**The improvement of reproductive disturbances in experimental varicocele rats following resveratrol supplementation**

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**Abstract**

**Introduction:** Uncontrolled production of reactive oxygen species (ROS) plays a pivotal role in male infertility especially in varicocele. The endogenous antioxidant capacity of seminal fluid is not able to counteract the detrimental effects of over-produced ROS. Recently, using of foods rich in antioxidants as adjuvant therapy or even as the only method of male infertility treatment has aroused broad attention. In this study, we evaluated the effect of resveratrol (RES), a polyphenolic compound with antioxidant activity, on the improvement of reproductive competence of experimental varicocele rats.

**Methods and materials:** Forty adult Wistar male rats were randomly divided into four groups: control (n=10), sham-operated (n=10), varicocele induction without RES treatment (VI.RES-; n=10), and varicocele induction with RES treatment (VI.RES+; n=10) groups. Varicocele was induced by surgery. RES was given in daily dose (300mg/kg body weight; by gavage) to the animals of the VI.RES+ group, from the second month post-surgery to the end of the fourth month. Morphometric measurements of testis, epididymis length, sperm parameters (concentration, motility, and morphology), chromatin condensation (by aniline blue staining), sperm DNA damage by acridine orange staining, sperm protamine deficiency (by chromomycine A3 staining), and sperm lipid peroxidation (using the probe BODIPY) were assessed and compared between groups at 4-month endpoint.

**Results:** Our findings indicated the ameliorative effect of RES on varicocelized rats in terms of morphometric characteristics of the testis (*p*<0.05) and epididymis (*p*<0.05), sperm quantity and quality (*p*<0.001), sperm chromatin condensation (*p*=0.003), sperm DNA damage (*p*=0.001), sperm protamine deficiency (*p*=0.01), and sperm lipid peroxidation (*p*<0.001).

**Conclusion:** RES, with multi-target and multi-action characteristics, could be regarded as a novel innovative drug for the treatment of varicocele. However, human studies are required before the incorporation of this modality in routine clinical settings.

**Keywords:** Male infertility, varicocele, antioxidant, resveratrol