UNIVERSITI TEKNOLOGI MARA

EFFECTS OF CORTICOSTERONE ON THE ESTROUS CYCLE OF FEMALE RAT

SYAHIRA AFIQAH BINTI MOHAMAD PAUZI

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ABSTRACT

Female who reached the puberty age will undergo normal physiological process which is menstruation. However, menstrual disorders such as menorrhagia, pre-menstrual syndrome, oligomenorrhea and amenorrhea are commonly related to psychological stress. Prevalence of menstrual disorder associated with stress was 34.6% (Ekpenyong, et al., 2011). There is direct association between stress and prevalence of menstrual disorder.

Corticosterone is a stress-related hormone which released by endocrine system when subjected to stress. Stress can give various adverse effects on female menstrual cycle such as irregularity of cycle, prolong the bleeding duration and missed periods (Fenster et al., 1999). This study was conducted using corticosterone, which is a type of steroid hormone produced by adrenal cortex. High stress level due to greater secretion of corticosterone aggravates the activity of hypothalamus-pituitary adrenal (HPA) axis (Rabine et al., 1990). This study emphasized on the effect of corticosterone on the estrous cycle of female rat. The method for determination of the estrous cycle was through observation of cells obtained from vaginal smearing. Result obtained from 18-day duration of cell's observation showed that corticosterone (25 mg/kg) led to prolongation of estrous cycle from 4 days in the controlled group to 5-7 days in the experimental group.

CHAPTER 1

INTRODUCTION

1.1 Background of study

Corticosterone has important function in human brain function, which circulates at 10-20 times lower concentration than cortisol, the principal human glucocorticoid. Total active glucocorticoids in human cerebrospinal fluid comprised of about 40% corticosterone (Raubenheimer et al., 2006). The determination of rodent plasma corticosterone and plasma cortisol can be used as biomarker for rodent activation of stress (Gong et al., 2015).

The animals which undergo frequent handling have lower stress level compared to the rarely handled animal (Yap et al., 2014). The level of glucocorticoid increases sharply as the response to chronic stress and lead to stimulation of negative immune response (Kiank et al., 2010). Glucocorticoid is a distinct mediator of stress in which the immunosuppressive properties are resulting from the harmful impacts of chronic stress (Elenkov, 2004).

Fertility is defined as the ability of the organism to have offspring while infertility may be caused by several problems that affect the reproduction. The body will activate endocrine system to release a stress-related hormone such as corticosterone when exposed to stress (Koopman, 2013). Stress can give impact on the female menstrual cycle. Stress will activate corticotropin-releasing hormone, which may