

Successful completion of the first trimester despite the inappropriate rate of rise of the serum beta human chorionic gonadotropin levels

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Summary

Purpose: To report an exception to the rule that once slow rising serum beta human chorionic gonadotropin (hCG) levels are observed, a live fetus after 12 weeks is not possible even if fetal viability was detected earlier. **Materials and Methods:** The fetus of a woman with a slow rising serum beta-hCG levels which even plateaued was evaluated by serial pelvic sonography. **Results:** The fetal pole grew appropriately but at one point the sac size was a week behind. Nevertheless the woman completed the first trimester with a viable fetus and a normal fetal heart rate. **Conclusions:** Though rare, a live fetus at the end of the first trimester is possible if even if there is a slow rise of sera hCG levels where there is at least one instance when the hCG levels do not double in two days.

Key words: Beta-hCG level; Rate of rise; Live fetus; Sac size.

Introduction

The authors previously published a manuscript showing that in 16 women who showed a positive heart beat despite at least one serum beta human chorionic gonadotropin (hCG) level that did not double appropriately demonstrating no viable pregnancies at 12 weeks [1]. Since this publication in 2003 they have been seeking one case that would be an exception to the rule that if the beta-hCG level fails to double appropriately, even once, there will be an inevitable fetal loss by 12 weeks even if viability is found earlier in the first trimester. This case report identifies the first exception to the rule.

Materials and Methods

A 35-year-old woman with primary infertility was treated with clomiphene citrate with luteal phase progesterone support because she was anovulatory. She conceived and her first beta-hCG level was obtained 15 days from conception and was 134 mIU/ml. Table 1 lists the serum beta-hCG levels according to days post-conception.

Her first ultrasound was performed on day 23 from conception. An eight-mm gestational sac was found consistent with 5.3 weeks. One week later a five-mm crown-rump length was found but the sac only grew to ten mm, consistent with 5.6 weeks.

One week later (37 days from conception) the sac grew to 16 mm, consistent with 6.38 weeks whereas the fetal pole grew to 11 mm, consistent with 7.2 weeks. Three weeks later (day 57) with a drop in the beta-hCG level from a week earlier from 48,813 to

40,363, the crown-rump length (CRL) measured 33 mm, consistent with an appropriate ten-week size. However, the sac was only 35 mm, consistent with 8.4 weeks.

Up to this point there had been a subchorionic hematoma. This disappeared the following week with the ultrasound showing a CRL of 46 mm, consistent with 10.26 weeks. Her last ultrasound was performed 77 days from conception; everything was perfect on ultrasound with a heartbeat of 153 beats per minute.

Discussion

Not only did this woman show an inadequate rise in the beta hCG level from 21 to 23 days from conception, there was also a very inappropriate rise the following week. Finally the ultimate plateauing of the serum beta-hCG levels strongly suggested that the fetus would die; but it did not happen. Also, against a normal outcome was that when the CRL measured eight weeks, the sac was one week behind at seven weeks [2].

Though the present authors published the manuscript showing that slow rising beta-hCG predict fetal demise by the end of the first trimester, even if viability was seen earlier, the data used was from a different study involving pregnancies from 12/95 to 8/00. These data found 16 women out of 158 consecutive pregnancies that had a slow rise of the serum beta-hCG levels with viability at eight weeks but with a miscarriage by 12 weeks [1]. Since that time the present authors decided to evaluate a larger series to see what is the true chance of a live fetus under these circumstances. After failing to find even one exception to the

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Table 1. — Serum beta-hCG levels according to days post-conception.

Days post-conception	Serum beta-hCG level (mIU/ml)
15	134
17	370
21	2,161
23	3,037
30	8,125
37	17,439
45	37,598
49	48,813
57	40,363
64	42,620
71	41,221
77	39,464

rule after evaluating 1,000 consecutive pregnancies, the authors abandoned the prospective study and just alerted their staff to be on the lookout for even one case report.

As an infertility practice the present authors carefully follow 95% of their pregnancies through the first trimester. Despite thousands of pregnancies over nine years since their previous publication showing an incidence of slow rising beta-hCG levels with early viability at eight weeks to be about 10%, this is the first one completing the first

trimester and actually did deliver a It will be important to determine if she delivers a live healthy fetus (actually she did deliver a healthy full-term girl).

The knowledge that at least it is possible to have a live baby with a slow rising serum beta-hCG is important since with no precedent some women will discontinue therapy aimed at reducing miscarriage risk, e.g., progesterone supplementation. This case report may encourage some women to continue aggressive therapy aimed to prevent a pregnancy loss.

References

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