P04 Prostatic atrophy in Wistar rats' offspring is promoted by maternal high-fat diet

Eur Urol Suppl 2019;18(8):e3066

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Introduction & Objectives: Overnutrition during gestation and lactation may promote a higher risk of cardiovascular and metabolic disease in adult life. However, little is discussed about its effects on the prostate. Therefore, this study aimed to evaluate the effects of high-fat diet intake during pregnancy, lactation and/or postnatal period on the prostate morphology of Wistar rats at 4 months-old.

Materials & Methods: Twenty female Wistar rats were assigned to be fed with either control diet (C) or high-fat diet (HF - rich in cholesterol), during pregnancy and lactation. After birth, males offspring were divided into 4 groups as following: C/C – offspring of dams fed C during gestation and lactation, maintaining a C diet at postnatal period, C/HF – offspring of dams fed C during gestation and lactation, changing to HF diet at postnatal period, HF/C - offspring of dams fed HF during gestation and lactation, changing to C diet at postnatal period and HF/HF - offspring of dams fed HF during gestation and lactation, maintaining a HF diet at postnatal period. Biometric (food intake, body weight) and metabolic parameters (oral glucose tolerance test, serum glucose, total cholesterol, triacylglycerol, insulin and testosterone levels) were performed in both dams and pups. At euthanasia, the ventral prostate was dissected and embedded for histomorphometrical analysis. Data were analyzed by unpaired t-test or one-way ANOVA and Bonferroni posttest, considering $p<0.05$.

Results: Dams did not present any difference on the body mass gain and energy intake during the perinatal period. Similarly, no differences were found in insulin and total cholesterol levels at the offspring among the groups. Therefore, postnatal HF diet diminished testosterone serum levels in comparison to C/C group ($p=0.0218$). In contrast, the administration of HF diet on perinatal period (HF/C group) promoted an elevation on triacylglycerol levels in comparison to C/C group ($p=0.0005$). In the same way, serum glucose was higher in this group and in HF/HF than control group ($p=0.0017$). Regarding the pups prostate, the acinar area was lower in all groups than C/C ($p<0.0001$); the epithelium height was decreased in the HF/C and HF/HF in comparison to C/C and C/HF groups ($p<0.0001$); the smooth muscle cells area density was reduced by the peri or postnatal HF diet; the connective tissue area density was negatively infuenced by perinatal and postnatal HF diet when compared to control group ($p=0.0013$; $p<0.0001$, respectively) and the epithelium area density was lower in HF/C than C/C and C/HF groups ($p=0.0024$).

Conclusions: The HF diet during gestation, lactation, and/or the postnatal period promoted hyperglycemia and prostatic atrophy. These data suggest that a HF diet could be promoted a impairment of the secretory activity and contractility the prostate, which may impair its activity in adulthood.

Supported by Grants from CNPq and FAPERJ.