Can Oxylipins predict long-term health problems in women with PCOS?

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Background: Polycystic ovarian syndrome affects about 10%-26% women of reproductive age group and is characterized by adverse metabolic profile. These women have the risk factors like dyslipidimia, diabetes, obesity that makes them more susceptible to develop pregnancy complications like pre-eclampsia (PE) and cardiovascular disease (CVD) later in life. The oxylipins are lipophilic signaling molecules derived from the oxidation of polyunsaturated fatty acids. Epoxyeicosatrienoic acids (EET's) and hydroxyeicosatetraenoic acids (HETE's) are a subset of oxylipins and are generated from arachidonic acid by cytochrome P450 in the brain, lung, kidney, and peripheral vasculature. These subsets of oxylipins are known to play crucial roles in the regulation of renal, pulmonary, and cardiac function and vascular tone.

Objective: To determine whether measuring oxylipins in serum would help predict women who are more susceptible to develop PE and CVD.

Design: A cross sectional study involving 59 (49.2%) women with PCOS and 61 (50.2%) controls.

Method: Fasting blood was collected. After Solid Phase Extraction, (SPE) LCMS was used for analyzing the samples.

Results: Difference between PCOS and control was analyzed using t-test or non-parametric tests. Statistical significance was shown when the p-value <0.05 (2-sided). 14,15 DHET and 19 HETE were significantly raised in women with PCOS compared to controls.

Conclusion: 14,15 EET’S are known to be cardio-protective and they are very rapidly hydrolyzed to stable compounds called DHET'S. The 14,15 DHET are physiologically less active and might depict low levels of 14,15 EET. The high level of 14,15 DHET in women with PCOS may be indicative that these women are more prone to develop cardiovascular disease in later life. 19 HETE is an analogue of 20 HETE. 20 HETE is produced in response to angiotension II and is a potent vasoconstrictor. 19 HETE blocks the vasoconstrictor effect of 20 HETE in renal and cerebral arteries. The raised level of 19 HETE in women with PCOS needs to be further investigated to ascertain whether it's high level might be conferring some kind of anti-inflammatory action.

This is the first time that oxylipins have been analyzed in women with and without PCOS. More studies need to be done to determine whether EET’s HETE’s have any role to play as markers in PCOS.