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cia e a Tecnologia.

CO9: NUTRITIONAL SUPPLEMENT USAGE BY ATHLETES IS ASSOCIATED WITH AGE, SPORTING CHARACTERISTICS, AND HEALTHIER AND SPORTS-DIRECTED FOOD CHOICES

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INTRODUCTION: The consumption of nutritional supplements (NS) is an accepted and highly prevalent practice among athletes. However, the considerable frequent lack of scientific informed choices on NS, and the possibility of a failed doping test due to NS contamination are current matters of concern. Healthier food choices have been associated with NS consumers in general populations, but little is known concerning food behaviours of athletes using NS. Understanding the characteristics associated with the NS-user athlete is determinate to better educate, guide, and prevent the misuse and abuse of these substances.

OBJECTIVES: We aimed to analyze differences in sociodemographic and sporting characteristics, and food intake of athletes using and not using NS.

METHODOLOGY: Tree hundred and four high-performance Portuguese athletes from 13 sports completed (i) a NS usage questionnaire, assessing information on sociodemographic (gender, age, height, weight, athlete's and parental education level), and sporting (type, number of international performances, weekly hours of training and of gym) characteristics, and (ii) a semi-quantitative food-frequency questionnaire (86 items), regarding the previous 12 months. To identify miss-reporting, the ratio energy intake (obtained from food data analysis) to basal metabolic rate (estimated using Schofield equations) was used. Under-reporting cut-off was set at 0.9 and ratios ≥4.0 were considered as over-reporting. Variables were recoded into two categories. Logistic regression with and without adjustment was performed to study associations between all variables and NS usage.

RESULTS: The final sample comprised 241 athletes (66% males, 13–37 y). The majority of them (64%) reported to have used NS. After adjustment, supplement usage was associated with being ≥18 y (odds ratio [OR] 2.57, 95%; confidence interval [CI] 1.17–5.65), performing individual sports (OR 5.45, 95%; CI 2.49–11.93) and >2 h gym/week (OR 2.42, 95%; CI 1.15–5.11), a higher consumption of meat (OR 2.83, 95%; CI 1.36–5.90), eggs (OR 2.53, 95%; CI 1.07–5.96), and yogurt (OR 2.24, 95%; CI 1.08–4.62), and a lower intake of processed meat (OR 0.32, 95%; CI 0.15–0.72), vegetable oils (OR 0.35, 95%; CI 0.17–0.74), margarine (OR 0.37, 95%; CI 0.18–0.76), chips (OR 0.22, 95%; CI 0.10–0.48), and fast food (OR 0.42, 95%; CI 0.19–0.91).

CONCLUSIONS: Athletes using NS had different characteristics from non-users, and seem to have healthier and more sports-directed food choices. Characteristics found to be associated with NS usage may help sport and health professionals to identify an alleged or future NS user, enabling the development of a timely and self-directed supplement scheme.

CO10: MATERNAL PROTEIN RESTRICTION INDUCES RESPIRATORY-SYMPATHETIC OVERACTIVITY AND HIGHER PERIPHERAL CHEMORECEPTORS SENSITIVITY IN MALE RAT OFFSPRING

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INTRODUCTION: Maternal protein restriction in utero or during the perinatal life (gestation, lactation and first infancy) has been propose as predisposing factor to the development of arterial hypertension through unknown mechanisms.

METHODOLOGY: Pregnant Wistar rats received normoproteic (NP, 17% of protein) or low protein diet (LP, 8% of protein) during gestation and lactation. Male offspring (NP: n=9; LP: n=9) at the 30 days were evaluated for respiratory frequency (Rf), mean arterial pressure (MAP) and heart rate (HR) at rest and during cytotoxic hypoxia (0.04% of KCN) in awake experiments. In addition, we performed direct recording of thoracic sympathetic nervous activity (tSNA) and phrenic nerve (PN) in an in situ rat preparation at rest and during peripheral chemoreflex activation. HIF-1α expression was evaluated in carotid bifurcation by western blotting assay. The experimental protocol was approved by the Ethical Committee of the Biological Sciences Center (protocol 044454/2010–94) at the Federal University of Pernambuco.

RESULTS: At 30 d, LP rats exhibited increased Rf (NP: 123±4 *vs.* LP: 142±3 cpm, P<0.05), but no change in MAP and HR. During hypoxia, LP showed higher ΔRf (NP: 105±13 *vs.* LP: 131±2 cpm, P<0.05) and ΔMAP (NP:22±4 *vs.* LP:39±4 mmHg, P<0.05), but no change in ΔHR.. However, the tachypneic response (P=0.14) and bradycardic were similar between the groups (P=0.60). Moreover, at 30 d LP group exhibited higher tSNA (NP: 8±2 *vs.* LP: 16±2 μV, P<0.05) and higher frequency (NP: 12±2 *vs.* LP: 18±1 cpm, P<0.05) and amplitude of PN than NP rats (NP: 5±0.3 *vs.* LP: 8±0.6 μV, P<0.05). During hypoxia, LP rats showed enhanced ΔtSNA (NP: 137±18 *vs.* LP: 247±32 %, P<0.05) and ΔPN (NP: 15±2 *vs.* LP:22±2 cpm, P<0.05). LP rats showed higher HIF-1α expression in carotid bifurcation (91%).

