FOLLICULAR MONITORING AND FETAL ABNORMALITIES DR. SONAL PANCHAL

Assessment of the follicular maturity and endometrial receptivity and the time of hCG is one of the key factors for success of all ART procedures. Maturation of the follicle and the endometrium , ovulation and leutinization is a process of multiple biochemical, morphological and vascular changes. The vascular changes are reflection of the biochemical changes and can be studied by colour Doppler. A follicle that is at least 16mm in size may be generally considered a mature follicle. But its functional maturity can be confirmed only by seeing the blood vessels covering 3/4th of its circumference with the resistance index(RI) of < 0.48 and peak systolic velocity(PSV) of > 10cms/sec. It is this vascular supply that leads to oxygeneation of the ovum. Hypoxia leads to segregation disorders in the ovum and results in chromosomal abnormalities in the embryos. It is for this reason that monitoring the follicle maturity and time of trigger by doppler can decrease the incidence of chromosomal abnormalities in the ART babies. 3D ultrasound gives a better assessment of the follicular size and vascularity. Follicular vascularity distribution and flow indices can be better parameters of follicular quality and can be more reliable parameters to decide the time of hCG and IUI. Endometrial assessment can be more meaningful if its morphology is studied more in detail along with abundance of its vascularity as well as flow indices rather than thickness alone. Endometrial vascularity confirms the receptivity of the endometrium. Better vascular supply to the endometrium is an assurance towards not only better implantation rates but also towards better ongoing pregnancy rates and less abortion rates. Endometrial vascularity should reach the inner layers of endometrium with RI of < 0.6 and the uterine artery PI9pulsatility index) of <3.2. Thus deciding correct time of hCG can improve conception rates decrease abortion rates and also decrease the incidence of chromososmal abnormalitiies in ART cycles.

Hormonal and ultrasound dialogue in PCOS Dr. Sonal Panchal

Polycystic ovarian syndrome (PCOS) is a complex endocrine condition in which ovulatory dysfunction and androgen excess are cardinal features. It is a heterogeneous condition, the patho-physiology of which appears to be both multi-factorial and polygenic. Polycystic ovaries on ultrasound is one of the key features for diagnosis of the syndrome.

This assessment is done on baseline ultrasound scan. Large ovarian volume(>10cc) and antral follicle count > 20 per ovary are generally considered for diagnosis. But stromal abundance is an important component. This can be diagnosed by increased echogenecity of the ovarian stroma, increased ovarian and stromal area but most reliably with ovarian volume and stromal volume. 3D ultrasound is especially useful for counting the antral follicles by Sono AVC and ovarian and stromal volume measurements. Volumes when calculated by 3D ultrasound using VOCAL (Volume calculation) software, are much more reliable than volumes calculated by 2D ultrasound (US). 3D power Doppler assessment has been found to be highly promising as it gives idea about the global vascularity of ovaries.

Studies have shown that the size and antral follicle counts have variable thresholds depending on the age and ethnicity. Stromal abundance which is the more consistent feature varies according to the severity of the syndrome. Stromal volume was positively correlated with serum insulin levels in PCOS patients and excess stroma indicates hyperinsulinemia. But more stroma also indicates anovulation due to increased LH. Antral follicle count can be correlated with the androgen and AMH levels. Androgen is the cause and AMH is the result of more antral follicles. Vascularity of the stroma is the first response to rising LH due to neoangiogenesis and also due to vasodilatation due to VEGF.

Understanding the ultrasound features therefore can explan the biochemical variations in PCOS patients.