Ischemic acute renal failure (ARF) is a common clinical event leading to development of chronic kidney disease and a high mortality. ARF has a higher incidence in elderly people than younger ones. β glucans are glucose polymer groups possessing protective effects against oxidative damage through an effective free-radical scavenger function. In this study, effects of β glucan on renal ischemia/reperfusion injury were investigated in young and aged Sprague Dawley rats. 56 female rats were randomly assigned to two main groups as young (4 months old) and aged groups (16 months old). Groups were designed as follows: Young and aged sham, young and aged I/R, young and aged β glucan, young and aged I/R+β glucan. I/R were performed as described previously. β glucan was administered by gavages at a dose of 50 mg/bw/day for 10 days prior to the surgery. At the end of the experiment, following collection of blood samples from the heart, rats were sacrificed and kidneys were removed Creatinin, blood urea nitrogen, oxidant/antioxidant status, thiol, myeloperoxidase (MPO), paraoxanase (PON), catalase (CAT) and aryl esterase (ARES) were measured in serum. Histopathological changes including tubular degeneration, vacuolization, tubular necrosis, glomerulosclerosis, hemorrhage, capillary dilatation and congestion and intercellular edema were evaluated.

Mean HDSs of sham operated young and old groups were 0.5±0.83 and 1±0.57; respectively whereas 8±1.67 of young and 4.86±1.34 aged I/R groups. Mean HDSs of young β glucan I/R group was 1.83±0.75 and of aged β glucan I/R group was 2.75±1.16. A significant difference was detected between young sham and young I/R group (P<0.001). Serum urea and creatinin levels of young and aged of sham group and β glucan administered groups were all lower than those of I/R and β glucan+ I/R groups. Significant differences in creatinin levels were detected between young and aged β glucan administered groups and I/R performed groups (P<0.001, P<0.01; respectively). Mean CAT activities and MPO levels of young and aged β glucan administered groups were lower than those of I/R and β glucan+ I/R groups. PON activities of sham operated young and aged rats were higher than those of I/R and β glucan+ I/R rats. Thiol levels of young and aged I/R groups were higher than those of β glucan+ I/R groups. Differences in total oxidant and antioxidant status among groups were not significant.

As a conclusion, β glucan found to be protective against renal I/R injury in young and aged rats. However, we suggest that oxidative stress should have been evaluated in tissue samples rather than sera since 2 hours, full duration of the experiment, probably is not sufficient for indicating oxidative damage in serum. Tissue analysis of the experiment are continuing.