RESEARCH PAPER

EFFECT OF ANGIOTENSIN RECEPTOR BLOCKER (CANDESARTAN) ON CHRONIC FATIGUE SYNDROME IN MICE

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The present study was aimed to explore the role of AT_1 receptor blocker (candesartan) in the management of chronic fatigue syndrome. Swiss albino mice (either sex; 6-8 weeks and 20-30 g) were used in this study. Chronic fatigue was induced in mice by two different methods: (i) exposing the mice to forced swimming daily for 10 min for 21 days; (ii) administration of single dose of LPS (1 mg/kg; *i.p.*) to mice followed by forced swimming daily for 10 min for 21 successive days. Candesartan was administered daily in 2 doses (1 and 2 mg/kg; *i.p.*) to mice for 21 successive days. Behavioural assessment such as immobility time, elevated plus maze (for memory), elevated zero maze (for anxiety), open field (for ambulation) and tail-immersion test (for stress induced hyperalgesia) were used to evaluate the induction of fatigue. After behavioural evaluation, blood glucose, blood cortisol, brain TBARS and GSH levels were also estimated. Administration of candesartan significantly ($p<0.05$) reduced the immobility time of mice as compared to control group. Further, administration of candesartan significantly ($p<0.05$) prevented memory impairment, exerted anxiolytic activity and reduced hyper sensitivity to pain of mice. Candesartan treated mice showed significant ($p<0.05$) reduction in blood cortisol levels as compared to FS control group however, enhanced the cortisol levels compared to LPS control group. Candesartan treated mice showed a significant ($p<0.05$) increase in GSH and decrease in brain TBARS. Thus, candesartan may prove to be a useful remedy for the management of chronic fatigue syndrome.

Key words: Angiotensin-receptor blocker, Candesartan, Chronic fatigue syndrome, Oxidative stress.

INTRODUCTION

Chronic fatigue syndrome (or CFS) is a disease characterized by prolonged fatigue for a period of six months or longer that is not improved by taking rest and may be exacerbated by physical or mental activity (Wessely, 2001). CFS results from a variety of stress conditions, such as prenatal stress, early life stress, physical stress, mental stress, emotional stress and stress caused by bacterial endotoxin. The illness occurs most often in people aged 40-59 and it occurs more frequently in women than in men. The condition affects an estimated 42 persons out of

every 10,000 (Jason *et al* 2005). The symptoms of CFS may include physical and mental exertion, cognitive impairment, disturbed sleep patterns, musculoskeletal pain, sore throat and headaches (White, 2010). The causes of CFS are immune system abnormalities and chronic immune activation, dysfunction of the hypothalamic-pituitary-adrenal (HPA) axis, brain abnormalities, sleep disorders, emotional stress (comprising host aspects) and infections, for example, various microbial infections (Epstein-Barr virus, enteroviruses, parvovirus B19, *Coxiella burnetii* and *Chlamydia pneumoniae*),