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Phytosterols isolated from *Aloe barbadensis* Mill., restore reproductive and metabolic complications in Letrozole-induced PCOS mouse model

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Statement of the Problem: Polycystic Ovary Syndrome (PCOS) is a multifactorial reproductive disorder which affects 4-12% of women and is a leading cause of female infertility worldwide. PCOS is related to dyslipidemia, hyperandrogenism and hyperinsulinemia. Treatment of these dysfunctions is by administration of steroid analogues and insulin sensitizers. However, the use of these synthetic drugs gives rise to severe side effects. Hence, there is an immediate pre-requisite of an alternative herbal therapy. The purpose of this study is to understand the role of phytosterols isolated from *Aloe barbadensis* Mill., towards management of PCOS.

Methodology & Theoretical Orientation: Aloe vera gel was extracted used petroleum ether and the extract thus obtained was fractionated using silica gel column chromatography. Phytochemical screening, thin layer chromatograph, HPTLC and GC/MS were done to characterize the obtained phytosterols. Letrozole (0.5 mg/kg body weight) induced PCOS mouse model was fed orally with the isolated phytosterol for 60 days. After completion of the treatment, several metabolic as well as reproductive parameters were evaluated.

Findings: Detailed phytochemical screening demonstrated the presence of several phytosterols such as beta-sitosterol, stigmasterol and campesterol. Upon treatment with the isolated phytosterols, letrozole induced PCOS mouse model showed an improvement in the glucose sensitivity, restored lipid profile and estrus cyclicity, decreased the serum testosterone levels and increased the serum progesterone and estradiol levels. The animals also exhibited disappearance of the peripheral cysts, which is a hallmark of PCOS. The phytosterols elicit their effectiveness by getting bio-transformed into oxysterols, which can further influence molecular pathways that mainly regulate steroidogenesis and lipid metabolism.

Conclusion & Significance: This study is first of its kind which demonstrates the direct effect of phytosterols isolated from Aloe vera gel at molecular level towards management of PCOS, thereby, adding to its overall potential and economic viability at national and international level.

Biography

Arpi Dey is currently a PhD student at the Department of Biochemistry, The Maharaja Sayajirao University of Baroda, India. She has been extensively trained in the domain of reproductive endocrinology. She has contributed greatly to the development of novel herbal therapeutics by exploring the knowledge of Indian heritage of Ayurveda. She has expertise in animal handling, phytochemistry, molecular biology and cell-culture techniques.

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