RESEARCH PAPER

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Gender dependent effect of adrenaectomy on the energetics in the epididymis of male and uterus of female albino rats (*Rattus norvegicus albinus*)

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A decrease in the levels of glucose, glycogen and the activity of succinate dehydrogenase (SDH) along with an increase in the levels of lactate, pyruvate and the activity of lactate dehydrogenase (LDH) was observed in the epididymis of male and uterus of female rats on adrenalectomy (ADX) when compared with sham operated (SO) rats at days 15 and days 30 of experimentation. These results indicated suppression of oxidative metabolism and elevation of anaerobic glycolysis in the reproductive tissues of the male and female rats on adrenalectomy leading to the decrease in their energy levels. The magnitude of decrease, however, was significantly more in the uterus of female ADX rats than in epididymis of male ADX rats. And in both the animal groups the degree of decrease in the level of energetics was more at days 30 than at days 15. The over all results suggest that the impact of adrenalectomy on energetics was more in females than in males and it increases with the duration of experimentation.

Key words : Albino rats, Adrenalectomy, Epididymis, Uterus, Energetics.

INTRODUCTION

The classic endocrine glands are the pituitary, adrenals, thyroid, parathyroids, pancreatic islets, gonads and placenta. Adrenal gonadal interaction appears to depend upon overlapping function of the steroid hormones, relationship between reproductive function, stress and a variety of other mechanisms (Goncharov *et al.*, 1984). The process of reproduction is a complicated and intricately synchronized phenomenon. The organs that take part in this mechanism will function perfectly in co-ordination with each other. Carbohydrates one of the major sources of immediate energy is essential for the reproductive activities (Gillian and Bell, 1982). The involvement of carbohydrate metabolism in the supply of energy to the reproductive process depends on the level of gonadotrophins and gonadal hormones (Venkata Reddy *et al.*, 2007). The existing literature indicates that ADX have influence on the hormonal integration of the body involving changes in the blood constituents and also tissues constituents. The changes witnessed in the hormonal and biochemical profiles of the serum during adrenalectomy might exhibit changes in the reproductive system and reproductive performance of animals.

Epididymis is an important organ in the male reproductive system. It provides conducive microenvironment by rapidly eliminating the harmful metabolic byproducts and free radicals (Hinton *et al.*, 1996). Epididymal spermatozoa are extremely vulnerable to oxidative stress. To overcome this problem epididymis has a rich source of an antioxidant enzyme that scavanges any excess reactive oxygen metabolite released by spermatozoa during epididymal transit (Dacheux *et al.*, 2003). Principal cells have been shown to be actively involved in the physiological functions of the epididymis involving in endocytosis, secretion and degenerative changes in epididymis of ADX rats (Nair *et al.*, 2002).

The uterus is an estrogen dependent organ and its structure and function dramatically changes with estrogen (Hadley, 2000). Uterus plays an important role in regulation of ovarian function and maintenance of normal reproductive cyclicity. Uterine weight decreased in ADX rats (Venkata Reddy *et al.*, 2007). But, the effect of adrenalectomy on the energetics in the uterus and epididymis are not well reported. Hence, the present study is taken up to understand the impact of adrenalectomy on energetics in different sex of rats at different experimental days on those tissues.

MATERIALS AND METHODS

Healthy Wistar strain male and female albino rats (*Rattus norvegicus albinus*) of the age of 120 days and body weight 220±10g have been selected for present study. The selection of albino rats is based on their ability of survival, more withstanding capacity in a fairly wide range of stress conditions and easy maintenance and handling. The stock of the litters was obtained from Indian Institute