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Screening for Twin Pregnancy

Abstract. *A group of 590 women who, 4 to 5 weeks after their last menstrual period, were confirmed to be pregnant, as measured by the human chorionic gonadotropin (hCG) by radioreceptor assay. Nine of these women had serum hCG levels approximately twofold higher than the others and were suspected of having twin pregnancy. When these women were tested at 12 weeks of gestation, pelvic sonography confirmed twin pregnancies in all the nine cases. Serum hCG levels thus provide a simple, rapid, and easy method to detect twin pregnancy.*

Fetal risk in twin pregnancies are three to four times higher than in single gestation (*1*). The combined effects of prematurity and intrauterine retardation are the main causes of perinatal wastage in multiple births. Moreover, maternal complications in twin pregnancy are increased and include preeclampsia, polyhydramnios, anemia, and intrapartum complications (*2*). The prognosis for twin pregnancy can be considerably improved by early diagnosis and adoption of prophylactic measures. For example, in one study, the incidence of premature labor was reduced to 2 percent in patients with strict bed rest, as compared to 12 percent in the other patients with twins (*3*). At present, 50 percent of all twin deliveries are discovered only at delivery (*4*). Serum titers of human placental lactogen have been shown to be diagnostic of twins at 29 weeks of gestation (*5*). Pelvic ultrasound can detect twins at 12 weeks of gestation (*1*); however, sonography is expensive, time-consuming, and not widely available. An earlier screening test, therefore, is needed to provide for optimal care in twin pregnancy.

Seven days after conception, human chorionic gonadotropin (hCG) can be detected in serums of pregnant women by radioimmunoassay and radioreceptor-assay (RRA), which detects hCG or luteinizing hormone (or both) (*6*). During the last 3 years, more than 5000 women were screened for pregnancy with the RRA for hCG. There has been nearly 100 percent reliability in the detection of pregnancy at the time of missed period. The level of hCG has been a good index for the size, weight, and function of the placenta in pregnancy (*7, 8*).

From July to November 1976, a total of 590 serum samples obtained from women 4 to 5 weeks after their last menstrual period were positive for hCG by the RRA. The hCG levels of nine of these samples were significantly higher than those of the other 581 samples. At least four subsequent determinations were obtained on each of these nine patients during the first 70 days of gestation. Pelvic sonography was performed in all nine of these patients. Fifteen of the 581 women, with normal hCG titers for 4 to 5 weeks of gestation, were followed with weekly determinations of serum hCG. All 15 delivered single infants at full term. Therefore, their serial hCG levels were used as the control.

As is shown in Table 1, the levels of hCG at the time of the missed period (33 days from the last menstrual period) were, approximately, twofold greater in the women carrying twins than in those carrying single infants. In the cases of single-infant gestation, hCG rose from 1 to 1000 ng/ml within 30 days, whereas in the women with twin gestations hCG rose from 1 ng/ml to 1000 ng/ml, within 10 days [1 ng of hCG = 12 milli-international units (mIU)]. The hCG reached a plateau at 10 weeks in the women with single gestations with a range of 8,000 to 12,000 ng/ml. The hCG plateau in the women carrying twins also occurred at 10 weeks but with a range of 20,000 to 40,000 ng/ml. All of the nine women who showed the higher hCG levels were confirmed by pelvic sonography to have twins. These observations show that the determination of serum hCG early in pregnancy could be used as a screening test for twins and would be useful in patients who have a high probability of carrying twins, such as in cases of ovulation induction. Therefore, the physician is able to take prophylactic measures at the earliest possible time.

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Table 1. Comparison of hCG (1 ng hCG = 12 milli-international units) levels in single and twin pregnancies. Abbreviations: LMP, last menstrual period; LH, luteinizing hormone.

Days from LMP	Single gestation hCG or LH (ng/ml)		Twin gestations hCG or LH (ng/ml)	
	Mean*	Range	Mean†	Range
28	5.39	0.78 to 10	5.39	0.79 to 10
33	37.5	25 to 50	125	100 to 150
36	125	100 to 150	1,600	200 to 300
40	300	200 to 400	4,862	725 to 9,000
45	3,000	1,000 to 5,000	10,500	6,000 to 15,000
70	10,000	8,000 to 12,000	34,500	29,000 to 40,000

*Mean from 15 women with normal single gestation. †Mean from nine women with twin gestation.

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