Reproductive Parameters in a Model of Visceral Obesity

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Introduction: monosodium glutamate can induce obesity and influence negatively in the rat reproductive function.

Objective: To evaluate the influence of the visceral obesity on the reproductive function.

Methods: Newborn female Wistar rats were divided into 2 groups to receive MSG (4 mg/g of body weight) or NaCl 0.9%, subcutaneously, on days 2, 4, 6, 8, and 10 of life. At 90 days the animals injected with monosodium glutamate were determined the corporal weight (g) and the corporal length (cm) for the calculation of the Lee index (cube root of the body weight/corporal length). With values higher than 0,300 obesity was confirmed. From this day and to the day 105 of life vaginal smears were collected every morning that were observed under light microscope for determination of the estrous cycle duration (days). Rats were then mated overnight with healthy males of the same substrain, starting from 120 days of age. Gestational day 0 was defined when sperms were found in vaginal smear. To a group of obese (n=15) and controls (n=13) practiced them euthanasia the day 11 of gestation. To the rest of the animals practiced them euthanasia the day 20 of gestation (Controls: n=10, Obese: n=11). The uterus was dissected out. The ovaries and uterine contents were examined to determine the number of corpora lutea, implantation sites, resorptions and number of embryos and live and dead fetuses. Reproductive parameters were determinated: fertility index (number of pregnant females x 100 /number of mated females); pregnancy index (number of dams with live pups x 100 / number of pregnant females); preimplantation loss rate (number of corpora lutea−number of implantations × 100/ number of corpora lutea). The postimplantation loss rate (number of implantations−number of living fetuses and embryos × 100/number of implantations). InfoStat program and Statistic package (version 10.0) were utilized. To compare continuous nonparametric variables between groups, the Mann-Whitney U test was used. Fisher exact test was used to compare proportions. A P value < 0,05 was considered significant.

Results: the estrous cycle duration was significant increase in obese rats compared to controls. The obese rats had a significant reduced number of corpora lutea, implantations and number of embryos and fetuses. There were no significant differences in fertility and pregnancy indexes, preimplantation and postimplantation loss rates. **Conclusion**: monosodium glutamate-induced obesity had influence negatively the rat reproductive function, that can be due to the combined effect of the hypothalamic lesion induced by monosodium glutamate and the metabolic own alterations of obesity.

Key words: visceral obesity, reproductive function, monosodium glutamate