

Conclusion A high fruit and vegetable intake may help preserve cognitive function in the elderly, but education is a powerful confounder and may play an important role, especially in a low-income population.

P2-237 **β -CAROTENE IS ASSOCIATED WITH REDUCED RISK OF COGNITIVE FUNCTION IN LOW- INCOME ELDERLY FROM SÃO PAULO, BRAZIL**

doi:10.1136/jech.2011.142976j.70

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Introduction The influence of individual antioxidant vitamins on cognitive function in older adults remains uncertain. Randomised trials of dietary interventions have yielded mixed findings. We examined the relation between dietary carotenoids and vitamin C intake from fruit and vegetables and the cognitive function of a low-income population from Sao Paulo.

Methods Cross-sectional analyses of 1849 elderly ≥ 65 years old, free of dementia, at the baseline of the SPAH study. We estimated the usual intake of vitamin C, α -carotene, β -carotene, β -cryptoxanthin, lycopene, lutein and zeaxanthin by means of a Willet-like FFQ. Cognition function was assessed using the Community Screening Instrument for Dementia (CSI-D) (scored as 0–30). Few cases with score = 0 were excluded. The association between cognitive function and the intake of each antioxidant was investigated using multiple linear regression models.

Results After adjusting for age, gender, education, per capita income, physical activity, HDL-cholesterol, hypertension, stroke, smoking, alcohol consumption and BMI higher β -carotene intake was associated with higher cognitive function scores ($\beta=0.2$; 95% CI 0.1 to 0.3; $p<0.001$ for 1 mg of β -carotene); that is, those participants in the highest quartile of β -carotene intake (3.2–7.2 mg/d) had a mean increased of almost 1 point in their cognitive function scores compared to those in the lowest quartile (0–0.9 mg/d), ($\beta=0.95$; 95% CI 0.52 to 1.11; $p<0.001$). None of the others antioxidants were associated to cognitive function.

Conclusions Higher intakes of β -carotene were associated to better scores of cognitive function in a low-income Brazilian population.

P2-238 **A HIGH FRUIT AND VEGETABLE INTAKE IS ASSOCIATED WITH A REDUCED RISK OF CATARACT IN THE SPANISH EUREYE STUDY**

doi:10.1136/jech.2011.142976j.71

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Introduction Cataract is among the major causes of vision impairment and blindness worldwide. Epidemiological studies support the role of antioxidants in the aetiology of cataract, but the evidence for one specific antioxidant over another is inconsistent. We examined the associations between cataract and fruit and vegetable intake and dietary and blood levels of carotenoids, vitamin A, C and E.

Methods Cross-sectional population-based study with 583 elderly ≥ 65 , from Alicante province, participants of the European multicentre EUREYE study. Cataracts were diagnosed using a slit-lamp examination. Energy-adjusted intake of antioxidant vitamins was estimated using a semi-quantitative food frequency questionnaire. Plasma concentrations of vitamin C were analysed by a colouri-

metric method and carotenoids by a HPLC method. The associations between cataract and quartiles of fruit and vegetable intake and antioxidants were investigated using multiple logistic regression models.

Results After adjusting for other factors, participants in the highest quartile of fruit and vegetable intake (>575 g/day) had a reduced risk of cataract, (OR=0.42; 95% CI 0.23 to 0.79; p -trend <0.001). Intakes of vitamin C of 143–408 mg/d, and vitamin E of 9.3–10.7 mg/day, showed a significant lower risk of cataract, (OR=0.34; 95% CI 0.14 to 0.82) and (OR=0.41; 95% CI 0.20 to 0.82), respectively. Plasma α -tocopherol levels from 31.2 μ mol/l were also associated with a decreased risk (OR=0.30; 95% CI 0.15 to 0.60).

Conclusions High intake of fruit and vegetables, vitamin E and C was associated with a significantly decreased risk of cataract in this older Mediterranean population.

