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The Effects of Unilateral Testicular Torsion upon Immunity Modulation and Apoptosis of Germinal Cells in the Contralateral Testis. An Experimental Study in Rats

Abstract

Since the report of Kuarup in 1978, deteriorating effects of unilateral testicular torsion to the contralateral testis are generally accepted, but the mechanism of the damage remains controversial. This study aims to explain the mechanism of spermatogenesis disorder of the contralateral testis after unilateral testicular torsion that underlies infertility. This study used 40 Wistar strain Rattus norwegicus white rats divided into 4 groups of 10 rats each with a post test control group design. Two groups of white rats were subjected to left sided testicular torsion three times counter-clockwise for 4 hours and 24 hours respectively, and two other groups, which served as control, were subjected to sham operation. Subsequently, the determination of serum testosterone was carried out using radioimmunoassay and investigations on the proportion of apoptosis of the germinal epithelial cells, the percentage of IL-4 producing lymphocytes and the IgG-producing plasma cells in the contralateral testis was performed by means of an immunohistochemical method. The results of multivariate analysis showed that unilateral torsion in white rats for 4 hours induced significant increase in the percentage of IL-4 producing lymphocytes in the contralateral testis, but no significant change was demonstrated in serum testosterone level, the percentage of IgG-producing plasma cells, or the proportion of apoptotic germinal epithelial cells in the contralateral testis. Unilateral testicular torsion for 24 hours could induce significant decrease in serum testosterone level along with significant proportional increase of apoptosis of the germinal epithelial cells in the contralateral testis. No significant change in the percentage of IL-4 producing lymphocyte and the IgG-producing plasma cells in the contralateral testis could be measured. It can be concluded that the mechanism of spermatogenesis disorder post-unilateral testicular torsion can be explained by the immunopathobiology paradigm. Immunity modulation was found in the rats subjected to testicular torsion for 4 hours, as reflected by an increase in the percentage of IL-4 producing lymphocytes and pathobiological modulation occurred in rats subjected to testicular torsion for 24 hours as reflected by the reduction in serum testosterone level along with an increase in the proportion of apoptosis of the germinal epithelial cells in the contralateral testis.

Keyword : testicular, torsion, testosterone, immunity, modulation, germ, cell, apoptosis, white, rats,

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