Role of TNF-Related Apoptosis Inducing Ligand (TRAIL) in Pathogenesis of Varicocele-Induced Testicular Dysfunction

Introduction and Objective: Recent investigations have reported that NF-kB (nuclear factor- kappa B) activation involves varicocele-induced testicular dysfunction. Although there are several mediators that may increase the levels of NF-kB in different pathologies, the death ligand TRAIL family, a recently discovered member of tumor necrosis factor (TNF) and evidences that TRAIL may be a further factor that stimulates NF-kB suggest that this ligand may also be involved in varicocele pathogenesis. This study was undertaken to investigate the possible role of TRAIL pathway activation in the pathogenesis of infertility in a rat model of varicocele.
Materials and Methods: Rats were divided in three groups as control, sham and varicocele. Experimental varicocele was performed by partial ligation of the left renal vein and left testes were analyzed 13 weeks after surgery. The degree of apoptosis within testis was determined using TUNEL method. Tubule degeneration was evaluated by Johnsen's score. TRAIL and its receptors' expressions were detected by immunohistochemistry and Western blot.
Results: Germ cell apoptotic index was increased in rats with varicocele when compared to sham and control groups ($p=0,0031$). The Johnsen's score was decreased in varicocele group significantly ($p<0,0001$). Immonohistochemical and Western Blot analyses showed that TRAIL-R1 and TRAIL-R4 expressions in germ cells were increased and TRAIL-R2 expression was decreased after varicocele induction. There are no significant differences among the groups in terms of TRAIL and TRAIL-R3 receptors expressions.
Conclusions: The results of this study indicate that TRAIL and its receptors have a potential role in pathogenesis of varicocele-induced testicular dysfunction.