

Repeated Pregnancy with Delivery of Full Term Baby in a Dialysis Woman: Case Report and Review of Literature

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Abstract

Pregnancy is a rare event in a woman on maintenance dialysis. We report a case of 40 year old patient on hemodialysis who had 2 uncomplicated pregnancy 6 years apart with delivery of full term healthy babies. The fertility and conception in patients with renal failure is reviewed. The reported pregnancies and their outcome from different countries in patients on dialysis showed that majority result in abortion, still birth or preterm babies. The care of a pregnant dialysis patient should involve increased dialysis hours and special care to dialysis bath and heparin use. The care should involve team work of nephrologists, obstetricians, and nutritionists and well trained nursing staff.

Keywords: Dialysis; Pregnancy; Renal failure; Kuwait

Case Report

Mrs. K. H. T. is a 40 year old Saudi patient who has end stage renal disease secondary to focal segmental glomerulosclerosis. She started maintenance haemodialysis with 4 hours sessions thrice weekly in March 2005. She was not diabetic but had hypertension which was well controlled with Lisinopril 5 mg/day. She had positive pregnancy test in November 2005 and pelvic ultrasound showed viable gestational sac at 5 weeks. Her antihypertensive was changed to methyl dopa at 250 mg twice / day. Her systolic blood pressure ranges from 110 to 120 mmHg while diastolic pressure was 70 to 80 mmHg. As the patient started her second trimester, her dialysis prescription was adjusted to 3 hour session at 5 times per week to decrease fluid removal so decreased risk and avoid hypotension. Her serum urea was 7 to 9 mmol/l and serum creatinine 150 to 200 µmol/l. This high dose dialysis also kept her dialysis efficiency high [Kt/v from 1.5 – 1.7, recommended Kt/v > 1.2] and allowed the patient to eat high protein diet to meet the metabolic demands of pregnancy.

Hemodialysis was performed with a loading dose of 1000 units of heparin but no additional hourly doses to avoid any possible bleeding. Her dialysis bath was low calcium [1.5 mmol/l] and normal bicarbonate [35 meq/l]. Calcitriol was held in order to avoid hypercalcemia. She received erythropoietin [Darboepoietin 40 mcg once weekly], folic acid and iron supplementation to keep haemoglobin level 11 - 12 gm/l. Her renal functions, serum calcium and haemoglobin were checked weekly. Transferrin saturation percentage [TSAT%] and iron stores were done monthly.

Pregnancy was uneventful. She had well controlled hypertension and did not have edema at any stage. Her fetal growth matched that of gestational age and the amount of amniotic fluid was adequate. There were no fetal abnormalities. She delivered a healthy full term girl [weight 3.0 kg] in July 2006 at 38 weeks of gestation. She became pregnant for the second time, while on dialysis, 5 years later in 2011 and the same steps were performed with delivery of full term boy at 38

weeks of gestation [weight 2.9 kg] without maternal or fetal complications.

Discussion

Pregnancy is a rare event in a woman on maintenance dialysis. The first case of successful delivery of a full term pregnancy was reported in 1971 [1]. The incidence of pregnancy in women on dialysis is 1 – 7% [2–9.2 per 1000 population] with a clear trend for rising incidence rate in the past 2 decades [2,3]. Fertility is markedly reduced in this group of patients due to uraemia induced hypothalamic dysfunction resulting in impaired normal ovarian ovulation cycle [4]. This explains the irregularity of menstrual cycle and an ovulation seen in women when they start dialysis [5]. In a longitudinal multicentre cohort study poor maternal and fetal outcomes were observed in patients with glomerular filtration rate [GFR] of less than 40 ml/min [GFR in dialysis patients < 10 ml/min] [6]. If pregnancy, however, occurs in a woman on dialysis, many fetal and maternal complications may be expected. Spontaneous abortion is common and accounts for 12.2% of cases [7]. Preterm labour is the mode of delivery in the vast majority of cases and it is unusual that pregnancy continues to full term as the case in our patient [Table 1]. Therefore low birth weight is very common to infants of mothers on dialysis [3]. Polyhydramnios and fetal congenital abnormalities are more prevalent in those on dialysis compared to general population with a very high rate of neonatal death [3]. Very few patients conceive and deliver more than once while on dialysis [8]. Moreover, women on dialysis are 10 fold less likely to deliver live birth compared to healthy population [9]. Maternal complications are also more common than healthy population and include preeclampsia [19.4%], hypertension and anaemia [3,10]. The care of a pregnant mother on dialysis is a team work that involves the nephrologist, the obstetrician, the nutritionist, the neonatologist and well trained nursing staff. From the nephrology perspective several issues have to be taken once pregnancy is confirmed. Table 2 provide summary of this care. Systolic pressure should not exceed 130 mmHg and diastolic pressure should be less than 90 mmHg. This may be difficult to achieve in a hypertensive dialysis patient but is essential to avoid

