8- Experimental obesity and diabetes reduce male fertility: Potential involvement of hypothalamic Kiss-1, pituitary nitric oxide, serum vaspin and visfatin

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Abstract:

Reproductive dysfunction is a common consequence of both obesity and diabetes. This study investigated the impact of obesity and diabetes, alone or combined, on physiological reproductive parameters in male rats. Twenty-four male Wistar Albino rats were divided into four groups: Control; obese non-diabetic; diabetic; and obese diabetic. Obesity was provoked by consumption of a high-fat diet (HFD) consisting of 40% energy from fat for 90 days. Diabetes was induced by an intraperitoneal injection of streptozotocin at a dose of 40 mg/kg/day for three consecutive days. Semen, histopathological, and morphometric analyses were carried out. Serum testosterone, luteinizing hormone (LH), and vaspin and visfatin were measured using ELISA kits. Hypothalamic Kiss-1 mRNA was detected using qPCR and pituitary nitric oxide (NO) was determined using Griess reagent. Our results showed a decrease in semen quality parameters, testosterone, and LH levels with degenerative changes in the testes in experimental groups when compared to control group. This had a positive correlation with hypothalamic Kiss-1 and a negative correlation with pituitary NO and serum vaspin and visfatin. In addition, adverse effects were more pronounced in animals with obesity and diabetes combined compared to rats who were either diabetic or obese. In conclusion, obesity and diabetes, alone or combined, had a negative impact on male rat fertility. Moreover, obesity and diabetes combined had more harmful effects on male fertility when compared with obesity alone. Hypothalamic Kiss-1, pituitary NO, and serum vaspin and visfatin may play a role in the pathophysiology of male infertility-associated with obesity and diabetes.

Keywords:

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