Case Report

High-risk dialysis: pregnancy in a patient with extended Stanford-B-aneurysm of the aorta and end-stage renal disease

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Introduction

Pregnancy in women with end-stage renal disease (ESRD) undergoing dialysis treatment is uncommon but increasingly observed over the last few years [1]. The outcome in pregnancies in dialysed women is greatly influenced by maternal risk factors. During gestation, various risks may appear including the mother’s fluid overload, hypertension, anaemia and an increased risk for fetal and perinatal complications such as neonatal mortality, prematurity and small-for-gestational-age [2,3]. Here, we report on a 40-year-old female patient who developed ESRD due to an extended Stanford-B-aneurysm of the aorta 1 year prior to conception. Nonetheless, the child was delivered successfully by caesarian section after 31 weeks of gestation.

Case

A 39-year-old female was referred to our centre with a hypertensive crisis, dizziness, acute pain in the right leg and new onset anuria. Her blood pressure on admission was 220/100 mmHg. The acute pain in the right leg obviously was of ischaemic origin.

The medical history of the patient was characterized by severe idiopathic hypertension for 10 years that had not been treated thus far. Computer tomographic (CT) and angiographic diagnostics revealed a spontaneous extended Stanford-B-aneurysm of the aorta. The dissection started distal to the origin of the left subclavian artery, according to a Stanford type B dissection (Figure 1A). Compression of the true lumen by the large false lumen led to malperfusion of the right iliac artery resulting in ischaemia of the right leg as well as infarction of the right kidney (Figure 1B). Since the patient refused surgical aneurysm treatment due to life-threatening risk, a catheter-based radiological fenestration of the dissection membrane was performed. After fenestration of the dissection membrane and decompression of the false lumen, the angiogram showed an effective reperfusion of the right iliac artery. However, the patient developed ESRD since the left kidney was atrophic and the right one lost its function. As a consequence, the patient joined our chronic haemodialysis programme. Dialysis was performed for 15 h a week with a constant blood flow of 250 ml/min.

One year later, pregnancy was diagnosed, during a routine ultrasound, at the 14th week of gestation. Thereafter, renal replacement therapy was performed as haemodiafiltration and intensified to six sessions per week comprising 27 h treatment with a continuous blood flow of 250 ml/min and a post-dilution substitution volume of 75 ml/min. Haemoglobin levels were maintained between 10.0 and 11.5 g/dl by intravenous epoetin treatment with 12 000 IU weekly. Nonetheless, some additional blood transfusions were required during the last 6 weeks prior to delivery. With regard to the aneurysm and the risk of haemodynamic instability, heart rate and blood pressure were monitored closely during the treatment sessions. Frequently tested blood glucose levels were always in the normal range and gestational diabetes could be ruled out. Furthermore, dosing of magnesium and water-soluble vitamins was increased appropriately.

Amniocentesis showed a normal fetal evolution. After the 21st week of pregnancy, the patient had weekly obstetric follow-ups including ultrasound and cardiotocogram. Despite the occurrence of a polyhydramnios, all Doppler wave velocimetry showed a normal perfusion of both uterine arteries without evidence of malperfusion of the uterus.
Due to increasing blood pressure, oral dihydralazine therapy had to be initiated in the 29th week with primarily good results. Although there were no clinical signs of pre-eclampsia or HELLP syndrome, the patient underwent a prophylactic caesarean section at the 31th week due to labile hypertension.

A female baby weighing 1900 g with an Apgar Score of 5/8/10 was delivered and, due to its prematurity, transferred to the neonatal intensive care unit (ICU). After delivery, the mother was monitored on the ICU for 36 h and discharged 1 week later.

**Discussion**

Here we describe the case of a 40-year-old female patient who developed ESRD due to abdominal and renal malperfusion as a consequence of a spontaneous extended Stanford-B-aneurysm of the aorta. Despite these anatomical problems and ESRD, the patient became pregnant 1 year later and the neonate was delivered successfully by caesarian section after 31 weeks of gestation.

In line with current concepts, the dialysis treatment was intensified after diagnosis of pregnancy since a better outcome of pregnancies in haemodialysis patients, a longer gestational period and a higher birth weight are strongly associated with: adequacy of dialysis; control of hypertension with haemodynamic stability; correction of anaemia; and sufficient nutrition, as discussed in detail elsewhere [4–7].

Spontaneous dissection of the aorta is a rare entity [8,9]. Our patient had had a history of severe and untreated hypertension which is in line with most described cases. However, there were no further established predictors such as thoracic pain, stroke or abnormal anatomy [8]. In contrast, she had a history of heavy and ongoing smoking, which may have adversely affected the clinical course, since ongoing smoking may alter endothelial and vascular properties.

Treatment strategies for aortic aneurysms should comprise reperfusion attempts either by surgical procedures or by catheter-based radiological interventions, which may be less invasive [8]. Furthermore, a strict blood pressure control should be maintained to avoid spontaneous rupture of the aneurysm. Due to the aneurysm’s blood flow of our patient, a special device to measure blood pressure on the left ankle was required to gain reliable data. Intradialytic blood pressure controls revealed a mean arterial pressure of 107±4 mmHg, which remained stable over the time course. Conversely, we avoided hypotensive episodes which could be potentially harmful for the fetus.

Obstetric monitoring of the patient included Doppler wave velocimetry and ultrasound examinations, so that a malperfusion of the uterine arteries could be excluded. An amniocentesis in the second trimester showed a normal result. Like many other pregnant haemodialysis patients who usually have an increased incidence of polyhydramnios compared with the general population, our patient also developed a polyhydramnios. However, fetal development was almost normal so that the child weighed 1900 g at delivery. As described elsewhere [4–7], intensification of the dialysis dose may have led to a more appropriate gestational period and a good birth weight. Although our patient did not exhibit any clinical signs of pre-eclampsia or HELLP syndrome, she underwent a prophylactic caesarean section at the 31th week due to the onset of labile hypertension.

Taken together, we hypothesize that in our patient the conditions for a conception and a successful pregnancy were enabled by the recovery of blood flow to the uterus after catheter-based fenestration of the aneurysm’s dissection membrane. Furthermore, this report illustrates that even a pregnancy with severe vascular complications, such as an extended aneurysm of the aorta, permits a successful outcome. However, it has to be taken into account that pregnancies in
women on haemodialysis still remain high-risk pregnancies. Thus, the outcome strongly depends on the optimal dialysis strategy and the co-operation between nephrologists, obstetrics and neonatal medicine.

Conflict of interest statement. None declared.

References


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