Case Report

Three successive pregnancies in a patient on haemodialysis

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Introduction

After the first full-term pregnancy and successful delivery in a patient on chronic haemodialysis in 1971 [1], the EDTA reported that 0.9% of the 13000 women of childbearing age became pregnant after commencing renal replacement therapy and only 23% of pregnancies that were not electively terminated resulted in surviving infants [2]. A survey of the American Dialysis units over a 2-year period found that 37% of pregnancies resulted in surviving infants; pregnancies that took place after 1990 had a 52% success rate, possibly related to better management [3]. In these reports however, nothing has been mentioned about repeated pregnancies. In a report from Saudi Arabia, 7.3% of women under 50 years of age became pregnant while on dialysis wherein, a mention of more than one pregnancy has been made without giving the details of these pregnancies or their complications [4].

To the best of our knowledge no case of end-stage renal failure on dialysis with three pregnancies has been reported in the literature. We present here a patient with end-stage renal failure on haemodialysis with three successive pregnancies, the last one complicated by antepartum haemorrhage and subsequent dehiscence of the hysterotomy wound.

Case report

A 33-year-old Saudi female was started on haemodialysis in December 1991 for end-stage renal failure following chronic pyelonephritis. In October 1993 she started gaining weight and attempts at increasing ultrafiltration during dialysis resulted in hypotension. On questioning, she admitted amenorrhoea for 3 months, the last date of menstruation being July 24, 1993. Pregnancy was confirmed by a positive blood test and ultrasonography showing a viable foetus of 14 weeks. In the past she had one abortion and four live births, the last one was only two months before commencing haemodialysis.

She was on erythropoietin 50 u/kg twice a week. Pre-erythropoietin haemoglobin was 9.2 g/dl which decreased to 7.8 g/dl in November 1993. By a stepwise increase in erythropoietin to 150 u/kg three times per week with oral iron and vitamin supplements, haemoglobin increased to 9.0 g/l (Table 1). Pre-pregnancy blood pressure was controlled on hydralazine 25 mg three times daily. During pregnancy, to control hypertension, hydralazine was increased to 50 mg three times daily. The patient was advised a high calorie diet with the help of the dietician.

The pregnancy continued without any major problems. On January 6, 1994 was suggestive of polyhydramnios. The pregnancy continued without any major problems. On April 6, 1994, at 36 weeks she had spontaneous vaginal delivery of a male baby weighing 1605 g with length of 40 cm (the average weight of her previous four babies was 2300 g). Apgar score was 4 at 1 min and 9 at 5 min.

Second pregnancy

After the first delivery the patient continued on haemodialysis three times per week. In January 1995, as in the first pregnancy the patient started gaining weight. Blood test for pregnancy was positive and ultrasonic examination on February 4, 1995 confirmed pregnancy with a viable foetus of 19 weeks. The course of management during haemodialysis was same as in the first pregnancy on haemodialysis.
After completing 27 weeks of pregnancy on April 2, 1995, she went into premature labour and had spontaneous vaginal delivery of a female baby weighing 690 g. The baby died in Neonatal Intensive Care Unit within 48 h of birth due to respiratory distress.

**Third pregnancy**

Following delivery the patient continued on regular maintenance haemodialysis three times per week. In May 1996 haemoglobin decreased to 8.0 g/l (Table 1). An ultrasound scan on June 4, 1996 showed a single viable foetus of 18 weeks gestational age. Dialysis frequency and erythropoietin were increased as in the previous two pregnancies. Obstetric evaluation was suggestive of placenta previa. Hysterotomy by classical Cesarean section was performed for antepartum haemorrhage on July 8, 1996 (at 23 weeks of gestation) and a male baby weighing 550 g was delivered. The baby died in the Neonatal Intensive Care Unit after 1 h due to severe respiratory distress.

Following hysterotomy the patient developed abdominal pain, tenderness, shifting dullness and fever suggestive of peritonitis. Peripheral culture showed a white cell count of 30 000/µl with differential count of 87% polymorphonuclear cells and 20% bands. Blood culture was negative. Treatment with gentamicin, ceftriaxone and metronidazol was started but the patient’s general condition deteriorated with increase in abdominal tenderness and distension. Ultrasound scan was suggestive of very large haematoma around the surgical scar and in the broad ligament. On July 14, 1996, laparotomy was performed; haematoma between the omentum and abdominal wall was found, the uterus had vesicle and cyst formation with foul smell. The hysterotomy wound was gapping. Hysterectomy was performed and the histopathology examination confirmed infarction of uterus.

The patient recovered and continues on maintenance haemodialysis.

**Discussion**

In women of childbearing age on dialysis, due to irregularity of menstruation, the diagnosis of pregnancy is often delayed, the mean time of diagnosis being 16.5 weeks [1]. In the present case, all three pregnancies were diagnosed late with a mean age of 16 weeks of gestation. Ultrasound scan was used to confirm and date the pregnancy as has been suggested [5].

For a successful outcome attention must be paid to dialysis strategy, problems of anaemia, fluid balance, blood pressure control, and provision of good nutrition [6]. In the present case hypertension requiring an increased dose of antihypertensive medication and anaemia occurred in all the three pregnancies. The second pregnancy ended in premature delivery. The main complications of the third pregnancy were antepartum haemorrhage due to placenta previa and rupture of uterus following dehiscence of the hysterotomy wound. Only the first pregnancy was full term and successful, indicating that a good outcome in one pregnancy does not necessarily predict a good outcome in subsequent pregnancies.

