

High sucrose diet induced diabetes in WNIN/Gr-Ob obese rats: Biochemical and histological changes

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Acceleration of natural ageing occurs due to multiple reasons such as stress, obesity and Type 2 diabetes working in a vicious cycle. In the present study, we tested if superimposing type 2 diabetes in a rat model of obesity accelerates ageing or not. We aggravated insulin resistance/ induced type 2 diabetes by feeding high sucrose diet (HSD) to 9-10 wk old, male, WNIN/Gr-Ob obese rats. We report here the changes in physiological, biochemical and histological parameters after 3 and 6 months of feeding. Rats fed HSD had the highest insulin resistance as evident from increased HOMA IR and AUC insulin during OGTT. Body weight gain and Food efficiency ratio (FER) were also significantly higher in HSD fed than the control rats after 6 months of feeding. Further, liver steatosis and kidney damage were the highest in the HSD fed rats as evident from ORO staining. Interestingly, HSD fed rats also had the highest intensity of β -cell staining and functioning (as indicated by higher HOMA- β). The findings indicate that parameters associated with ageing were accelerated in WNIN/Gr-Ob rats fed HSD, implying that aggravating insulin resistance in obese rats may be associated with accelerated ageing.

Keywords: Accelerated ageing, Food efficiency ratio (FER), Homeostatic model assessment (HOMA), HSD, Insulin resistance, Liver steatosis, Obesity, ORO staining, Type 2 Diabetes