

Study the effect of electromagnetic field on cortisol hormone some biochemical and hematological parameters in adult female rabbits

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Abstract

This study was investigated the effects of static magnetic field (SMF) on the serum cortisol hormone, biochemical and hematological parameter in 12 mature female rabbits, six of them were exposed to electromagnetic field of 104 μ T for 30 minutes twice daily for 15 days. The other six female rabbits served as control. Blood samples were collected from treated and control rabbits. Results revealed that there were significant ($p < 0.05$) increase in triglycerol, high density lipoprotein (HDL), and total WBC count. There were significant ($p < 0.05$) decrease in serum total protein, albumin, globulin, serum cholesterol, low density lipoprotein (LDL), glucose, and cortisol hormone. statically magnetic field also caused significant decrease in RBC count, PCV% and Hb concentration.

Key words. Electro magnetic field, female rabbits, cortisol, biochemical and hematological.

Introduction

The effect of electromagnetic field on the live microorganisms seems to be very complicated (7). The initial effect of electromagnetic field is to actuate the key biochemical processes in different metabolic pathways (6), due to daily exposure of electromagnetic fields produced by electrical devices, it's important to study various biological effects of different electromagnetic fields. previous studies show that only some electromagnetic fields could interact with an electrical fields of human body and may cause some physiological changes (2), it penetrate the animal body and act on all organs, altering cell membrane potential and the distribution of ions and dipoles (4), and these alterations may influence biochemical processes in the cell, thus changing both biochemical parameter and enzyme activities of serum (16). Numerous biochemical studies on human and animal which exposure to MF have showed that significant disturbances in the

metabolism of carbohydrate, lipid and protein reflected by altered blood glucose levels and by accelerated glycolysis and glycogenolysis (12,13), it is known to be strongly lipolytic and glycogenolytic in rats (5,9), inducing a prominent increase in blood cortisol level. Also, several studies have demonstrated that MF may increase in risk of various type of cancer, including leukemia, brain and breast tumor, the characteristic biological effect of MF appear to be functional changes in central nervous system, endocrine and immune system (1,14). Moreover many reports indicate that magnetic field is involved in cancer induction as a co carcinogenic factors able to be enhance the effect of other mutagenic substances (3). This study aimed to detect the effect of the electromagnetic field exposure of mature female rabbits on cortisol hormone and some biochemical parameters in addition to some hematological parameter.

Materials and methods

Twelve adult female rabbits, their mean body weight was 2 -2.5 kg; were housed at the animal house of the college of veterinary medicine at similar conditions at room temperature as each two animals in one cage under normal periods of light/dark with free access of

food and water. They were randomly divided into two experimental groups of six animals for each. First group was severed as controls and the others were exposed to electromagnetic field. The intensity of magnetic field was measured and standardized at 104 μ T and influx