Reduction in haemoglobin concentration was a feature of all three pregnancies in the present case (Table 1) which responded to increased doses of erythropoietin, iron, and vitamin supplement. Unexplained reduction in haemoglobin has been suggested as one of the signs of pregnancy in erythropoietin-treated haemodialysis patients [7] and an increased dose of erythropoietin may be required to maintain the higher haemoglobin concentration [8] which was observed in our patient in all three pregnancies. Treatment with erythropoietin has been shown to improve sexual function and to induce regular menstruation in a large proportion of women of childbearing age on haemodialysis, perhaps due to a reduction in prolactin levels [9]. Use of erythropoietin could be an important contributory factor for the increased fertility of the present case.

**Table 1. Laboratory investigations and erythropoietin dose in the three pregnancies**

<table>
<thead>
<tr>
<th></th>
<th>Hb (g/dl)</th>
<th>Retic c/o (%)</th>
<th>Serum ferritin (N = 10–111 ng/l)</th>
<th>Serum transferrin (N = 2.0–4.0 g/dl)</th>
<th>Serum iron (N = 7.0–24 µmol/l)</th>
<th>Epo u/kg/week</th>
</tr>
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<tbody>
<tr>
<td><strong>First pregnancy</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>9.2</td>
<td>0.6</td>
<td>32</td>
<td>2.6</td>
<td>9.4</td>
<td>100</td>
</tr>
<tr>
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<td>8.4</td>
<td>0.6</td>
<td>42</td>
<td>1.6</td>
<td>7.7</td>
<td>200</td>
</tr>
<tr>
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<td>7.8</td>
<td>2.7</td>
<td>28.7</td>
<td>3.2</td>
<td>12.0</td>
<td>375</td>
</tr>
<tr>
<td>3rd Trim.</td>
<td>9.0</td>
<td>1.8</td>
<td>32.1</td>
<td>3.8</td>
<td>17.0</td>
<td>450</td>
</tr>
<tr>
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<td></td>
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<tr>
<td>Pre</td>
<td>9.1</td>
<td>1.0</td>
<td>29</td>
<td>2.0</td>
<td>19.0</td>
<td>375</td>
</tr>
<tr>
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<td>2.0</td>
<td>39</td>
<td>2.0</td>
<td>14.5</td>
<td>450</td>
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<td>1.3</td>
<td>25</td>
<td>–</td>
<td>7.1</td>
<td>525</td>
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<td>1.3</td>
<td>106</td>
<td>2.5</td>
<td>52.0</td>
<td>800</td>
</tr>
<tr>
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<td></td>
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<tr>
<td>Pre</td>
<td>8.2</td>
<td>1.1</td>
<td>134</td>
<td>1.1</td>
<td>12.0</td>
<td>450</td>
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<tr>
<td>1st Trim.</td>
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<td>127</td>
<td>1.6</td>
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<td>450</td>
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<tr>
<td>2nd Trim.</td>
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<td>1.8</td>
<td>128</td>
<td>1.9</td>
<td>13.5</td>
<td>800</td>
</tr>
</tbody>
</table>

Hb, haemoglobin; Retic, reticulate count (%); S, serum; N, normal; Epo, erythropoietin; Pre, pre-pregnancy; Trim, trimester.
Though the level of blood pressure increased in all the three pregnancies it could be easily controlled with an increased dose of antihypertensive medication. However, abrupt increase in blood pressure can occur [10].

In a survey of frequency and outcome of pregnancy in 1281 women between 18–44 years of age on dialysis the various complications of pregnancy reported were two episodes of malignant hypertension (both in the postpartum period), two haemorrhagic complications, one postpartum haemorrhage, one intraperitoneal haemorrhage and one episode each of disseminated intravascular coagulation, respiratory failure, diabetic ketoacidosis, and sudden infant death [3]. Prematurity is a major problem in dialysis patients [10]. Though the first delivery in the present case was full term, the second and third were pre-mature. Increased frequency of dialysis has been recommended for favourable outcome of pregnancy [5]. In the present case, the diagnosis of the second and third pregnancies was delayed and so was increased frequency of dialysis. In this way, uraemia might have been a contributory factor in the onset of premature labour as has been suggested by some authors [11].

Wound dehiscence has been related to factors such as protein deficiency, anaemia, vitamin C deficiency and wound infection [12]. The serious complication of rupture of uterus following wound dehiscence in the present case could be multifactorial. The patient continued to be febrile after hysterotomy with leukocytosis and raised band cells suggestive of sepsis though blood culture was negative. Thus, infection of the hysterotomy wound could be an important factor for dehiscence. Anaemia as an added factor was a result of chronic renal failure. Vitamin C is a dialysable vitamin and in the last 6 months before pregnancy the patient was not on vitamin C replacement; however, deficiency of vitamin C was not confirmed by blood levels. Haematoma formation as found on laparotomy in the incision wound is a frequent cause of poor healing and an excellent nidus for infection, and is therefore frequently associated with wound disruption [12].

Multiparity is a predisposing factor for rupture of the uterus [13]. Considering the factors which can lead to such a complication in a uraemic we firmly believe that repeated pregnancies should be avoided in uraemic women on dialysis.

The present case had a delivery only 2 months before commencing maintenance haemodialysis, so the history of pregnancy in a woman with renal insufficiency (though not on dialysis) maybe a predictor of pregnancy while on dialysis. A close co-operation is needed between the obstetrician and the nephrologist in the management of a pregnant woman on haemodialysis. Pregnancy in women on dialysis is rare and so routine contraceptive counselling is not needed. If a patient on dialysis becomes pregnant she is likely to become pregnant again and repeated pregnancies may result in catastrophic complications. Therefore, proper counselling and contraceptive measures need to be adopted in those who have become pregnant once while on dialysis.

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References


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