TENNESSEE REPRODUCTIVE MEDICINE

Early Pregnancy Pearls

Singleton Ultrasound Findings by Gestational Age

EGA	Ultrasound Findings	Typical hCG Level
4 weeks	No sac	50-100 mIU/ml
5 weeks	Eccentrically located sac with hyperechoic ring Yolk sac visible	1800-3000 mIU/ml
5 w 6 days	CRL: 2.2-2.7 mm Early cardiac motion possible < 90 bpm is abnormal	> 3000 mIU/ml
6 w 2 days	Nearly 100% of viable pregnancies have cardiac activity	

Sonogram Findings & Miscarriage (SAB) Risk

- **No cardiac activity: SAB risk by crown rump length (CRL)**

CRL	Miscarriage rate
3.4 - 3.8 mm	88%
4.0 - 5.2 mm	92%
5.3 mm	99%
5.6 mm	100%

- **Slow embryo growth:** CRL growth of < 0.2 mm/day for 7 days, or < 1.4 mm in 1 week = 100% miscarriage risk

- **Empty Sac:** SAB rate by Mean Sac Diameter (MSD) – in mm^3

MSD	SAB rate
16 mm^3	95%
> 21 mm^3	99%
> 25 mm^3	100%

- **Empty Uterus**: if no gestational sac develops by 5 weeks 4 days, pregnancy has nearly a 100% non-viable rate

These 100% miscarriage rates incorporate intra-observer variability in published literature and may not reflect the accuracy of sonograms performed in local clinical settings.

hCG Levels - Assume Singleton Pregnancy and No Fertility Treatment

- hCG is typically 50-100 mIU/ml 14 days after ovulation
- ***Minimal acceptable rise is 35% in 48 hours***
- ***Typical rise is 50% over 48 hours***
- Multiple gestations may have abnormal hCG rises (including no rise) early in gestation, if one pregnancy is failing and the other is growing
- At 5 weeks, or once hCG ≥ 3000 mIU/ml, velocity of hCG rise decreases
- hCG peaks at 10 weeks (50-100K), then declines (to 1K) by term
- After a heartbeat is seen, hCG is of little clinical value
- If hCG > 2000 mIU/ml, absence of a gestational sac indicates non-viable pregnancy (ectopic or miscarriage)
- Most fertility drugs increase multiple gestation risk, so hCG rise is less predictable & subject to more variation

Progesterone (P) Levels at < 7 weeks (unsupplemented)

- < 6 ng/ml indicates a non-viable pregnancy in 99% of cases
- 5 – 25 ng/ml indicates possible viability
- > 25 ng/ml usually indicates a viable gestation within the uterus
- Values do not reliably distinguish between ectopic and miscarriage
- A low P is almost always a reflection of a pregnancy doing poorly, ***not a cause of miscarriage***

Using hCG, ultrasound and serial observations to establish viability:

- Even if LMP is unknown, initial hCG level can estimate the minimal time a pregnancy has been established; serial hCGs can be followed
- 14 days after ovulation, hCG should be 50-100 mIU/ml
- If you see no gestational sac 2 weeks later, you can reasonably conclude this is a non-viable pregnancy (SAB or ectopic)

To refer patients or speak to Dr. Murray or Dr. Scotchie, call 423-TRM-BABY
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