Tissues, Pathology, and Diagnostic Microscopy

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Allopurinol ameloriates ischemia-reperfusion injury in ovarian torsion-detorsion subjected rats.

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Adnexal torsion is the twisting of the ovary and /or tube around its vascular axis [1]. It is a gynecologic syndrome occurs mostly in adolescent girls and in women of child-bearing age [2]. Traditional treatment has been oophorectomy for these cases while the conservative approach is detorsion of the twisted segment. Thus, circulation of the ovary can be maintained after the ischemic condition, but detorsion causes primary pathophysiologic event called “reperfusion injury” [3]. The mechanisms underlying ischemia-reperfusion injury are related with oxidative stres and neutrophil activation. The inducible form of NOS (iNOS) is expressed in pathological processes and in response to pro-inflammatory agents, which produces large amounts of NO and contributes to the pathophysiology of I/R injury [4]. Reactive oxygen and nitrogen species are produced in ischemia-reperfusion conditions, at least in part, to the activation of xanthine oxidase. Allopurinol competitively inhibits the action of xanthine oxidase and effectively counteracts oxidative stress. However, its unknown whether allopurinol can ameloriate ovarian ischemia-reperfusion injury in the adnexal torsion cases. Therefore, the aim of the present study was to investigate the protective effect of allopurinol on the ovarian histopathology, inflammation and the alterations of iNOS immunoreactivity after 24 hour reperfusion period in rat ovary.

The rats were randomly divided into 3 groups; sham, 24 h detorsion plus saline, allopurinol group. Thirty minutes before detorsion, a single dose of 200 mg/kg allopurinol was administred by intraperitoneally. Ovarian tissue samples were obtained to evaluate the histopathology and to determine iNOS immunoreactivity. Furthermore, serum myeloperoxidase activity was measured as a marker of inflammation. Histopathological alterations were shown in detorsion subjected torsioned ovary. Severe to moderate hemorrhage, edema and congestion were detected in the detorsion group and increased tissue damage score also reflected this condition. Also, detorsion caused an increase in the MPO activity. Allopurinol pretreatment effectively attenuate histopathologic alterations, reduced MPO levels, without affecting iNOS immunoreactivity. (Figures 1,2).

The results indicate that allopurinol may exert its antioxidant effect via inhibition of inflammation as well as direct radical scavenging role in this model. However, detailed experimental studies are needed to elucidate the inhibitor effects on iNOS activity.

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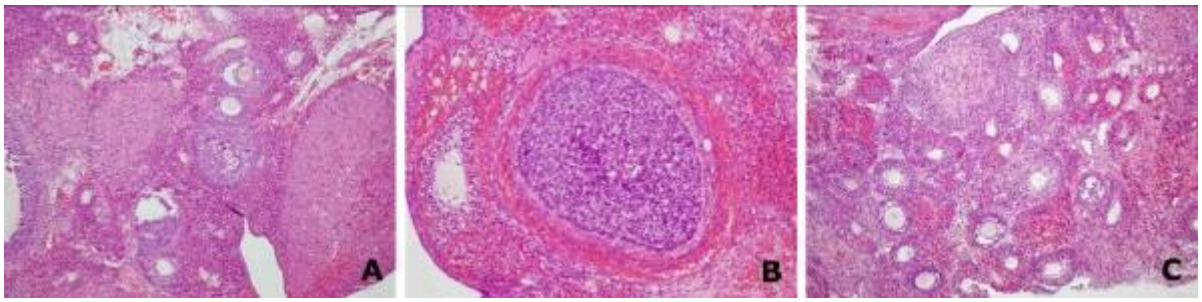

Figure 1. Photomicrographs of the histological examinations of the rat ovarian tissues. (A) Control, (B) Detorsion, (C) Detorsion+Allopurinol. Hematoxylin-eosin; X10.

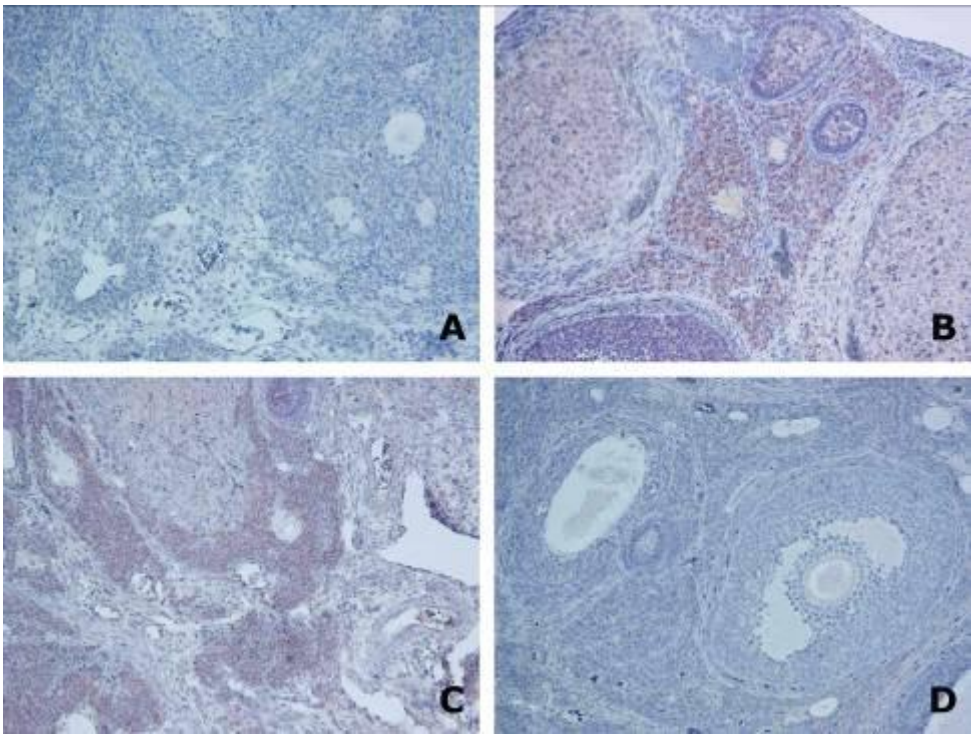

Figure 2. Photomicrographs of the immunohistochemical staining for iNOS (X20) in the ovarian tissues. (A) Sham group, (B) Detorsion group, (C) Detorsion+Allopurinol group, (D) Negative control.