P2-239 **ASSOCIATIONS BETWEEN SEX HORMONES AND BONE MINERAL DENSITY AND BONE RESORPTION IN 50-YEAR-OLD MEN: THE NEWCASTLE THOUSAND FAMILIES STUDY**

doi:10.1136/jech.2011.142976j.72

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Introduction While much research relating sex hormones to bone health has centred on oestrogen deficiency in postmenopausal women, far less is known regarding the potential for sex hormone levels to influence bone health in men. We investigated the influence of sex hormone concentrations on bone health in men at age 50, using data from the Newcastle Thousand Families Study.

Methods The study included 171 men who attended for DEXA scanning (giving measures of bone mineral density (BMD) for the hip and lumbar spine) and also gave blood samples allowing measurement of concentrations of testosterone, oestradiol, sex hormone binding globulin (SHBG), free androgen index (FAI), free oestrogen index (FEI), luteinising hormone (LH), follicle stimulating hormone (FSH), free testosterone and serum β C-telopeptide of type 1 collagen (CTX), a biochemical marker of bone resorption.

Results There were significant correlations between total hip BMD and FEI ($p=0.03$), total spine BMD and SHBG ($p=0.006$), FEI ($p=0.008$) and FAI ($p=0.008$) and serum CTX and free testosterone ($p=0.016$). After adjustment for body weight the only associations that remained were between total spine BMD and FAI ($p=0.046$) and between serum CTX and free testosterone ($p=0.014$).

Conclusions Our results suggest that while there are associations between serum sex hormone concentrations and BMD, they are mostly explained by an adjustment for contemporary body weight. The inverse association between serum CTX and free testosterone is more robust, remaining significant after adjustment. This suggests that free testosterone levels are independently associated with bone resorption levels.

P2-240 **TIME TRENDS IN MORTALITY FROM CARDIOVASCULAR DISEASES AND CANCER IN PORTUGAL BETWEEN 1985 AND 2005**

doi:10.1136/jech.2011.142976j.73

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Introduction We aim to describe time trends in death rates from cardiovascular diseases (CVD) and cancer in the Portuguese

population in 1985–2005 and to quantify the contribution of variation in population's size and age structure, and risk to the change in number of deaths.

Methods The number of deaths from CVD (CID10: I00-I99) and all malignant tumours (CID10: C00-C99) and the population, by sex and age, were obtained from official statistics. We standardised mortality rates (direct method, European population) and used *joinpoint* analysis to identify changes in trends and to estimate the annual percent change (APC) of the standardised rate. We used the tool RiskDiff to quantify the contribution of risk, size and structure of the population during the periods with constant log-linear trend.

Results Mortality from CVD declined since 1985, most sharply since 1993 (men: APC=−4.0%, 95% CI −3.5 to −4.6; women: APC=−3.8%, 95% CI −3.1 to −4.4). The increasing population and its ageing explain a 30% increase in the number of deaths. The risk reduction explains a reduction by half, resulting in fewer deaths from CVD (men: −24%, women: −17%). Mortality from malignant tumours significantly increased until 1996 in men (APC=0.8%, 95% CI 0.5 to 1.1). Since 1996 in men and 1991 in women, despite the growing number of deaths (men: 13%, women: 16%), the risk is declining as illustrated by decreasing standardised mortality rates (men: APC=−0.4%, 95% CI −0.7 to −0.1; women: APC=−0.8%, 95% CI −0.9 to −0.6).

Conclusion In Portugal, the risk of death from CVD and cancer is decreasing, although this is reflected in fewer deaths only for CVD.

P2-241 EVALUATION OF THE NATIONAL CERVICAL SCREENING PROGRAMME IN CHILE

doi:10.1136/jech.2011.142976j.74

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Introduction The Chilean Cervical Screening Programme (CCSP) was implemented nationally in 1994, but its performance and effectiveness in reducing mortality from cervical cancer (CC) have not been assessed at an individual level. This is the first comprehensive evaluation of a national screening programme in a developing country based on individual record-linkage.

