



RESEARCH ARTICLE

RELIEVING EFFECT OF METFORMIN ON HYPOTHYROIDISM ATTENDANT POLYCYSTIC OVARY IN RAT MODEL

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Present investigation was undertaken to study the relieving effect of metformin on hypothyroidism attendant polycystic ovary in rat model. Fifty female Sprague-Dawley strain rats were divided into five groups (10 rats each): water control group, oil control group, dehydroepiandrosterone (DHEA) group, metformin group and DHEA + metformin group. Serum levels of total triiodothyronine (tT3), total thyroxine (tT4), thyrotropin (TSH), follicle stimulating hormone (FSH), luteinizing hormone (LH) and prolactin (PRL) were analyzed after 30 days of injection. DHEA group exhibited PCOS and hypothyroidism but significant amelioration was demonstrated in Met + DHEA group. It was concluded that metformin can relieve PCO and improve the thyroid gland functions.

Key words: Hypothyroidism, Polycystic ovary, Metformin, Dehydroepiandrosterone.

INTRODUCTION

Polycystic ovary syndrome (PCOS) is a well-known endocrine disorder concerning the reproductive women. It is commonly related to anovulatory infertility (Zhang *et al* 2015). It is a multifaceted, heterogeneous disorder of indefinite causes and there is a strong proof to be categorized as a genetic disease (Kanagavalli *et al* 2013). Thyroid gland dysfunction which is manifested as hypothyroidism, is an universal disorder and has been described in PCOS patients (Nagarathna *et al* 2014). The clinical features of hypothyroidism also include weight gain, menstrual irregularities and infertility and an association has been reported between PCOS and hypothyroidism (Walters *et al* 2012). Most of the times, hypothyroidism is subclinical and diagnosed first time during the evaluation of PCOS (Dahiya *et al* 2012). DHEA which is an androgen of mainly adrenal origin is often raised in women with PCOS. Therefore, DHEA has been used to induce PCOS in various rodent models (van Houten *et al* 2012). Currently, the investigators

have been found the optimistic action of metformin on both reproductive and metabolic aspects of PCOS. But, the mechanisms underlying the positive actions of metformin in the management of PCOS stay partly unstated (Paoli *et al* 2013). Recently, several researches have stated a reduction in TSH levels tracking the management by metformin in patients of PCOS (Pappa and Alevizaki, 2013). In this study, the effect of metformin was tested for relieving and protective effect against PCOS and hypothyroidism in rats.

Materials and Methods

All drugs and chemicals were obtained from sigma chemical company (St Louis, USA).

Animals

Fifty female Sprague-Dawley strain rats (weighing 130-150 g) were obtained from animal house of National Organization for Drug Control and Research (NODCAR), Cairo, Egypt. Vaginal smears were taken for at least 2 estrous cycles to eliminate non-cyclic animals. Animals