CONCLUSIONS: Rats subjected to perinatal protein restriction had sympathetic-respiratory overactivity and high O$_2$ chemosensitivity associated increased HIF-1α pathway at early age. These findings suggest that increased arterial blood pressure observed in adulthood could be associated to respiratory and sympathetic overload.

CO11: DINÂMICA CLONAL DE SALMONELLA TYPHIMURIUM, S. 4,[5],12:I:- E *S. RISSEN* NA ÚLTIMA DÉCADA EM PORTUGAL

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INTRODUÇÃO: As infeções por Salmonella não tifóide representam um problema global de saúde pública, sendo crucial identificar e seguir clones de serótipos clinicamente relevantes para combater a sua disseminação.

OBJETIVOS: Este estudo teve como objetivo caraterizar a clonalidade e a resistência a antimicrobianos em isolados portugueses (2009-2014) de *S. Typhimurium*, S. 4,[5],12:i:- e *S. Rissen*, serótipos clinicamente relevantes, e comparar os resultados obtidos com dados anteriores (2002-2009).

METODOLOGIA: Analisaram-se isolados de *S. Typhimurium*/n=253, S.4,[5],12:i:-/n=158 e *S. Rissen*/n=26 provenientes de diferentes origens (humanos/alimentos/animais) e de várias regiões de Portugal (2009-2014). Efetuou-se a pesquisa de genes de resistência às sulfonamidas (sul1/sul2/sul3) e de genes relacionados com integrões de classe 1 (intI1/genes qac/cassettes de genes de resistência a antibióticos) por PCR. Em isolados representativos, determinou-se a suscetibilidade a 10 antibióticos [ampicilina-A/cloranfenicol-C/gentamicina-G/canamicina/ácido nalidixico/ciprofloxacina/estreptomicina-S/sulfametoxazol-Su/tetraciclina-T/trimetoprim-Tr] pelo método de difusão em agar com discos (CLSI/EUCAST), a

pesquisa de outros genes de resistência a antibióticos por PCR e as relações clonais por *Pulsed-field Gel Electrophoresis* (PFGE).

RESULTADOS: Em *S. Typhimurium* detetaram-se três clones predominantes: i) "*S. Tyhimurium* DT104" (43%; intl1; 5´CS-aadA2±5´CS-blaPSE-1; sul1±sul2; qacEdelta1), com perfis de resistência a múltiplos antibióticos (MDR) (maioritariamente ACSSuT-blaPSE-1-floR-aadA-sul1-tetG) e de PFGE idênticos aos descritos desde 2002; ii) "*S. Typhimurium* European clone" (23%; sul2 e ausência de intl1/sul1/qacEdelta1) com perfis de MDR e PFGE iguais ou relacionados com os do "European clone" de S.4,[5],12:i:-; iii) "*S. Tyhimurium* produtora de OXA-30" (17%; intl1; 5´CS-blaOXA-30; sul1±sul2; qacEdelta1), com os mesmos perfis MDR (maioritariamente ACSSuT-blaOXA-30-catA-aadA-sul1-tetB) e de PFGE identificados desde 2002. Em S.4,[5],12:i:- detetou-se a presença de três clones: i) "European clone" (75%; sul2 e ausência de intl1/sul1/qacEdelta1; maioritariamente ASSuT-blaTEM-strA-strB-sul2-tetB), que se expandiu ao longo deste período de estudo; ii) "Spanish clone" [6%; intl1; qacEdelta1+qacH; maioritariamente AC(G)SSuTTr-blaTEM-cmlA-floR-(aac(3)-IV)-aadA-sul1-sul2-sul3-tetA-dfrA12] e iii) "Southern-European clone" (1%; intl1; qacH; CSSuTTr-cmlA--aadA-strA-strB-sul3-tetB-dfrA12) com perfis de MDR e de PFGE semelhantes aos descritos desde 2002. Em *S. Rissen* destaca-se a manutenção do clone associado à presença de integrões de classe 1 e perfis de MDR [38%; intl1; sul1/sul3; qacEdelta1/qacH; maioritariamente A(C)SSuTTr-blaTEM-(cmlA)-aadA-sul1-tetA-dfrA12].

CONCLUSÕES: Verificou-se, em todos os serótipos testados, a persistência dos clones MDR e correpondentes perfis de PFGE mais frequentemente identificados na última década. Salienta-se a diminuição dos "Spanish e Southern-European clones" de S.4,[5],12:i:- e a expansão de um novo grupo clonal com perfil ASSuT em *S. Typhimurium* e S.4,[5],12:i:- (European clone). A compreensão da dinâmica clonal e dos fatores promotores da sua sobrevivência/persistência é crucial para a implementação de estratégias efetivas de segurança alimentar a nível global.

