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# Prophylactic ozone administration reduces intestinal mucosa injury induced by intestinal ischemia-reperfusion in the rat

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**Introduction:** Intestinal ischemia-reperfusion injury is associated with mucosal damage and has a high rate of mortality. Various beneficial effects of ozone have been shown. Among these, its triggering the formation of new capillary, increasing the number of defensive cells in immune response, and cellular energy release, and anti-oxidant efficacy may be mentioned. The aim of the present study was to show the probable effects of ozone in ischemia reperfusion model produced in intestines.

**Materials and Methods:** After the approval of local ethics committee, 28 Wistar rats were randomized into four groups with seven rats in each group. **Control** group was administered SF intraperitoneally. Ozone group was administered 1 mg/kg ozone intraperitoneally for five days. **Ischemia Reperfusion (IR)** group underwent superior mesenter artery occlusion for one hour and then reperfusion for two hours. In **Ozone + IR** group, 1 mg/kg ozone was administered intraperitoneally and superior mesenter artery occlusion was made for one hour for five days. Subsequently, occlusion was terminated after 2nd hour of reperfusion, rats were anesthetized with 80 mg/kg ketamin and their intracardiac blood was drawn completely and they were sacrificed. Blood samples and intestine tissue samples were sent to laboratory for superoxide dismutas (SOD), catalase (CAT), glutation peroxidase (GSH-Px), malondyaldehide (MDA), total oxidant score (TOS), total antioxidant score (TAS) analysis. The degree of tissue injury in intestinal tissue was evaluated by Chiu scoring. Data were evaluated statistically by Kruskal Wallis test.

**Results:** In Ischemia-reperfusion group, in jejunum and ileum, villus length and cripta depth was found to be statically significantly decreased compared to control ($p<0.05$). In the group administered ozone before ischemia reperfusion procedure, villus length and cripta depth was found to be increased in comparison to ischemia reperfusion group. ın jejeunum and ileum ($p<0.05$). In the groups administered ozone before ischemia/reperfusion, it was established that in villi, intestinal epithelium maintained its integrity and that intestinal injury score was decreased compared to the ischemia reperfusion group. Although the difference between them was not significant of antioxidant parameters, SOD, GPX, CAT values were found to be highest in ozone group and lowest in IR group. While PCO, and MDA were found to be lowest in ozone group and highest in IR group. In addition, statistically significant difference was found between groups in terms of TOS and TAS values ($p<0.001$). In both TOS and TAS values, significant difference was found between ozon and IR group, control and ozone group, control and IR group, control and IR+ozone group, ozone and IR+ozone group and IR and IR+ozone group.

**Discussion:** Ischemic tissue reperfusion aggravates acute ischemic injury via the formation of reactive oxygen and nitrogen components. In the present study, ozone administration had an effect improving I/R associated tissue injury. In the group administered Ozone, intestinal injury was decreased according to Chui scoring.

In the present study, ozone therapy prevented intestina from ischemia reperfusion injury. Further studies are required to explain the mechanisms mediating the protective effect of ozone on IR injury produced in intestine.

## Biography

Dr. I. Ozkan Onal has completed his medical education from Ankara Gazi University Medical School and he has completed his anesthesia training from Ankara Hacettepe University Medical School and he is working in Ankara Yuksek Ihtisas training and educational hospital. He has published more than 15 papers about anesthesia.

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