SPONTANEOUSLY HYPERTENSIVE RATS AND DOWN-REGULATES ENDOTHELIAL OXIDE NITRIC SYNTHASE IN THE AORTIC ARCH

Adriana Laura BURGUEÑO (1) | Melisa Florencia MENSEGUE(2) | Noelia Luz GONZALEZ MANSILLA(2) | Mariana L TELLECHEA(2)

INSTITUTO DE INVESTIGACIONES BIOMEDICAS (UCA - CONICET) (1); INSTITUTO DE INVESTIGACIONES MEDICAS A LANARI (UBA - CONICET) (2)

Essential hypertension is considered to be a result of the interaction between genetic and environmental factors, including perinatal factors. Different advantageous perinatal factors proved to have beneficial long-lasting effects against an abnormal genetic background. Taurine is a ubiquitous sulphur-containing amino acid present in food. The antihypertensive effects of taurine have been reported in experimental studies and in human hypertension. We aimed to investigate in spontaneously hypertensive rats (SHR), a known model of genetic hypertension, whether taurine administration during pregnancy and lactation would influence 1) systolic blood pressure (SBP), 2) aortic geometry, and 3) cardiac hypertrophy in adult offspring. Additionally; we aimed to determine whether perinatal taurine administration is associated with changes in relative telomere length (RTL) and gene expression of target genes. Female SHR were administered with taurine (3 g/l) during gestation and lactation (SHR-TAU). Untreated SHR and Wistar-Kyoto rats (WKY) were used as controls. Long lasting effects in offspring were investigated. Addition of taurine to the mother's drinking water improved SBP in adult offspring. No differences were observed in aortic morphometry or cardiac hypertrophy. We suggest that taurine programming albeit sex-specific, is associated with gene expression changes which ultimately may lead to improvement of aortic remodelling and enhanced endothelial function because of augmented nitric oxide production. Specifically, we found modifications in gene expression of Bcl-2 family members and upregulation of endothelial nitric oxide synthase in the aorta of 22-week-old male offspring. No differences were observed on RTL in different cardiovascular tissues between SHR and SHR-TAU. Although SHR have responded only moderately to perinatal treatment, our findings supports the possibility of improving the genetically hypertensive state by manipulating the early environment.

0111 - HYPOLIPIDEMIC EFFECTS OF N-ACETYLCISTEINE IN CF-1 MICE FED A HIGH-FAT DIET

Liliana Noemi GUERRA (1) | Laura MONTALDO(1) | Evelyn FRONTERA(1) | Zaira NAGUILA(2) | Santiago ALEJO(2) | Claudia MARTINI(2)

UNIVERSIDAD NACIONAL DE LUJAN - DEPARTAMENTO DE CIENCIAS BASICAS (1); UNIVERSIDAD DE BUENOS AIRES- FACULTAD DE CIENCIAS EXACTAS Y NATURALES (2)

We showed that antioxidant N-acetylcysteine (NAC) inhibits cellular lipid accumulation during adipocyte differentiation in vitro (Soto et al, 2016 and Pieralisi et al, 2017). Here we evaluated effects of NAC on mice fed a high-fat diet and in vivo lipid parameters. FCEyN – UBA CICUAL approved this protocol. Thirty-six CF-1 male mice weighting from 39 to 42 g were randomly assigned to 4 treatment groups, fed a normal-fat diet with 2.9 Kcal/g without (group C, n= 12) or with NAC (group CN, n= 12) and a high-fat diet with 5.7 Kcal/g without (group O, n= 6) or with NAC (group ON, n= 6) for 45 days. NAC supplementation in drinking water was 1.2 g/L, animals fed and drank ad libitum. We did not observe toxic effect of NAC and, all mice consumed similar amount of food and water during treatments. At day 45, we determined mice body weight (BW) and sacrificed them. We evaluated: a) serum cholesterol (Chol) and triglyceride (Tg) levels; b) liver and omental adipose tissue histology; c) omental fat weight (OFW). At day 45 CN had significantly lower BW than C (46.8 ± 1.2 [C] vs. 42.0 ± 0.7 g [CN], $p<0.01$); but ON had similar BW as O (43.9 ± 1.1 g [O] vs. 44.7 ± 3.1 g [ON], $p= 0.5$). Nevertheless, O showed significantly higher Chol and Tg levels than C (Chol: 3.32 ± 0.05 mmol/L [O] vs. 1.92 ± 0.05 mmol/L [C], $p<0.01$; Tg: 2.94 ± 0.07 mmol/L [O] vs. 2.58 ± 0.11 mmol/L [C], $p<0.01$). Chol and Tg levels significantly decreased in ON compared to O (Chol: 2.80 ± 0.02 mmol/L [ON], O vs. ON $p<0.01$; Tg: 2.81 ± 0.03 mmol/L [ON], O vs. ON $p<0.01$). Hematoxylin-eosin stained samples did not present significant difference in hepatic cells between the groups; NAC reduced almost 30 % adipocyte size in ON compared to O. We observed 40 % reduction in OFW in mice treated with NAC compared to untreated mice. Our results suggested that NAC administration through drinking water could decrease serum Chol and Tg in CF-1 mice fed a high-fat diet, NAC also could decrease omental fat weight.

