Summary of the MSc thesis No. 10823 Faculty of Veterinary Medicine, Urmia University

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Title of thesis: Evaluation of biochemical effects of pyrroloquinoline quinone (PQQ) against liver damage caused by renal ischemia-reperfusion injury in rat

Summary:

Renal ischemia-reperfusion (RIR) is a pathological condition due to transient restriction of blood flow to the kidneys which is followed by the subsequent recovery of perfusion and re-oxygenation. Remote organ injury is one of the complications that dvelops following ischemia-reperfusion induced acute kidney injury (AKI) and dramatically increases the mortality rate. The generation of reactive oxygen species (ROS) during oxidative stress contributes to the occurrence of RIR. The current study examined the biochemical effects ofPQQ against liver damage caused by renal ischemia-reperfusion injury in rat. Twenty-eight rats were divided randomly into the following groups: Sham groupControl group, IRI and renal PQQ (10 mg/kg) groups. PQQ was administered intraperitoneally, 30 min before induction of renal ischemia in PQQ group. The harvest time points were 24 hours post reperfusion in all groups. The animals were sacricified, then the liver tissue of each group was separated and the concentrations of urea, creatinine, and serum activity of liver enzymes alanine aminotransferase (ALT) and aspartate aminotransferase (AST) were measured in serum. Serum concentrations of urea and creatinine were increased in the renal ischemia-reperfusion group compared to the Sham and control groups ($P < 0.05$). A significant difference was observed in the reduction of urea and creatinine serum concentrations in the group treated with pyrroloquinoline quinone (PQQ) ($P < 0.05$). Administration of PQQ caused a significant decrease in MDA concentration compared to IRI group ($P<0.05$). The total antioxidant capacity of the liver was increased in the PQQ group compared to the IRI group, although this increase was not significant ($P>0.05$). PQQ could partially improve the liver damage caused by renal ischemia-reperfusion injury.

Key words: Ischemia/reperfusion; kidney; pyrroloquinoline quinone; rat