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## A NORMALLY RISING HCG DOES NOT PREDICT LIVE BIRTH IN WOMEN PRESENTING WITH PAIN AND BLEEDING IN EARLY PREGNANCY

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Dear Editor,

We have undertaken a retrospective cohort study to determine whether, in women who present with pain and bleeding in early pregnancy, serial human chorionic gonadotrophin (hCG) levels can be used to predict progress beyond the first trimester. We hypothesised that a normally rising hCG would predict live birth in women presenting with pain and bleeding in early pregnancy.

The study group consisted of 340 women who presented with pain and/or bleeding at <12 weeks gestation and who had an inconclusive ultrasound scan at their first visit to the Pregnancy Support Centre. The mean (+/-SD) age and median parity (range) of the cohort were 30 (+/-6.5) and P0 (0 – 5), respectively. 19% (64/340) were current smokers. All women were monitored with serial hCGs (defined as two hCGs taken 48hrs apart) to exclude ectopic pregnancy. Pregnancies were categorised by the percentage change in the first two hCG measurements taken 48hrs apart: 'normally rising' ( 66%), 'slowly rising' (increase of <66% but >10%), 'static' (increase or decrease 10%) or 'falling' ( 10%). Pregnancy outcome was recorded as livebirth, miscarriage, ectopic pregnancy and pregnancy of unknown location. Data were analysed descriptively using GraphPad Prism (version 5.0). Confidence intervals for percentages were calculated by Wilsons method.

The proportion of pregnancies with 'normally rising', 'slowly rising', 'static' and 'falling' hCGs was 18.5% (63/340), 12.4% (42/340), 6.2% (21/340), 62.9% (214/340), respectively. There were no significant differences in maternal characteristics (age, parity, smoking status) between groups identified (data not shown). The pregnancy outcomes for each hCG group are shown in Table 1. As expected, no pregnancies with 'falling' or 'static' measurements continued beyond the first trimester. However, we were surprised to find only 57% (36/63) women with 'normally rising' measurements had a live birth. Two women (4.8%, 2/42) with 'slowly rising' hCGs also had a live birth.

To our knowledge, this is the largest study to date that has related serial serum hCG profiles in women presenting with pain and/or bleeding in the first trimester of pregnancy to live birth.

Our finding that only 57% of women with 'normally rising' hCGs went on to have live birth is lower than a similar but much smaller study claiming a livebirth rate of 81.6%. [1]

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However, this study examined a population of asymptomatic infertile patients who had undergone a variety of fertility treatments to achieve pregnancy. This compared to our study population that consisted of women who conceived spontaneously and subsequently presented with pain and / or bleeding in the first trimester. Thus, it is clear that a 'normally rising' hCG profile is no guarantee of a live birth in women who present with pain and/or bleeding in the first trimester of pregnancy after spontaneous conception.

We were also surprised to find that two women with 'slowly rising' hCGs subsequently went on to have a live birth. This conflicts with previously published data that showed that a 'slowly rising' hCG was not associated with continuation beyond the first trimester, even when fetal heart activity had been demonstrated on ultrasound. [1]

Thus we conclude that, contrary to our hypothesis, a 'normally rising' hCG should not be used to reassure women and predict livebirth in women presenting with pain and / or bleeding in early pregnancy. We suggest that further studies are required to develop novel biomarkers to predict and diagnose pregnancy outcome and location in women who present with pain and bleeding in early pregnancy. [2]

## References

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**Table 1**

Pregnancy outcome for each hCG group.

hCG group	Pregnancy outcome			
	Livebirth	Miscarriage	Ectopic	Pregnancy unknown location
Normally rising (n=63)	36 (57%)	17 (27%)	10 (16%)	0
Slowly rising (n=42)	2 (5%)	18 (43%)	18 (43%)	4 (9%)
Static (n=21)	0	6 (29%)	11 (52%)	4 (19%)
Falling (n=214)	0	196 (92%)	6 (3%)	12 (6%)