



Category: Miscellaneous

# Altered Expression of Angiogenic Factors in Follicular Fluid of Women with Polycystic Ovary Syndrome (PCOS)

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## Abstract

Polycystic ovary syndrome (PCOS) is a common and heterogeneous disorder, affecting women at reproductive age. Follicular growth is arrested in PCOS leading to cysts formation and anovulation. Follicular fluid produced in the growing antral follicles provides the micro-environment for developing oocyte and contains several factors including proteins, steroids, polysaccharides, and metabolites that modulate oocyte developmental competence and ovulation. Our earlier study on comparative proteomics of follicular fluid (FF) has revealed alteration of several angiogenic factors and ECM proteins [1] in PCOS women indicating angiogenesis may be altered in PCOS. Angiogenesis is crucial for follicular growth, selection of dominant follicle, ovulation and further corpus luteum (CL) formation, and these processes are affected in PCOS.

Vascular endothelial growth factor A (VEGFA) and basic fibroblast growth factor (bFGF) are important angiogenic factors. We measured them in FF and serum by ELISA and observed higher level of VEGFA and lower level of bFGF in PCOS compared to control. The ECM proteins, heparin sulfate proteoglycan and fibronectin1 which plays role in angiogenesis were also downregulated in PCOS. The angiogenic capacity of FF from PCOS and Controls were evaluated by tube formation and scratch wound assay using human umbilical vein endothelial cells (HUVECs) and found to be altered in PCOS. Glycosylation is most abundant PTM and many of the angiogenic proteins found in our proteomic study undergo glycosylation and hence we carried out glycoproteomic analysis of FF by enriching glycoproteins using lectins followed by iTRAQ LC-MS/MS analysis. We found glycosylated SERPINA1, an anti-angiogenic protein to be up-regulated in PCOS. This indicates the follicular angiogenesis is altered in PCOS. Further studies are ongoing to gain more knowledge of angiogenic factors that are involved in PCOS pathophysiology and to develop new treatment strategies.

## References

[1] Ambekar, A.S., Kelkar, D.S., Pinto, S.M., Sharma, R., Hinduja, I., Zaveri, K., Pandey, A., Prasad, T.S., Gowda, H. and Mukherjee, S. (2015) Proteomics of follicular fluid from women with polycystic ovary syndrome suggests molecular defects in follicular development. *J Clin Endocrinol Metab* 100: 744-753. <https://doi.org/10.1210/jc.2014-2086>

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