The effect of oral supplementation of Spirulina platensis microalgae on trace elements concentration in diabetic rats

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Background: Trace minerals (TMs) are necessary for some essential functions in body and they affect the pathogenesis of diabetes mainly by their role in peroxidation and inflammation. On the other hand, Spirulina platensis microalgae (SPM) is known as a strong antioxidant and it also contains some TMs. Thus, this study aimed to investigation the effects of SPM on plasma TMs levels in diabetes rats and also healthy rats.

Methods: Sixty four rats were grouped to 8 groups (n=8) and orally treated with 0, 10, 20, 30 $mg.kg^{-1}$ body weight of SPM. Experimental groups were as follows; diabetic rats fed with 0 $mg.kg^{-1}$ SPM (DC: diabetic control), 10 $mg.kg^{-1}$ SPM (SD10), 20 $mg.kg^{-1}$ SPM (SD20) and 30 $mg.kg^{-1}$ SPM (SD30). Healthy rats treated with 0 $mg.kg^{-1}$ SPM (HC: healthy control), 10 $mg.kg^{-1}$ SPM (SH10), 20 $mg.kg^{-1}$ SPM (SH20) and 30 $mg.kg^{-1}$ SPM (SH30). At the end of trial, blood samples were collected for measurement plasma concentrations of TMs and glucose.

Results: Our findings showed that diabetes significantly lowered the plasma concentration of TMs and increased the plasma concentration of glucose (DC vs. HC), but oral supplementing with SPM, SD20 and SD30 groups, significantly increased the plasma concentration of zinc, iron, magnesium and copper and also reduced glucose concentration compared with DC group ($P<0.05$), but SPM supplementing had not significant effect on plasma selenium and chromium levels ($P>0.05$).

Conclusion: It can be concluded that SPM, especially at high levels, acts as an efficient nutrient for improvement of TMs in diabetic rats.

Keywords: Diabetes, Glucose concentration, Plasma zinc, Selenium, Spirulina platensis