Body temperature in the rat exposed to X–ray from electromagnetic waves

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ABSTRACT

The objective of this study was to measurement of the body temperature in the rat after expose X–ray from electromagnetic waves. Electromagnetic waves in veterinary medicine are used for different purposes. Spectrum of this radiation include x-ray beam that are used in imaging and treatment. Numerous studies have pointed to the impact of these waves. This radiation effects on metabolism and body temperature. In this study the changes in body temperature before and after expose x-ray beam was recorded. X-ray study shows the impact of it on the temperature in the rats and it appears in this study with X-ray expose in these animals is reduced body temperature. Mean of the temperature in before and after expose were 34.91±0.36, 33.26±0.51 centigrade degree respectively. Compared to the average temperature of the radiation beam in rats were significantly different.

Key words: Body temperature, Electromagnetic waves, X-ray.

Introduction

Changes in body temperature in animals and humans are important because these effect on physical activities. Body temperature is caused by some interactions [3, 13,21]. Electromagnetic waves in veterinary medicine are used for different purposes. Spectrum of this radiation include x-ray beam that are used in imaging and therapeutic applications [4, 5,19]. Numerous studies have pointed to the impact of these waves [1, 7, 14, 20]. This radiation effects on metabolism and body temperature [13,14]. Radiation effects that lead to ionization or excitation articles in living systems [5, 8, 14]. The effect of electromagnetic radiation on body temperature can have an effect on other body activities that are important in this respect [1, 11, 21].

Laboratory work and research on rats and another animals with different types of electromagnetic waves is done [1,2,10,11,12,18]. Many reports have been published effect of electromagnetic irradiation on body temperature [6,7,12,13]. In a study, body temperature of mouse can be changed but it unknowingly and not pathological [13]. But in another research with electromagnetic waves effect on rectal temperature has been not seen [16].

The objective of this study was to measurement of the body temperature in the rat after expose X–ray from electromagnetic waves.

Materials and Methods

Six clinically normal Wistar rats (3 female and 3 male), weighted 250-300 g were used in this study. Animals were restricted by physical ways. The animals were kept under similar nutritional and environmental Conditions. Restrain operation was carried inside special cages.

A suitable thermometer (SANITAS name with an accuracy of one tenth °C) was used to measure body temperature rectally in this animal. Animals positioned in the abdominal recumbency inside cages. Animals were irradiated with X-ray and expose conditions were 40 kvp and 10 mAs. After the initial radiation exposure time at 5, 10, 15 and 20 seconds were repeated immediately.

In this study, X-ray machine was PHILLIPS, MEDIO 50CP-H model. Measurements were taken as standard way from rectal. Measurements were done in before and immediately after of exposer. All temperatures were measured in a minute. Body temperatures were noted in the table. Data obtained were mentioned as mean± standard deviation and achieved data were analyzed by Mann-Whitney and ANOVA tests in SPSS ver.17.

Results:

The objective of this study was to measurement of the body temperature in the rat after expose X–ray from electromagnetic waves.
The mean of obtained data in animals before and after the radiation beam are shown in Table 1 and Graph of the mean body temperature at before expose and after expose is shown in graph 1.

Table 1: The mean body temperature of animals at before expose and after expose.

<table>
<thead>
<tr>
<th>Time</th>
<th>No</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before expose</td>
<td>6</td>
<td>34.91±0.36</td>
</tr>
<tr>
<td>After Expose</td>
<td>6</td>
<td>33.26±0.51</td>
</tr>
</tbody>
</table>

Graph 1: Graph of the mean animals body temperature at before expose and after expose

Discussion:

Animals can be used such as experimental model in show effects of irradiation special in X-ray usage [2,10,11,12,16,17]. Electromagnetic waves in veterinary medicine and medicine are used for different purposes. Spectrum of this radiation include X-ray beam that are used in imaging and treatment [4,5,19]. Numerous studies have pointed to the impact of these waves [1,7,14,20]. This radiation effects on metabolism and body temperature therefore the waves play an important role in life [3,8,13,14].

This survey pointed out that expose of x-ray has effect on body temperature in rat. In this study the changes that body temperature before and after expose X-ray beam was variable.

X-ray study shows the impact of it on the temperature in the rats and it appears in this study with X-ray exposure these animals is reduced body temperature.

Mean of the temperature in before and after expose were 34.91±0.36, 33.26±0.51 centigrade degree respectively. Compared to the average temperature of the radiation beam in rats before and after expose X-ray beam were significantly different (p> 0.001).

That align with some of the reports in this field but also inconsistent with another papers. Failure to comply can related to this type of radiation, kind, frequency, spectrum of the waves ,climatic conditions and other involved factors [7,9,13,17].

X-ray study shows the impact on the temperature in the rats is existence [13,14] and this study, which appears in several X-ray radiation is reduced body temperature the animals.

Compared to both the average temperature of the radiation beam with the significant difference was seen and this indicates side effect of X-ray irradiation.

Compared to the average temperature of the radiation beam in two groups of male and female subjects (35.20±0.26, 34.63±0.15 centigrade degree respectively) before of the expose were not significantly different. So, this study suggests no difference in male and female average temperatures in before of the expose but a very little different in this groups were observed in after of expose(33.73±0.05, 32.80± 0.10 centigrade degree respectively). That can be rule of gender-related factors.

Finally can be said, the effect of electromagnetic radiation on body temperature can have an effect on the temperature that are important in this respect.

References

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