CO12: CHILDREN'S DIETARY PATTERNS AT 4 YEARS: ARE THEY ASSOCIATED WITH APPETITE--RELATED EATING BEHAVIOURS AT 7 YEARS OLD?

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INTRODUCTION: Previous observational evidence, supported by plausible biological mechanisms, has highlighted a possible relation between children's dietary intake and certain aspects of eating behaviours, but most studies are cross-sectional and rely on single foods.

OBJECTIVES: To quantify the association between dietary patterns established at 4 years of age and eating behaviours related to appetite identified at 7 years of age.

METHODOLOGY: Participants are part of the Generation XXI population-based birth cohort (n=8647 children). Approximately 86% and 80% of all children participated in the follow-up assessments at 4 and at 7 years of age, where trained interviewers administered a structured questionnaire on socio-demographic characteristics, children's health and lifestyles. Children's and maternal anthropometrics were measured. Children's food intake at 4 years of age was assessed by a Food Frequency Questionnaire and 3 dietary patterns were identified by Latent Class Analysis: Healthier, Lower in Healthy Foods and Energy Dense Foods (EDF)-Dairy. A Portuguese version of the original Children's Eating Behaviour Questionnaire (CEBQ) was self-completed by mothers at 7 years old. This version has previously shown good psychometric properties and aggregated the 8 CEBQ sub-domains in 2 wider dimensions: Appetite Restraint (including the sub-domains Satiety Responsiveness, Slowness in Eating, Food Fussiness and Enjoyment of Food) and Appetite Disinhibition (including the sub-domains Food Responsiveness, Emotional Overeating, Emotional Undereating and Desire for Drinks). Generalized linear models were used to estimate the associations between children's dietary patterns and appetite-related eating behaviours, after adjustment for maternal characteristics. Interaction was tested and stratified analyses were further conducted.

RESULTS: In multivariate analysis, children belonging to the EDF-Dairy (β=0.072, 95%CI: 0.021; 0.124) and to the Lower in Healthy Foods pattern (β=0.139, 95%CI: 0.097; 0.182) scored higher on Appetite Restraint, compared with children in the Healthier dietary pattern. Scores in the Appetite Disinhibition dimension were increasingly higher in children following the Lower in Healthy Foods (β=0.072, 95%CI: 0.036; 0.107) and the EDF-Dairy (β=0.137, 95%CI: 0.093; 0.180) dietary patterns. An interaction effect between dietary patterns and children's waist circumference at 4 years old was found (p=0.020). Stratified analysis revealed that the positive association between the EDF-Dairy pattern and Appetite Restraint was only significant among children within the highest waist circumference tertile.

CONCLUSIONS: The Lower in Healthy Foods and the EDF-Dairy dietary patterns at 4 years of age, when compared with those in the Healthier dietary pattern, showed higher Appetite Restraint and Appetite Disinhibition scores at 7 years of age. It was also highlighted an interaction between dietary patterns and child's waist circumference at 4 years old on the Appetite Restraint dimension.

CO13: BIDIRECTIONAL ASSOCIATION BETWEEN PARENTAL CHILD-FEEDING PRACTICES AND BODY MASS INDEX AT 4 AND 7 YEAR-OLD

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INTRODUCTION: Evidence on the association of parental child-feeding practices with child's weight status is controversial and bidirectional effects have been poorly studied within the same population.

OBJECTIVES: We aimed to examine the bidirectional associations between parental child-feeding practices (restriction, monitoring, pressure to eat, overt and covert control) and body mass index (BMI) at 4 and 7 years of age.

METHODOLOGY: This study included 3708 singleton children from the Generation XXI birth cohort with data on parental child-feeding practices and body mass index at 4 and 7 year-old. Feeding practices were assessed through a self-administered questionnaire, adapted and validated to Portuguese pre-school children, that combines the Child Feeding Questionnaire and the Overt/Covert Control scale. Weight and height were measured according to standardized procedures, and BMI z-scores for sex and age were computed based on the World Health Organization Growth References. Linear regression models were run to estimate the bidirectional associations between BMI z-score and the mean score of each practice. Cross-lagged analyses were performed to compare both directions of those associations (BMI z-score and the mean score of each practice at both ages were standardized to enable effect size comparisons).

RESULTS: A higher BMI z-score at 4 year-old was significantly associated with higher levels of restriction and covert control at 7 year-old (restriction: β=0.056 95%CI 0.033, 0.079; covert control: β=0.060 95%CI 0.037, 0.083). Overt control at 4 years old predicted lower BMI z-score at 7 years old (β=-0.049 95%CI -0.088,-0.010). For pressure to eat, a bidirectional association was found, but the BMI z-score at 4 years strongly influenced the parental practice at 7 years of age (βstandardized=-0.17 *vs.* βstandardized=-0.04; Likelihood-Ratio Test: p<0.001). Monitoring showed no association with BMI z-score.

CONCLUSIONS: Parents tend to exert restriction and covert control in response

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