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LS-5-P-3341 The effects of endoplasmic reticulum stress on the morphology of the ovarian follicles of mice.

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In eukaryotic cells, several pathways have evolved independently to ensure the integrity of the protein-folding environments in the endoplasmic reticulum (ER). The ER is the cellular organelle for synthesis, folding, and maturation of most secreted and trans membrane proteins. Processes that disturb protein folding may also cause accumulation of unfolded proteins in the ER leading to ER stress. Zona pellucida is a glycoprotein, which synthesized in ER of the ovum. It is a very important layer in the cellular relationship between ovum and follicular cells. In addition, it plays a significant role in follicular development. We used Tunicamycin (TM), which is an antibiotic that induces the ER stress. It blocks the synthesis of all N-linked glycoproteins and we studied its effects on the structure of zona pellucida and the morphology of the mice ovarian follicles. There were 24 C57BL/6 young female mice that weighed between 10-25g. We split them into three groups each having 8 mice. The control group had intraperitonial (IP) injection of basic water (pH 9) twice in each week. The other two groups were the experimental ones of 1 and 2. The first experimental group had IP injections of 5 µg of TM in 0.1ml of basic water for two weeks. The second experimental group had the same dose of TM twice per week for four weeks. We stained the histological sections with H+E, PAS+Masson and PAS+H. We used immunohistochemistry and Western blot methods to evaluate the effects of cellular stress on the morphology of the ovarian follicles. According to the anti-GRP/BiP immune reaction, the TM induced ER stress was comparatively expressed most in the first experimental group. The ER stress expression in the second experimental was relatively less than that of the 2 week group, but close to that of the control group. Immunohistochemistry and Western blot results also show low levels of ZPGs in first experimental group but high levels of ZPGs in the second experimental and control groups. Appropriate histomorphometric methods were also used to support the data. P -values for Zona pellucida and number of granulosa cells surrounding the oocytes in secondary follicles were found to be statistically significant among the groups. Consequently, it was concluded that tunicamycin induced cellular stress, and has a negative effect on the morphology of the mice ovarian follicles. REFERENCES 1. Sato E, at all.: Microscopy Research And Technique. 2006;69:427-435. 2. Liang LF, at all.: Mol. Cell. Biol. 1990, 10(4): 1507. 3. Hoodbhoy T, at all.: MCB. 2006; 26(21): 7991-7998. 4. El-Mestrah M, at all.: Biol. Reprod. 2002; 66: 866-876. 5. Schr'odera M, at all.: Mutation Research. 2005; 569: 29-63. This present work was supported by the Research Fund of Istanbul University. Project No. 23471