Methods We linked three Chilean national datasets using the unique personal identification number: (1) the National Health Service (NHS) dataset, which holds data on all women registered in the public health sector; (2) the Cito-Expert dataset, which contains all NHS screening records; and (3) national data on underlying causes of all deaths. This linkage provided a retrospective cohort of 2.8 million women aged 25–64 years followed from 1997 to 2007. The CCSP was assessed in terms of its performance and effectiveness in reducing CC mortality.

Results About 30% of the women in the cohort were never screened during the study period in the public health sector. The 5-year coverage was ~60%, with over-screening in specific subgroups, and ~60–70% of LSIL+ smears had three following normal smears within 48 months. Women ever screened had a 30% reduction in CC mortality relative to those who had never been screened (adjusted rate ratio: 0.7, 95% CI 0.6 to 0.8). The effectiveness of the programme was higher in middle-aged women (35–54 years) and in the lowest socioeconomic group.

Discussion The CCSP has reduced CC mortality during the last decade, but its impact could be increased by improving coverage and follow-up of abnormal smears.

P2-242 TOOTH LOSS IS ASSOCIATED WITH INCREASED BLOOD PRESSURE IN ADULTS: A BRAZILIAN POPULATION-BASED STUDY

doi:10.1136/jech.2011.142976j.75

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Introduction In addition to well-known risk factors, markers of dental disease and inflammation, such as tooth loss, are suggested to be also independently associated with blood pressure.

Objectives To investigate whether tooth loss is associated with increased blood pressure among adults, independently of the established risk factors.

Methods A population-based cross-sectional study was carried out with a sample of 1720 adults from Florianópolis, Brazil. Data collection included blood pressure, anthropometric measures and a questionnaire on socio-demographics, self-rated health, diabetes, self-reported number of natural teeth and dental prosthesis. We used multivariable regression models for the association between systolic blood pressure (SBP), diastolic blood pressure (DBP) and high levels of blood pressure (HBP) and tooth loss, sequentially adjusting for socio-demographic, behavioural and health related confounders.

Results Adjusted analysis revealed a Prevalence Ratio of HBP of 1.42 (95% CI 1.15 to 1.75) and 1.06 (95% CI 0.91 to 1.24) for edentate adults and adults with <10 teeth in at least one arch respectively, compared to those with 10 or more teeth in both arches. An association between edentate men and SBP was observed in the unadjusted but not the adjusted analysis. However, among women, edentate participants showed significantly higher SBP when compared with those with 10 or more teeth in both arches, after adjusting for potential confounders.

Conclusions There is an association between tooth loss and increased blood pressure and high levels of blood pressure in the general adult population of Florianópolis, especially among women, in addition to well-known hypertension risk factors.

P2-243 THE PROTECTIVE EFFECT OF PREDOMINANT AND EXCLUSIVE BREASTFEEDING ON MALOCCLUSION: RESULTS FROM A BRAZILIAN BIRTH COHORT

doi:10.1136/jech.2011.142976j.76

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Introduction There is a lack of evidence supporting the protective effect of breastfeeding on occlusion in primary dentition. The aim of this study was to examine the effects of predominant (PB) and exclusive breastfeeding (EB) on malocclusion adjusting for recognised risk factors.

Methods A cross-sectional study was carried out nested in a population-based birth cohort from Pelotas, Brazil which started in 2004. A sample of 1129 children aged 5 years old underwent dental examination. Anterior open bite, posterior cross bite, canines relationship, and overjet, were recorded according (1) Foster-Hamilton criteria and (2) WHO criteria. A history of breastfeeding and non-nutritive sucking habits was collected at interview with the child's mother. Data were analysed using multivariable Poisson regression controlling for potential confounders.

Results The mean duration of EB and PB were higher among children free of malocclusions; the longer the duration of breastfeeding,