Therapeutic Potential of Sodium Selenite in Letrozole Induced Polycystic Ovary Syndrome Rat Model: Targeting Mitochondrial Approach (Selenium In PCOS)

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ABSTRACT

BACKGROUND:
Polycystic ovary syndrome (PCOS) is the most common endorinopathy in fertile women with heterogeneous reproductive and metabolic phenotypes and unknown etiology.

OBJECTIVES:
This study was undertaken to investigate the beneficial effect of selenium in management of letrozole induced PCOS and its role in modulating mitochondrial dynamics, and its associated signals.

METHODS:
Twenty four adult female rats were enrolled and randomly divided into four equal groups; control group received 0.5% w/v carboxymethyl cellulose (CMC); PCOS group received letrozole (1 mg/kg, daily) in 0.5% CMC for 21 days. From day 22 to day 36, after letrozole PCOS induction, the (PCOS +Metformin) group received metformin (2 mg/kg, daily) while (PCOS + sodium selenite) group received sodium selenite (0.1 mg/kg, daily). All doses were given via oral gavage.

RESULTS:
At the study end, serum hormone levels, lipid profile and HOMA-IR were assessed. Ovaries were dissected, used for histopathological evaluation, immunohistochemical detection of B-cell lymphoma-2 (Bcl-2), and its associated X protein (Bax) expression, measurement of redox status, mitochondrial dynamics markers and citrate synthase (CS) activity. Furthermore Mitofusins 2 (Mfn2) and dynamin related protein 1 (Drp1) mRNA expression was assessed by real time PCR.

CONCLUSION:
Selenium treatment of PCOS rats succeeded, comparable to metformin, to greatly improve the PCOS associated endocrine and metabolic phenotypes and histopathological changes, mostly through modulating mitochondrial dynamics, anti- apoptotic action, alleviating oxidative stress and mitochondrial dysfunction. So, selenium could provide a novel therapeutic strategy for PCOS.

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