

The Pro-Inflammatory and Anti-Inflammatory Cytokines as Key Tool for Infertility Linked PCOS Diagnosis and Treatment Efficacy

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Editorial

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Editorial

Polycystic Ovary Syndrome (PCOS) and PCOS related ovarian dysfunction are the main causes of anovulatory infertility. PCOS is estimated to have prevalence as it represents 20%-33% in the general population [1]. There is variation in the prevalence of PCOS as reported 15-20% in other publications based on the diagnostic criteria followed [2]. The pathophysiology of this syndrome is still not completely understood as it has not been addressed clearly. The result of initial autopsies of placenta from women with PCOS has shown macroscopic and microscopic alteration in comparison to healthy control group.

At the molecular level, it has been extremely difficult to pin down the genes responsible for PCOS. Data from Genome wide Association Studies (GWAS) results showed, The DENND1A (Differentially Expressed in Normal and Neoplastic Development isoform A1) gene was identified as a potential risk marker. McAllister's group showed that DENND1A.V2 protein is more expressed in PCOS theca cells compared to normal theca cells that subsequently resulting in increased androgen biosynthesis. It has been proven that the DENND1A variant 2 is potentially one of the mechanisms involved with the intrinsic abnormality in ovarian theca cells steroidogenesis in PCOS [3].

Among the current challenges, it has been reported that infertility affects 40% of women with PCOS [4]. PCOS is reported as the most common cause of anovulatory infertility. It is estimated that 90%-95% of anovulatory women presenting to infertility clinics have PCOS. PCOS women show a normal number of primordial follicles and

primary and secondary follicles are increased significantly. Because of the derangements in factors involved during normal follicular development, its growth gets impacted. The follicular growth becomes arrested as the follicles reach a diameter ranging between 4 to 8 mm. As a result, the dominant follicle does not develop and the ovulation does not ensue [5]. Further, spontaneous abortion incidences occur more frequently in PCOS ranging from 42%-73% [6,7].

In addition, PCOS women who are manifested with obesity, hyperandrogenism and insulin resistance are less likely to respond to the common treatment protocols. This is to suggest that extra factors could be prominent causes for the pathophysiology of the disease. Given the multifaceted pathogenesis of PCOS, the disease is considered as a heterogeneous disease characterized by chronic oligoanovulation as manifested by clinical and biochemical dysregulation [8-10].

A growing body of evidences have demonstrated that PCOS is a low grade pro-inflammatory state. Furthermore, a strong body of literature has shown that the Pro-inflammatory cytokines were found to be elevated in PCOS women [11-13]. Cytokines are directly involved in maintaining the delicate balance of hypothalamo-pituitary ovarian axis and the maintenance of normal menstrual cycles [14]. This is to highlight the importance of performing the cytokine panel test as a screening and monitoring tool during the course of treatment.

The Pro-inflammatory cytokine, interleukin (IL)-1 activates the hypothalamus-pituitary-adrenal (HPA) axis

[15]. HPA axis controls adrenal steroidogenesis and metabolic factors including insulin and obesity related signals [16]. Also, IL-6, TNF α and MCP-1 were found to have a high statistical significance in PCOS women [1,17].

The focus of this short editorial review is to address the importance for measuring the two sets of cytokines, the Pro-inflammatory and Anti-inflammatory. The cytokine array/ panel measurements can be performed by using a very small blood sample as a screening diagnostic tool. The cytokine panel testing will be a key and diagnostic tool monitoring during the protocol used for PCOS treatment with the support of the hormonal testing conducted routinely.

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