainly to control her blood pressure symptoms, blood sugar levels and kidney function tests on regular basis to prevent adverse outcomes. Moreover, her postnatal follow up and contraception were discussed in details to secure best future outcome and quality of life.

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