Polycystic Ovary Syndrome-Applications

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Editorial Note

Polycystic Ovary Syndrome (PCOS) is a commonly occuring, heterogenous endocrine disorder in women of reproductive age with a prevalence of 5-10% worldwide. The characteristics of PCOS are hyperandrogenism, chronic anovulation and polycystic ovaries. According to Rotterdam 2003 criteria, PCOS can be divided into four different phenotypes: hyperandrogenism, chronic anovulation and polycystic ovaries; chronic anovulation and polycystic ovaries but no clinical or biochemical hyperandrogenism; hyperandrogenism and chronic anovulation but normal ovaries; hyperandrogenism and polycystic ovaries but ovulatory cycles. PCOS is reproductive as well as metabolic disorder and is a foremost cause of an ovulatory infertility among premenopausal women. It is reported that oocytes of PCOS females have low quality and fertilization rate which might be due to abnormal levels of androgen or insulin. The obesity, genetic factors, environmental factors, plays a synergistic role in PCOS females. Alterations in numerous metabolic pathways have been implicated in the pathophysiology of PCOS. However, PCOS women either having hyperandrogenism with normal menstrual cycle or anovulation with normal levels of androgens, are llikely to have lesser metabolic abnormalities. It has been reported by different studies that PCOS women have increased tendency to obesity and abnormalities of lipids and lipoproteins.

Ovulatory dysfunction of PCOS patients is associated with the raised production of serine, threonine, phenylalanine, tyrosine and ornithine. The systemic changes in PCOS initate changes not only in the ovarian function but also in the whole-body metabolism. This emphasized the need to understand the metabolic dysfunction in PCOS for deterrence of long-term complications through apposite screening, diagnosis and intervention. Metabolomics has become an imperative tool in distinguishing changes in metabolic pathways and the verdict of human disease. Comprehensive approaches to gain insights into metabolic variation and diseases, by more refined metabolic phenotyping, have become increasingly popular. Metabolomics, aim at the recognition and quantification of all metabolites and impart a way to find functional biomarkers for the diagnosis of PCOS and scrutinize changes in biochemical pathways. Due to its non-destructive nature, reproducibility and high resolution, nuclear magnetic resonance (NMR) technique is used in present study for metabolic profiling of PCOS.

Studies on metabolomics from different countries have been reported whereas there is only a single study from India. Indian women are at higher risk of developing type 2 diabetes and insulin resistance. A study on Punjabi females suggested a prevalence of 14.8% overweight females and 13.8% obese females, which is characteristic of PCOS and gives the drive to carry metabolomics study on North Indian women. The present study focused on the metabolic profiling of PCOS women and could provide baseline data of metabolites in PCOS women for further studies in North India.

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