THE FEATURES OF CREATING A COMBINED MODEL OF ENDOMETRIOSIS AND ALLOXAN INDUCED DIABETES IN RATS

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Introduction

Endometriosis and type 1 diabetes mellitus (T1DM) are common diseases adversely affecting quality of life and reproduction. The incidence of both has been growing recently. Clinical features and an influence of endometriosis therapy on glycemic status of co-morbid endometriosis and T1DM patients has not been widely explored. Preclinical experiments on rat models are a key for studying the interaction of medication for both diseases. However, the researches of co-morbid endometriosis and T1DM are absent. Thereby a creation of experimental co-morbid endometriosis and T1DM rat model is an essential tool for development of new therapeutic approaches of these disorders.

Materials and methods

The experiment was conducted in FGBNU "Institute of Obstetrics, Gynecology and Reproductive Medicine named after D. O. Ott" St. Petersburg. First endometriosis was surgically induced in sixty-two Wistar rats weighing 200±50 g in estrus cycle by implant fixation on external surface of front abdominal wall subcutaneously. Two weeks later after the first surgery diabetes was induced by single intraperitoneal 150 mg/kg alloxan administration. If endometriosis loci were not visualized in rats those were used as a control group with saline injection. After diabetes confirmation and its differential diagnosis with type 2 diabetes; the group of rats concomitantly recapitulated endometriosis and T1DM had 4-week insulin therapy after which histological verification of endometriosis was held.

Descriptive statistics with median and standard deviation evaluation was used. Significant difference between two independent means was calculated using Student's t-test at 0.05 level. Statistical significance was considered whenever the P value was less than 0.05.

Results

The research demonstrated that glucose levels were 25.2 mmol/l ±5.2 mmol/l in groups of endometriosis + T1DM and were significantly higher compared with 7.4 mmol/l±2.3 mmol/l in a control group ($p<0.05$). Figure 1.
7% of rats with alloxan injection had insulin-independent diabetes, that was verified by detecting low levels of ketone bodies (lower than 1.5 mmol/l).

Histological verification of endometriosis was in 60% of rats passed two stages of the experiment. Mean area of endometrioid implants was 12±2,5 mm2. Mortality of animals was high, 76%.

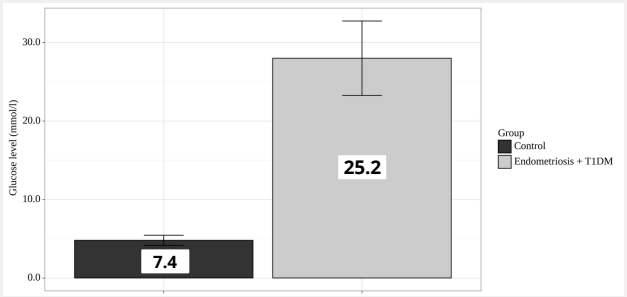
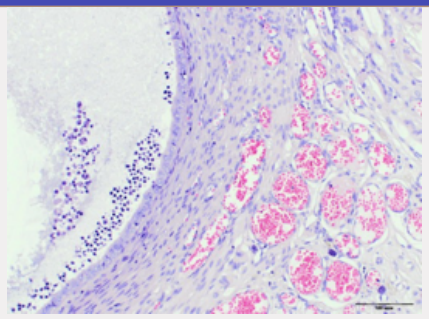


Figure 1. Glucose level in blood in the comparison groups



Histological verification of endometriosis

Conclusion

Noteworthy, it took 3 years from the beginning with an idea of the model to its creation and histological verification and approbation. We succeed to make an experimental model of endometriosis and type 1 diabetes mellitus combination. This model can be used in research of the disorders interaction and restrictions of endometriosis therapeutics usage in patients with T1DM as well as for evaluation of new treatment approaches.