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Case Report

Beta HCG levels in a pregnant dialysis patient: a cautionary tale

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Abstract

Conception is rare in patients on chronic dialysis and diagnosis is often delayed as it is least expected. Serum beta HCG levels are elevated in both pregnant and non-pregnant dialysis patients, and pregnant dialysis patients have slightly higher beta HCG levels when compared with normal pregnancy. This can be erroneously interpreted as non-viable pregnancy and so results should be viewed with caution. Serial beta HCG levels must be followed when non-viable pregnancy is suspected in a dialysis patient before contemplating termination of pregnancy as described in our case.

Keywords: alpha-fetoprotein; beta HCG; dialysis; pregnancy

Introduction

Conception is unusual in women treated with conventional dialysis, with estimates ranging from 0.3% to 1.5% per year [1–4]. The diagnosis of pregnancy has often been made late in gestation because it is unexpected and because amenorrhea and nausea are common in dialysis patients. A review from 1987 found the average gestational age at diagnosis of pregnancy to be 16 weeks [5]. It has long been recognized that beta HCG levels are elevated in both pregnant and non-pregnant dialysis patients. Slightly elevated levels occasionally cause problems such as postponement of surgery while waiting to demonstrate that levels are not rising. High levels of beta HCG in pregnant dialysis patients rarely caused a problem in pregnancies diagnosed late because ultrasound was used to determine gestation age, but at least one pregnancy was terminated because of a suspected hydatidiform mole [6]. The elevated levels become more important when the index of suspicion is higher and pregnancy is diagnosed earlier. We present a case in which misinterpretation of beta HCG levels led to consideration of terminating a viable pregnancy.

Case report

In August 2005, a 25-year-old woman on hemodialysis was referred to our renal clinic with a positive pregnancy test based on serum beta HCG. She had end-stage renal disease secondary to type 1 diabetes and had started dialysis 9 months prior to her visit. Her last menstrual period was 6 weeks prior to the visit. She had had two previous pregnancies, the first resulting in spontaneous abortion in the first trimester and the second resulting in the delivery of a baby at 30 weeks gestation. The second pregnancy was in 2001. She was not told that she had kidney disease during her previous pregnancies. Her past medical history was significant for diabetes since age 9 with retinopathy and nephropathy. She was not aware of any kidney disease until she reached the point of needing dialysis in September 2004 and had been on thrice weekly dialysis since then. Her medications included insulin, RenaGel, PhosLo, folic acid and MVI. On exam, her BP was 112/67 mm Hg and she did not have any edema. Her beta HCG levels were 13 270 mIU/mL at the time of her pregnancy test and increased to 30 232 mIU/mL within 3 days. The plan was to increase her dialysis regimen to more than 20 h per week and she was referred to the care of high-risk obstetrics. She had a transvaginal ultrasound scan, which showed an intra-uterine gestational sac of 5.3 weeks, but no fetal heart tone could be detected. Given that she had HCG levels consistent with 7 or more weeks gestation without visible cardiac activity, she was thought to have a non-viable pregnancy and surgical termination was contemplated once her blood sugars were well controlled. Beta HCG levels were followed with the expectation that they would drop in the setting of a non-viable pregnancy. Her beta HCG levels are charted below:

Weeks gestation	Patient's beta HCG	Normal beta HCG
5 weeks	13 270	75–2600
5 weeks 3 days	30 323	850–20 800
5 weeks 5 days	44 685	850–20 800
7 weeks	133 708	4000–100 000

A transvaginal ultrasound was repeated in 10 days and showed an intra-uterine pregnancy consistent with a gestational age of 7 weeks and with good fetal heart tones at a rate of 128 bpm. She continued with her pregnancy and was started on 5× weekly dialysis. Although, in the sec-

ond trimester, she had an abnormal triple antigen screening test for fetal abnormalities, she delivered a healthy baby weighing 3.5 kg at 32 weeks without any further complications.

Discussion

Pregnancy in dialysis patients is a major challenge to physicians involved in care, given the rarity of occurrence, complications involved and the distressing observation that <50% of pregnancies in patients receiving conventional dialysis result in surviving infants [3]. Outcomes in patients receiving nocturnal hemodialysis have been more encouraging, making accurate interpretation of beta HCG levels more important. Serum beta HCG levels should be interpreted with caution in dialysis patients as levels tend to be slightly elevated even in non-pregnant patients and can be erroneously interpreted as intact pregnancy in a non-pregnant patient or a non-viable pregnancy in a pregnant patient as in our case.

HCG is secreted in small amounts by all cells [7], and since the hormone is largely excreted by the kidneys, its level can be elevated in dialysis patients even if not pregnant. In a study conducted by Schwarz *et al.*, beta HCG levels were increased by 10-fold in two of the 19 non-pregnant women who were on dialysis with post-dialysis levels being significantly higher than pre-dialysis levels. This observation has an important implication in clinical practice when monitoring serial beta HCG levels (pre- or post-dialysis blood sample should be specified when results are reported). Further studies need to be conducted in pregnant dialysis patients as data are limited on pre- and post-dialysis values of HCG. Since serum beta HCG levels are not reliable in dialysis patients, pregnancy is normally confirmed by an ultrasound. Fetal cardiac activity can be first detected at 5.5–6 weeks and can be missed if imaging is done earlier. If a non-viable pregnancy is suspected in a dialysis patient early in the first trimester, the diagnosis should be confirmed by measuring serial beta HCG as it decreases in a non-viable pregnancy, albeit more slowly than in a woman with normal renal function. Maternal serum alpha-fetoprotein levels should be monitored simultaneously. The triple antigen test which is used for screening fetal abnormalities might not be reliable in dialysis patients [8]. The patient reported in our case would have had a therapeutic abortion in her first trimester if not for the poorly controlled diabetes. Pregnancy in a dialysis patient might represent the last opportunity for child bearing and every effort should be made to ensure a successful outcome.

Conflict of interest statement. None declared.

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