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Research article

Whey protein concentrate supplementation suppresses DNA damage and regenerates insulin release in streptozotocin-induced diabetic rats

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Abstract

Improving potential of milks' proteins on carbohydrate metabolism has been suggested. It is proposed that supplementation of diet with concentrated milk proteins could might ameliorate diabetes deteriorations and differentially protect against DNA damage; therefore, this study aimed to estimate the efficiency of whey protein concentrate (WPC 80%) in STZ-induced diabetic rats. The hyperglycemic groups were made with a single (ip) dose of STZ (55mg/kg). Five groups of rats were used; (I) normal control group, (II) WPC (200 mg/kg/day) treated group, (III) STZ-diabetic rats acted as positive control; (IV) group included diabetic rats treated orally with (0.1 mg/kg/day) Amaryl®1mg; and (V) included diabetic rats treated with WPC. After six weeks of the study, treatment of diabetic animals with WPC markedly exhibited anti-diabetic, dyslipidemia, anti-DNA damage, hepato-renal protection and anti-oxidative stress potentials. These effects were monitored from the significant reduction in glucose, cholesterol, triglycerides, LDL, DNA fragmentation, ALAT, ASAT, urea, creatinine, MDA and NO levels concomitant with a significant raise in insulin, HDL, GSH, SOD, GPx and CAT values close to the corresponding values of healthy ones. Also, WPC succeeded to modulate STZ-induced histological distortion. In conclusion, WPC exhibits multi-health benefits with promising potentials against STZ-induced diabetes; this behavior may be attributed to its antioxidant and free radical scavenging mechanisms that due to vie its thiol-rich amino acids and antioxidant, as evidenced by in vitro investigations.