EFFECTS OF HEATING IN OBESOGENIC DIETS ON OBESITY INDUCTION, BIOCHEMICAL AND BEHAVIORAL PARAMETERS


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INTRODUCTION: According to the WHO, obesity is increasing around the world mostly due to a sedentary lifestyle and increased consumption of high-calorie and processed foods. Moreover, modern diets are a large source of advanced glycation end products (AGEs), which are compounds formed in food during heating process. Obesity as well as exogenous dietary AGEs are known to contribute to increased oxidative stress and inflammation, which are associated with cardiovascular disease, type 2 diabetes and neurodegenerative diseases. Studies have shown that AGEs may be linked with mental disorders, but there are few studies evaluating its effects on behavioural parameters such as anxiety. Therefore, the aim of this work was to evaluate the role of heating in two obesogenic diets on obesity induction, biochemical and behavioural parameters.

MATERIALS AND METHODS: Male Wistar rats (8 weeks old) were divided into sex groups (n=9): Control, high fat diet (HFD) and high fat and sucrose diet (HFSD), which were heated or maintained natural. Diets were given for 16 weeks and fasting blood glucose; serum N-(carboxymethyl)-lysine (CML), TNF-α, protein and lipid damage were measured at the end of treatment. The open-field and Y-maze tests were performed to evaluate locomotor/exploratory activity behavior and memory, respectively. RESULTS: Rats fed with unheated HFSD and heated HFD presented the highest weight gain and consequently were the heaviest. Obesogenic diets-fed rats displayed increase in serum TNF-α, protein carbonilation and lipid peroxidation when compared to controls. Heating showed influence serum CML. Fasting glucose was higher in heated HFD when compared to the other diets, but in control and HFSD the heating didn’t alter fasting glucose. Regarding behavioural parameters, heated HFD-fed rats showed less alternation when compared to unheated HFD-fed rats suggesting greater cognitive deficit. Heating didn’t affect locomotion/exploration in any diet. CONCLUSIONS: Heating of obesogenic diets showed change some behavioural, biochemical and obesity induction parameters.

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KEY WORDS: Obesity, AGEs and behaviour