

Combination of Vitamin C and E Improves Spermatogenesis of White Male Rat Model of Paradoxical Sleep Deprivation Stress

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Abstract	<p>Paradoxical Sleep Deprivation (PSD) elevates glucocorticoid and Reactive Oxygen Species (ROS) levels that cause oxidative stress, trigger spermatogenic cells damage, and reduce the number of sertoli cells. Vitamin C and E are antioxidants that could prevent spermatogenesis damage by preventing free radical formation. The study aimed to determine the effect of single and combined doses of vitamin C and E in improving spermatogenesis of white male rats (<i>Rattus norvegicus</i>) model of PSD. This is experimental research with post-test only and control group design on 28 white male rats distributed into four groups, i.e. group I (control, PSD), group II (PSD+vitamin C), group III (PSD+vitamin E), and group IV (PSD+a combination of vitamin C and E). Testicular preparations were stained using Hematoxylin-Eosin staining, quantitative scores of spermatogenic cells were measured using the Johnsen method, and the number of sertoli cells was counted in 10 seminiferous tubules in each of the three testicular sections. Group I has the lowest mean of Johnsen score ($5.27\bar{A}, \bar{A}\pm 0.28$), and group IV has the highest mean score ($8.95\bar{A}, \bar{A}\pm 0.62$), while the Mann-Whitney test showed a significant difference ($p < 0.05$) between group II, III and IV compared to group I (control group). Mean sertoli cells number of group I is the lowest ($10.66\bar{A}, \bar{A}\pm 1.04$), and group IV has the highest sertoli cells number. The post-hoc LSD test showed a significant difference ($p < 0.05$) between group IV and the other groups. Thus, the combination of vitamins C and E improves Johnsen score and sertoli cells number of male rats (<i>Rattus norvegicus</i>) experiencing PSD.</p>
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