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The Impact of Co-Administration of Phosphodiesterase-5 Inhibitor and Sodium Selenite on Ischemia/Reperfusion Injury in a Rat Ovary Model: Biochemical and Histopathologic Evaluation

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Abstract : Aim: To study the effects of co-administration of phosphodiesterase-5 inhibitor (PDE-5) and sodium selenite against the damage induced by ovarian ischemia-reperfusion in rats. Materials and Methods: A total of forty-two sexually mature, virgin, female rats were divided randomly into six groups of seven each: sham group (C), ischemia group (I), ischemia/reperfusion group (I/R), ischemia/reperfusion plus 1.4mg/kg sildenafil (I/R+S) group, ischemia/reperfusion plus 0.2mg/kg selenium (I/R+Se) group and ischemia/reperfusion plus combination of sildenafil and selenium (I/R+S+Se) group. In ischemia group (I), rats were exposed to ischemia for 3 hours (h). In ischemia/reperfusion group (I/R), rats were exposed to ischemia for 3 h followed by 6 h of reperfusion. Treated groups received 1.4mg/kg sildenafil or 0.2 mg/kg selenium or both 30 min before reperfusion. Both ovaries were surgically removed carefully. One ovary was examined for histopathological changes and the other was subject to biochemical analysis including malondialdehyde (MDA), catalase (CAT) and glutathione peroxidase (GPx). Results: Assessment of ovarian tissue damage using a scoring system showed marked vascular congestion, interstitial edema, leukocyte infiltration, hemorrhage, and follicular degeneration in ischemia and ischemia/reperfusion groups. Tissue damage score for I, IR and all treated groups were significantly higher than those of the sham group ($p<0.001$), while tissue damage score decreased significantly in I/R+S and I/R+Se groups compared to I/R group ($p<0.05$), and notably, the difference was highly significant in I/R+S+Se group ($p<0.001$). There was significant increase in MDA levels and reduction in activities of CAT and GPx in I/R group compared to the sham group ($p < 0.05$). In I/R+S and I/R+Se groups, MDA was significantly decreased compared to the I/R group ($p<0.05$) and the difference was highly significant with co-administration of sildenafil and selenium ($p<0.001$). CAT and GPx were higher in all treated groups compared to I/R group ($p<0.05$). Conclusion: The co-administration of sildenafil citrate and selenium are highly protective against damage induced by ovarian ischemia/reperfusion in rats.

Keywords : phosphodiesterase-5 inhibitor, sildenafil, antioxidant, selenium, ovarian ischemia
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