INTERMITTENT FASTING RAMADAN MIMIC IMPROVES INSULIN SENSITIVITY IN DIET-INDUCED DIABETIC SAND RATS

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Aim: This study aimed at exploring the effects of daily intermittent fasting upon the time-related changes in insulin sensitivity and glucose homeostasis in diabetic sand rats switched from vegetal diet to hypercaloric one. Methods: Fifty-two sand rats were either maintained on the vegetal diet or given access to a hypercaloric synthetic chow. Based on postprandial glycemia, the latter 38 rats were divided in two groups: either non-diabetic (glycemia<7.0 mmol/l) or diabetic (>8.3 mmol/l). Thereafter, each group were divided in two subgroups: the animals given free access to either the vegetal (control rats) or the hypercaloric diet, and a group undergoing thirty days of intermittent daily fasting from 5 p.m. to 8 a.m. on the next day. An intraperitoneal glucose tolerance test was performed in the non-diabetic and diabetic rats at the 10th, 20th and 29th day of fasting period. ABC-DAB immunohistochemical staining was performed to assess islet beta-cells insulin content. Results: In diabetic rats, the postprandial glycemica increased ($p< 0.02$) from 11.7 ± 0.9 mmol/l to 16.6 ± 1.5 mmol/l ($n = 13$) over the last 30-day period in non-fasting animals, whilst decreasing from 10.6 ± 1.2 mmol/l to 6.5 ± 0.7 mmol/l ($n = 6$) in the intermittently fasting animals. A comparable situation was documented during the IPGTT. Insulin resistance HOMA and islet beta-cells insulin content were improved in fasting diabetic rats compared to the non fasting group. Conclusion: In this case, mimetic Ramadan intermittent fasting prevents in both non-diabetic and diabetic animals, the progressive deterioration of glucose tolerance.