The Asian Journal of Animal Science (June to November, 2009), Vol. 4 Issue 1 : (1-5)

RESEARCH PAPER

A comparative study on the protein metabolism and histology of the reproductive tissues in albino rat (*Rattus norvegicus albinus*) on adrenalectomy

M. VENKATAREDDY AND K. RADHAKRISHNAIAH

Accepted : January, 2009

ABSTRACT

A significant decrease in the levels of total proteins along with an increase in the levels of free amino acid (FAA) and ammonia and activities of protease, alanine aminotransferase (AlAT), aspartate amino transferase (AAT) and glutamate dehydrogenase(GDH) were observed in the penis of male and vagina of female rats on adrenalectomy (ADX) at day 15 and day 30 compared to sham operated (SO) rats. These changes indicated active proteolysis and trans-deamination in the reproductive tissues of rats on adrenalectomy. The magnitude of the changes were significantly more in the vagina of female ADX rats than in the penis of males. Longer the duration of adrenalectomy more the protein breakdown in both the sexes as noticed from day 15 to day 30. Corresponding to the changes in protein levels, some degenerative changes in the histology were observed in the penis and vagina of ADX rats at day 15 day 30 compared to normals. A mild damage was seen in areolar connective tissue and elastic fibres of penis at days 15. On days 30, the three erectile tissues of penis overlapped with irregular arrangement with the congestion of areolar tissue. On 15 days of ADX female rats, the vagina showed less number of leucocytes and wide spaces appeared between elastic fibres of fibrosa. On day 30 the vagina exhibited the pressence of very less number of leucocytes in mucous while the elastic fibres of muscularis mostly disappeared. The observations indicated proteolysis and active trans-deamination in the reproductive tissues of rats on adrenalectomy. It could lead to structural disruption and decreased reproductive ability.

See end of the article for authors' affiliations

K. RADHAKRISHNAIAH

Department of Zoology, Sri Krishnadevaraya University, ANANTPUR (A.P.) INDIA

Key words : Albino rats, Adrenalectomy, Histology

The classic endocrine glands are the pituitary, adrenals, thyroid, parathyroids, pancreatic isletes, gonads and placenta. Apart from that adrenal gland is an important endocrine gland which secretes hormones concerned with carbohydrate, proteins and lipid metabolisms, balance of electrolytes in blood, maintenance of circulatory blood volume, control of sexual maturity and regulation of extracellular fluid volume. Adrenal gonadal interaction appears to depend upon overlapping function of the steroid hormones of the adrenal gland and gonads on the reproductive organs and stress operated mechanisms as reported by 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.

Any stress on an animal invokes compensatory metabolic adjustments in its organs through modification and modulation of the quality and quantity of various biochemical constituents and enzymes (Assem and Hunke, 1983). Removal of gland would deprive the organism at various levels if its normal source of hormones are not available. Measurable abnormalities appear in the individual during its life history. Thus, bilaterial removal of adrenal gland to a number of metabolic disturbances which are identical with those appearing in patients with Addison's diseases, such as extreme muscular weakness, a variable degree of hypoglycemia, ceased growth in young animals, loss of body weight, electrolyte imbalance and decreased reproductive function (De GRoot and Jameson, 2001). Adrenal gland is an important role in the maintenance of the penile erection and also which is an androgen- dependent organ (Mills *et al.*, 1996). If any deficiency of adrenal hormone can lead to failure of penile erection in ADX rats (Penson *et al.*, 1997). Vagina is also estrogen dependent organ that undergoes a drastical changes in the cells during estrous cycle in ADX rats (Venkata Reddy *et al.*, 2007). Several reports though are available on the general impact of adrenalectomy but very little information is available on the protein levels and histological changes of reproductive tissues. Therefore, the present work is aimed to understand such changes in the reproductive tissues of male and female adrenalectomized rats in order to correlate them to implication of Addison's disease.