0134 - FISH OIL SUPPLEMENTATION OF A DIET PROVIDED OMEGA 9 FATTY ACIDS. STUDY ON SERUM, THYMUS AND BRAIN OF GROWING RAT.

Ines FERNÁNDEZ(1) | Anabel Rocío IMPA CONDORI(1) | Paula PERRIS(1) | María Silvia GIACOMINO(2) | Nora SLOBODINIK(1) | **María Susana FELIÚ** (1)

UNIVERSIDAD DE BUENOS AIRES. FACULTAD DE FARMACIA Y BIOQUÍMICA. CÁTEDRA DE NUTRICIÓN. (1); UNIVERSIDAD DE BUENOS AIRES. FACULTAD DE FARMACIA Y BIOQUÍMICA. CÁTEDRA DE BROMATOLOGÍA. (2)

Dietary lipids have an important role in nutrition. This work analyzed the effect of diet containing olive oil, with and without the supplementation with omega 3, on serum, thymus and brain's fatty acid profiles of growing rats. Weanling Wistar rats fed during 10 days a diet containing olive oil as fat (O group). Other group received the same diet supplemented with 24 mg/day of fish oil (OS group). Control group (C) received diet according AIN´93. Serum, thymus and brain's fatty acids profiles were determined by gas chromatography. Statistical analysis used ANOVA. Results (%Area) were: SERUM: OLEIC O:23.44 ± 3.68a; OS: 18.31 ± 2.22b; C: 10.60 ± 2.01a. LINOLEIC (LA) O: 12.44 ± 1.65b; OS: 12.98 ± 4.31b; C: 18.27 ± 2.81a; LINOLENIC (ALA) O: 0.30 ± 0.09b; OS: 0.32 ± 0.08b; C: 0.92 ± 0.34a; EPA O: 0.65 ± 0.17a; OS: 1.63 ± 0.49b; C: 0.80 ± 0.23a; DHA: O: 1.57 ± 0.58a; OS: 4.00 ± 1.70b; C: 1.33 ± 0.19a. THYMUS: OLEIC O: 21.54 ± 5.92; OS: 24.40 ± 5.04; C: 18.22 ± 3.23. LINOLEIC O: 5.90 ± 0.56b; OS: 6.5 ± 0.61b; C: 10.89 ± 2.18a; ALA O: 0.27 ± 0.02b; OS: 0.30 ± 0.07b; C: 0.49 ± 0.19a; EPA O: 0.49 ± 0.28; OS: 0.50 ± 0.13; C: 0.50 ± 0.12; DHA O: 0.47 ± 0.10a; OS: 0.70 ± 0.12b; C: 0.52 ± 0.16a. BRAIN: OLEIC O: 13.11 ± 2.64; OS: 12.94 ± 1.07; C: 13.14 ± 1.56. LA O: 1.17 ± 0.46; OS: 1.05 ± 0.33; C: 1.26 ± 0.19; ALA O: 0.15 ± 0.03; OS: 0.12 ± 0.04; C: 0.16 ± 0.06; EPA O: 0.46 ± 0,18; OS: 0.38 ± 0.09; C: 0.33 ± 0.07; DHA: O: 11.39 ± 2.04; OS: 11.32 ± 1.69; C: 11.66 ± 1.63. Data with one letter (a,b) in common, were different ($p<0.05$). In sera, O and OS showed lower ALA and LA and higher oleic levels, compared to C. OS presented high levels of EPA and DHA. In thymus, O and OS groups showed lower levels of ALA and LA than C. The OS group only increased DHA. No changes were presented in brain. The results suggest that olive oil exacerbated omega-9 family with diminution of essential fatty acids while organism tries to compensate brain essential fatty acids. Fish oil supplementation increased serum and thymus DHA levels, not modifying low levels of essential fatty acid. Other source of supplementation may be convenient.