placenta insufficiency with uncontrolled hypertension with its known fetal and maternal complications. Angiotensin converting enzymes inhibitors and angiotensin receptor blockers should be strictly avoided because of fetal death and renal impairment [11,12]. Beta blockers should be avoided due to fetal growth retardation [13]. Anaemia is a common problem in both dialysis and healthy pregnancy. Haemoglobin levels should be maintained with the use of iron and

folate in addition to regular erythropoietin injections to achieve a haemoglobin level of 11–12 gm/l and possibly slightly higher in this young age group of patients. This target haemoglobin level is the same as what is recommended for dialysis patients [14]. Haemoglobin level higher than 13 gm/l should be avoided due to the cardiovascular risk and thrombosis in a hypercoagulable state of pregnancy [15,16].

Country	N	Pregnancy Incidence	SB	LB	Preterm	Full term	> 1 pregnancy
Saudi Arabia (1992) (Souquiyeh <i>et al</i>)	27	0.30%	19	8	8	none	5
Japan (1999) (Toma <i>et al</i>)	74	0.20%	9	36	NA	none	none
ANZDATA (2013) (Shahir <i>et al</i>)	49	2 per 1000	5	30	26	NA	none
Canada (2014) (Hladunewich <i>et al</i>)	22	NA	3	19	10	12	4
Italy (2014) (Piccoli <i>et al</i>)	21	0.7-1.1 per 1000	NA	21	14	5	none

Table 1: Pregnancy in women on dialysis according to countries (SB: Still Birth; LB: Live Birth).

Problem	Risk	Goal	Avoid
Hypertension	abortion, SB, IUGR	sytoic BP ≤ 130 mmHg diastolic < 90 mmHg	ACEI, ARB B-blockers, diuretics
Anemia	abortion, IUGR	Hb: 11 - 12 gm /l	Hb < 9 gm/l Hb > 13 gm/l
Alkalosis	SB, IUGR	adjust dialysis bath to achieve serum HCO3: 22 - 28 mmol/l	High dialysate HCO3 > 35 mmol/l
Uremia	abortion, SB, IUGR, preterm labour, preeclampsia	high dose dialysis kt/v > 1.5	dialysis dose < 1.5
Nutrition	abortion, SB, preterm labor	healthy balanced diet	malnourishment

Table 2: Renal measures during pregnancy of a dialysis patient (SB: stillbirth; IUGR: intrauterine growth retardation; BP: blood pressure; ACEI: angiotensin converting enzyme inhibitor; ARB: angiotensin receptor blockers; HCO3: bicarbonate; Hb: hemoglobin level).

Dialysis dose should increase in pregnancy to achieve high clearance [Kt/v] of 1.5 or more. Dialysis, therefore, should be 5 to 7 days per week for removal of uremic toxins to provide a near normal environment for the growing fetus. Intensive haemodialysis is associated with more live birth, higher gestational age and greater infant birth weight [17]. Frequent dialysis also allows for less fluid removal and hypotension and provides room for the nutritionist to provide healthy diet for the pregnant mother and her fetus. Bicarbonate in dialysis bath should not exceed 35 mmol/l because the

procedure is done daily and respiratory alkalosis is common in pregnancy for hormonal and mechanical reasons [18]. Heparin dose should be reduced or the running dose can be omitted to avoid antepartum haemorrhage. Fetal monitoring and timing of delivery are quite important issues. The fetus should be delivered if viable with any sign of distress. Pregnancy itself should not be allowed to go post term in order to avoid uteroplacental insufficiency seen in such cases. The available views for the care of a dialysis woman during pregnancy are based on the observations of the reported series in the literature given the rarity of such cases. By following such recommendations, it is possible, as in our case, that a woman on dialysis can have repeated pregnancy with the normal course and deliver full term healthy babies while on dialysis.

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