

Oat attenuation of diabetic nephropathy

Jalaluddin A Jalal, Hanna Banaema and Sayed AA

King Abdulaziz University, Saudi Arabia

The mitochondrial overproduction of reactive oxygen species (ROS) plays a central role in the pathogenesis of diabetic nephropathy (DN). To assess the effect of oat on experimental DN, male Wistar rats were injected with STZ and divided into 5 groups each of 10 rats, control, and diabetic untreated, diabetic treated with 5, 10, and 20% (w/w) oat in the diet for 12 weeks. Novel data were obtained in this study indicating a protective role of oat against oxidative stress and DN.

In the diabetic rats treated with oat, fasting blood sugar, kidney/body weight ratio, creatinine, BUN, sodium and albuminuria were significantly decreased compared with untreated diabetic rats. Diabetic rats showed decreased activities of superoxide dismutase, glutathione peroxidase and catalase, increased concentrations of malondialdehyde and IL-6 in the kidney homogenate. In addition levels of 8-hydroxy-2'-deoxyguanosine in the urine and in the renal cortex DNA were increased. Moreover, severe destruction in glomerular and tubulointerstitial lesions such as glomerular sclerosis, atrophy, interstitial expansion, and interstitial cellular infiltration was seen in the kidney of the diabetic untreated rats. Treatment with oat restored all the altered parameters in a dose-dependent manner. Furthermore, all of the ultra-morphologic abnormalities in the kidney of diabetic rats were markedly ameliorated by oat treatment.

In conclusion, oat confers a considerable protection against kidney injuries of the diabetic rats by increasing activities of antioxidant enzymes, attenuating the formation of AGEs, ameliorating the inflammatory markers and inhibiting the accumulation of oxidized DNA in the kidney, suggesting a potential drug for the prevention and therapy of DN.

jalalawlia@yahoo.com