

TITLE: CHANGES IN GUT MICROBIOTA IN AN EXPERIMENTAL MODEL OF MENOPAUSE AND ITS RELATIONSHIP WITH HIGH-FRUCTOSE DIET

AUTHORS: MELO-NETO, M. F.; MARANHÃO, F. C. A.; GUIMARÃES, P. S.

INSTITUTION: INSTITUTO DE CIÊNCIAS BIOLÓGICAS E DA SAÚDE, MACEIÓ, AL (AV. LOURIVALMELO MOTA, S/N, CEP 57072-900, MACEIÓ-AL, BRAZIL)

ABSTRACT

Metabolic syndrome (MSyn) is a worldwide health problem and prevalent in postmenopausal women compared to premenopausal women and men of the same age. High-sugars in diet can change the gut microbiota (GM) composition and fructose consumption in industrialized foods has been considered a predisposing factor to MSyn. Thus, the present study aimed to evaluate the relationship of the GM with menopause and a high-fructose diet in an experimental model. Adult female *Wistar* rats were subjected to ovariectomy (ovx) or *sham* surgery (*sham*) and divided into 4 groups for follow-up during 14 wk: rats were fed a high-fructose diet (10% solution in drinking water; ovx-F/*sham*-F) and rats with a control diet (water; ovx-C/*sham*-C). One gram of faeces was collected immediately before of each surgery (T0), and in the 4th (T4), 8th (T8) and 12th (T12) subsequent wks. Faeces were macerated, diluted in 20 ml of sterile 0.9% saline and vortexed for 3 min. After 30 min, a dilution was performed (1:100) and 100 µl were cultured in blood agar (5%), in duplicates, for incubation (24h; 36C°); A manual count of the colony forming units (CFUs) was made and 10 colonies of each culture were collected for Grain stain, followed by pure culture on brain-heart infusion (BHI) and stock in BHI-glycerol 20%. The groups ovx-F and *sham*-F (each with 9 rats) presented a gradual increase (T0 to T12) of the CFUs when compared to controls (ovx-C/*sham*-C, 9 and 6 rats): in T12 the average of the UFCs in countable plates were 263.75 UFCs from *sham*-C, 184.93 UFCs from ovx-C, 337.3 UFCs from *sham*-F and 689 UFCs from ovx-F. 6 of the 9 rats of the *sham*-F/ovx-F groups were unable to count UFCs due to the high growth. In 1321 isolates (T0 to T12), we identified gram-positive cocci-GPC (*sham*-C: 15,9%; ovx-C: 24,67%; *sham*-F: 14,45%; ovx-F: 18,5%), gram-positive bacilli-GPB (*sham*-C: 1,28%; ovx-C: 2,42%; *sham*-F: 8,49%; ovx-F: 4,76%), gram-negative bacilli-GNB (*sham*-C: 1%; ovx-C: 2,64%; *sham*-F: 2,04%; ovx-F: 4,76%), gram-negative cocci-GNC (*sham*-C: 1%; ovx-C: 0,37%; ovx-F: 0,3%) and yeasts only in ovx (C: 0,15%; F: 0,37%). GNC and yeasts was not observed in *sham*-F and *sham*-C/F, respectively. The high-fructose intake increased the quantity of GPB, while at T4 we confirmed an increase of GNB (*sham*-C/F and ovx-C/F) and GNC (*sham*-C and ovx-C/F; reduction at T8-T12). Complementary results will may contribute to elucidate the relationship between the physiological actions of estrogen, high-sugar diet and gut microbiota.

Keywords: menopause; metabolic syndrome; fructose; gut microbiota; dysbiosis.

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