0140 - EFFECTS OF PRENATAL STRESS AND POSTNATAL HIGH FAT DIET FEEDING ON BALB/C MICE METABOLISM.

Sofia QUIROGA (1) | Yamila JUAREZ(1) | Mariana L TELLECHEA(2) | Ana Maria GENARO(1) | Adriana Laura BURGUEÑO(1)

INSTITUTO DE INVESTIGACIONES BIOMEDICAS (UCA - CONICET) (1); CENTRO DE INVESTIGACIONES ENDOCRINOLÓGICAS "DR. CÉSAR BERGADÁ" (CEDIE) - CONICET - FEI (2)

In-utero exposure to maternal stress increases short and long term risk of suffering metabolic diseases. Exposure to stressful events leads to an increase in glucocorticoids release by activation of the HPA axis, therefore early programming of the HPA axis has emerged as a key underlying mechanism of stress-related disorders. Evidence suggests that a stressful prenatal environment seems to favour adverse metabolic conditions. To test this hypothesis in BALB/c mice, a strain susceptible to stress but resistant to metabolic effects of a high fat diet (HFD), we exposed female pregnant mice to restraint stress during the last week of pregnancy (2 h/day). Offspring were fed with HFD between weeks 4 and 28 of age. Prenatally stressed (PS) females and males fed with HFD showed higher body weight (females: $p<0.001$, n= 8; males: $p<0.01$, n= 8) and adipose tissue content (adipose tissue weight/body weight, both sexes: $p<0.001$, n= 8). Females were hyperinsulinemic ($p<0.001$, n= 5), with decreased expression of Foxo1 (Forkhead box protein O1) a transcription factor that plays important roles in regulation of gluconeogenesis and glycogenolysis by insulin signaling ($p<0.05$, n= 5) and Adiponectin ($p<0.05$, n= 5) in adipose tissue. On the other hand, PS males (fed with standard or HFD) had hypertriglyceridemia ($p<0.001$, n= 8) and hypercholesterolemia ($p<0.001$, n= 8). PS per se, in males, decreased the expression of Adiponectin ($p<0.01$, n= 5). PS animals showed a great susceptibility to develop obesity. We conclude that PS may give rise to some adverse effects, and abnormal phenotype may be provoked by or exacerbated in a later life nutritional challenge. We intend to continue our research by evaluating whether epigenetic alterations are responsible for the observed gene expression alterations.

0144 - MECHANISMS UNDERLYING SKELETAL MUSCLE LIPOTOXICITY IN DYSLIPEMIC INSULIN-RESISTANT RATS: EFFECTS OF DIETARY CHIA (SALVIA HISPANICA L.) SEED.

Maria Del Rosario FERREIRA CORDONEDA | Maria Eugenia OLIVA | María Eugenia Guadalupe D'ALESSANDRO

LABORATORIO DE ESTUDIO DE ENFERMEDADES METABÓLICAS RELACIONADAS CON LA NUTRICIÓN- FBCB-UNL

Lipid accretion in skeletal muscle (SM) is related to the development of lipotoxicity and insulin resistance (IR), however, the mechanisms involved are not fully clarified. We previously shown that rats fed a sucrose-rich diet (SRD) develops IR, dyslipidemia, and SM lipid accretion. Moreover, we demonstrated that all of them were reversed when chia seed (Salvia hispanica L.)-rich in alpha-linolenic acid (ALA, 18:3 n-3)- was administered as a dietary source of fat in SRD-fed rats. The aims of this study were: (i) to explore the mechanisms underlying SM lipotoxicity in SRD-fed rats (ii) to investigate the effects of chia seed on these mechanisms. Male Wistar rats were fed a SRD for 3 months. Half of the animals continued with the SRD until month 6, the other half was fed a SRD in which the fat source, corn oil, was replaced by chia seed from month 3 to 6 (SRD+chia). Another group consumed a reference diet all the time. In SM we analyzed: a. muscle-type carnitine palmitoyltransferase (M-CPT), fatty acid synthase (FAS), and glucose-6-phosphate dehydrogenase (G-6-PDH) enzyme activities, b. protein mass levels of PPARalpha, PPARgamma, total AMPK, pAMPK, precursor and mature forms of SREBP-1 and sarcolemmal FAT/CD36, c. fatty acid composition of SM phospholipids. SM of SRD-fed rats showed a significant reduction ($p<0.05$) of M-CPT 1 enzyme activity, PPARs and pAMPK protein levels. FAS, G-6-PDH enzyme activities, the mature form of SREBP-1 and FAT/CD 36 were increased ($p<0.05$). In SRD+chia-fed rats M-CPT 1 enzyme activity, PPARs and pAMPK protein levels were normalized ($p<0.05$). The precursor and mature forms of SREBP-1 and lipogenic enzyme activities were decreased ($p<0.05$). FAT/CD36 and n-3/n-6 fatty acids ratio of membrane phospholipids were increased ($p<0.05$). In summary, this study shows some mechanisms involved in SM lipotoxicity of insulin-resistant rats fed a SRD and provides novel information on the beneficial effects of chia seed on these mechanisms.

