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CLINICAL ARTICLE

Obstetric outcomes in women with end-stage renal failure requiring renal dialysis

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Abstract

Objective: To study obstetric outcomes in women with end-stage renal failure undergoing chronic renal dialysis. *Methods:* A retrospective review of the database from the High-Risk Pregnancy Clinic at Singapore General Hospital, Singapore. *Results:* From 1995 to 2004, 7 women treated with chronic renal dialysis had a total of 11 pregnancies. There were 2 pregnancy losses at previable gestation ages and 9 live births. Median gestational age at delivery was 31 weeks, and mean birth weight was 1390 g. Seven newborns had a low birth weight and 5 required neonatal intensive care. Severe hypertension occurred in 4 women for a total of 7 pregnancies. Other complications included polyhydramnios ($n=2$), preterm prelabor rupture of membranes ($n=2$), obstetric cholestasis ($n=2$), postpartum hemorrhage ($n=1$), thrombosis of the arteriovenous fistula ($n=2$), postpartum peritonitis ($n=1$), and fetal anomaly ($n=1$). There were no maternal deaths. *Conclusion:* Such pregnancies are high-risk, particularly because of maternal hypertension and prematurity. They should be managed by multidisciplinary teams, and prepregnancy counseling should not be neglected.

1. Introduction

Pregnancy is rare in women with undergoing renal dialysis (hemodialysis [HD] or chronic ambulatory peritoneal dialysis [CAPD]) for end-stage renal failure. Those who become pregnant are at increased risk of adverse outcomes at all trimesters of a pregnancy, and a survey of the medical literature shows that infant survival is about 50% at best [1—5]. It is therefore not surprising that experience is limited to the few institutions with

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adequate resources for dealing with high-risk pregnancies.

The High-Risk Pregnancy Clinic of Singapore General Hospital, where the study was conducted, is part of a 1600-bed acute Tertiary Institution in Singapore that includes a renal medicine unit with a renal dialysis center. Stabilized patients requiring further dialysis are referred to community dialysis centers. Women with end-stage renal failure who become pregnant while undergoing chronic renal dialysis are referred to the High-Risk Pregnancy Clinic and are co-managed by the clinic's staff, renal physicians, and the women's dialysis center. Once pregnancy has been verified, the frequency of renal dialysis is increased to 6 times per week, each session lasting about 3 h, and the women receive increased supplementation of erythropoietin and water-soluble vitamins, particularly folate. The women are scheduled for more frequent antenatal visits (at least every 2 weeks), during which they are also seen by renal physicians. Fluid status, maternal weight, maternal serum electrolytes, renal function, and blood pressure are monitored. The aim is to ensure minimal fluctuations in fluid volume and balance, as well as maintain pH and electrolytes at near normal pregnancy levels and plasma urea levels below 20 mmol/L. During dialysis the women are appropriately positioned to avoid supine hypotension and are checked for hypotension. They are also checked for dialysis-induced uterine contractions; if present, the women are examined by an obstetrician to assess the need for tocolysis. Hypertension is defined by 2 blood pressure readings taken at least 4 h apart and greater than 140/90 mm Hg. Management of hypertension includes reviewing the adequacy of renal dialysis and investigating for pre-eclampsia. The women are asked for symptoms of fulminating pre-eclampsia, and full blood cell count, blood coagulation function tests, liver function tests, and serum uric acid level are carried out. Where necessary, antihypertensive medication is introduced or increased to maintain the blood pressure at 140/90 mm Hg. For obstetric management, more intensive fetal monitoring is performed, as serial fetal biometric measurements, biophysical profile, and fetal Doppler velocimetric assessment are frequently preformed to detect intrauterine growth restriction (IUGR) and placental insufficiency. Decisions regarding mode and timing of delivery are based on standard obstetric indications.

The aim of this article was to report obstetric outcomes in women undergoing chronic renal dialysis.

2. Methods

The database of the High-Risk Pregnancy Clinic of Singapore General Hospital was searched for women with end-stage renal failure who underwent chronic renal dialysis at the Singapore General Hospital from 1995 to 2004. The following data were collected: patient age; underlying renal etiology if available; duration of renal dialysis prior to pregnancy; medications taken during pregnancy; pregnancy complications; obstetric complications, especially pre-eclampsia, eclampsia, polyhydramnios, preterm labor, preterm premature rupture of membranes (PPROM), and IUGR; and delivery data such as gestational age at delivery, mode of delivery, birth weight, Apgar scores at 1 and 5 min, indication for admission to the neonatal intensive care unit, and fetal anomalies.

3. Results

The database search indicated that there were 11 pregnancies in 7 women. During this period the Singapore General Hospital Department of Renal Medicine saw 251 women of reproductive age undergoing chronic renal dialysis. Table 1 summarizes the demographic and obstetric characteristics of these women, and the main outcomes and pregnancy complications are summarized in Tables 2 and 3, respectively. HD was the more common form of dialysis in these patients, as only 1 woman received CAPD. The median duration of dialysis was 7 years. Three women had underlying systemic lupus erythematosus, but were in disease remission and had no reported disease flares during their pregnancies. They were taking azathioprine, and low-dose aspirin was added upon verification of pregnancy. Other medical conditions included ischemic heart disease ($n=1$), parathyroid adenoma ($n=1$), history of inferior vena cava thrombosis ($n=1$) and chronic pulmonary tuberculosis ($n=1$).

Table 1 Patient characteristics

Characteristic	$n=7$
No. of pregnancies	11
Maternal age, median (range), year	28 (25—39)
No. of women on HD	6
No. of women on CAPD	1
Duration of dialysis, median (range), year	7 (3—10)
Underlying renal pathology, no. of cases	
Glomerulonephritis	4
Systemic lupus erythematosus	3

Abbreviations: CAPD, chronic ambulatory peritoneal dialysis; HD, hemodialysis.