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HORMONAL CHANGES IN MALE BISPHENOL-A TREATED SPRAGUEY DAWLEY RATS AT DIFFERENT TIME RESPONSE

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ABSTRACT

The effects of Bisphenol-A (BPA) on hormonal changes in juvenile male *Sprague–Dawley* (SD) rats at different time response (7, 14 and 28 days) of treatment was observed in this study from PND28-56. In this study nine groups were prepared for BPA, ethinyl estradiol (EE) and Tween-80 in distilled water (1:9v/v) treatments on three different duration of time. Three groups of rats were administered orally with 100 mg/kg body weight of BPA. Another three groups of rats were administered orally with 10 mcg/kg body weight of EE. Control group was administered with the vehicle of Tween-80 with corn oil (1:9 v/v). The observations and analysis made in this study was the changes of the testosterone hormone levels for BPA, EE and control groups at 7, 14 and 28 days.. Statistical analysis by two-way ANOVA showed that treatments at different time response has significantly ($p<0.05$) influence the testosterone levels. Modifications in the circulating testosterone levels were observed after treatments. Testosterone was reduced in testosterone levels of the juveniles, both with BPA and EE compared to control groups. The level of testosterone concentration for BPA and EE groups were lower than negative control group while testosterone level for BPA group was lower than EE group. This can be due to the much higher estrogenic potency of EE; the potency of BPA is approximately 10 to 1,000-fold less than that of EE. The testosterone levels were low for 7 days treatment (93.78 ± 14.51 pg/ml) and higher for 14 days treatment (159.91 ± 26.63 pg/ml) compared to 28 days treatment (149.84 ± 36.95 pg/ml). Statistical analysis by one-way ANOVA at p-value=0.05 shows there were no significance mean difference of testosterone levels between 7, 14 and 28 days treatment. Testosterone levels were significantly highest in negative control group (184.4638±35.79038 pg/ml), followed by positive control group (156.9857 ± 22.03493 pg/ml) and the lowest in BPA-treated group (62.0767±15.25640 pg/ml). There were significant differences of testosterone levels between BPA, EE and control groups.

CHAPTER 1

INTRODUCTION

1.1 Introduction

Today millions of young and old men suffer from disorders related to hormone imbalance due to high levels of estrogen in our diet and the environment. Estrogenic environmental chemical Bisphenol-A (BPA) or also known as endocrine disruptors are naturally occurring compounds or man-made chemicals that may interfere with the production or activity of hormones of the endocrine system. An endocrine disruptor is defined as an exogenous agent that can interfere with the synthesis, secretion, transport, metabolism, binding, action, or elimination of natural blood-borne hormones in the body that are responsible for homeostasis, reproduction, and developmental processes (Kavlock and Ankley 1996).

BPA can lead to adverse health effects. Based on previous studies, there are over 6 billion pounds per year of the estrogenic monomer BPA being manufactured as polycarbonate plastic products, in resins lining metal cans, in dental sealants and in blends with other types of plastic products(Akaue *et al*,. 2001). BPA is an organic compound with two phenol functional groups. The ester bond linking BPA molecules in