0207 - ALPHA-LINOLENIC ACID-RICH CHIA (SALVIA HISPANICA L.) SEED AMELIORATES ADIPOSE TISSUE DYSFUNTION IN AN EXPERIMENTAL MODEL OF VISCERAL ADIPOSITY AND INSULIN RESISTANCE BY MODULATING LIPID METABOLISM.

Victoria AIASSA | Michelle Berenice VEGA JOUBERT | María Eugenia OLIVA | Maria Del Rosario FERREIRA CORDONEDA | María Eugenia Guadalupe D'ALESSANDRO

LABORATORIO DE ESTUDIO DE ENFERMEDADES METABÓLICAS RELACIONADAS CON LA NUTRICIÓN- FBCB-UNL

Salvia hispanica L. (chia) seed is one of the richest botanical sources of alpha;-linolenic acid (ALA, 18:3 n-3)- and it has generated considerable research interest in recent years. We previously shown in dyslipemic insulin resistant rats fed a sucrose-rich diet (SRD), which have visceral adiposity, that the replacement of corn oil by chia seed in the SRD reduces epididimal adipocyte hypertrophy, triglyceride content, lipogenic enzyme activities and lipolysis. This study aimed to further explore if changes in adipocyte lipid metabolism could be involved in the beneficial effect of chia seed on reducing visceral adiposity. Male Wistar rats were fed a SRD for 3 months. Half of the animals continued with the SRD until month 6, the other half was fed a SRD in which the fat source, corn oil, was replaced by chia seed from month 3 to 6 (SRD+chia). Another group consumed a reference diet all the time. We analyzed: a. morphometrical parameters -body weight (BW), body length, thoracic (TC) and abdominal circunference (AC), body mass index (BMI)- and energy intake; b. Carcass composition; c. visceral adiposity index (VAI) and d. in epididymal adipose tissue (EAT): carnitine palmitoyltransferase (CPT 1, CPT 2 and total CPT) enzyme activities, total AMPK, pAMPK and plasma membrane FAT/CD 36 protein levels. Besides, glucose, insulin, triglyceride, free fatty acids serum levels and insulin sensitivity (IS) were determined. Compared with SRD-fed rats, SRD+chia group shown: a- a decrease ($p<0.05$) in TC, AC, BMI and VAI. BW an energy intake not change, b- a reduction ($p<0.05$) in carcass fat content and weight, c-in EAT: a normalization ($p<0.05$) of both the reduced protein levels of pAMPK and the increased levels of FAT/CD 36. No changes were observed in CPT enzyme activities. Besides chia seed normalizes hyperglicemia, dislypemia and IS. This work shows new possible mechanisms involved in the beneficial effect of chia seed on adipose tissue dysfunction and visceral adiposity.

0243 - EFFECT OF DEHYDROEPIANDROSTERONE SUPPLEMENTATION IN A RAT MODEL OF HIPOESTROGENISM AND OBESITY

Adrián Esteban CAMPELO | Virginia MASSHEIMER

INSTITUTO DE CIENCIAS BIOLÓGICAS Y BIOMÉDICAS DEL SUR (UNS-CONICET)

Obesity is a major worldwide health concern that predisposes individuals to a higher risk of cardiovascular disease (CVD), diabetes and metabolic syndrome. The menopausal period is followed by an increased risk of CVD and is associated with higher rates of overweight and obesity. According to intracrinology, intracellular enzymes may convert dehydroepiandrosterone (DHEA) into active steroids in peripheral tissues without systemic exposure to high estrogens levels, presenting DHEA supplementation as a low risk treatment for menopause. The aim of this study was to analyze the effects of DHEA supplementation in a model of hipoestrogenism and obesity. Four groups (n= 5) of ovariectomized Wistar rats were feed with standard diet (ND) (4 % fat w/w) or high fat (HF) diet (27 % fat w/w) for 8 weeks. Hormonal treatment of rats consisted in daily injectections of vehicle (Cont) or DHEA (1 mg/kg day of DHEA). Daily food intake was 165.3 ± 6.8; 201.1 ± 9.1 Kcal/kg (ND; HF