

POLYCYSTIC OVARIAN SYNDROME : DR. SONAL PANCHAL

Polycystic ovarian syndrome (PCOS) is a complex endocrine condition in which ovulatory dysfunction and androgen excess are cardinal features. It has metabolic and endocrinal components, that are both inter-related. The polycystic ovary syndrome (PCOS) is a heterogeneous condition, the patho-physiology of which appears to be both multi-factorial and polygenic. Ultrasound diagnosis of polycystic ovary is one of the key features for diagnosis of the syndrome.

This assessment is done on baseline ultrasound scan with transvaginal probe. Doppler is mandatory to understand the hormonal dynamics of PCOS. 3D ultrasound is especially useful for 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.

B mode ultrasound assessment of the ovaries consists of assessment of ovarian diameters and volume and counting of antral follicles and qualitative & quantitative assessment of stroma. Number of antral follicles are counted by B mode or 3D ultrasound. Doppler is used to see presence of vessels in ovarian stroma. 3D ultrasound provides a new method for objective quantitative assessment of follicle count, ovarian volume, stromal volume and blood flow in the ovary. SonoAVC with post-processing (PP) is a reliable method for measuring total AFC.

Criteria of the polycystic ovaries on ultrasound are ovaries that are $> 10\text{cc}$ in volume and/or has more than 20 antral follicles ESHRE 2018 criteria.

The antral and atretic follicles get arranged peripherally or are dispersed in the stroma and thus may categorize polycystic ovary as peripheral and general cystic pattern. Stromal abundance is the most consistent and reliable feature for diagnosis of polycystic ovaries. Abundance of stroma can present as increased echogenicity of stroma, increased stromal area or ovarian area or as increased ovarian and stromal volume. Stromal volume was positively correlated with serum androstenedione concentrations and hyperinsulinemia in patients with polycystic ovarian syndrome.

Ovaries of PCOS women have more stromal flow that can be correlated to high LH that leads to neoangiogenesis and vasodilatation. Vascularity further increases with hyperandrogenemia and hyperinsulinemia. Stromal abundance is the result of anovulation and results due to high LH over multiple cycles. Antral follicle count and ovarian volume showed significant correlation with AMH, total testosterone and free androgen index. Androgen is the cause and AMH is the result of more antral follicles.

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