Non-communicable Diseases 3

Chairpersons: CJ Hospedales, T Hassell

O – 56

Do neighbourhood environments contribute to ethnic differences in obesity, physical activity and dietary habits?

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Objective: To examine whether ethnic differences in physical activity (PA), fruit and vegetable consumption and body size are related to density of local food outlets and PA facilities.
Design and Methods: Individual data from the Health Surveys for England (1999, 2004) were linked to area-level data on crime and deprivation (Index of Multiple Deprivation domains), on ethnic density (2001 Census), and on density of fast food outlets, supermarkets, indoor and outdoor PA facilities (published lists). Multilevel modelling was used to examine the association between density of food outlets and PA facilities and PA (≥ 30 minutes or not of moderate/vigorous), fruit and vegetable consumption (≥ 5 portions or not) and body mass index (BMI), overweight and obesity in Whites, Black Caribbean, Black African, Indian, Pakistani, Bangladeshi, Chinese and Irish groups. All models were adjusted for area characteristics and individual socio-economic circumstances.
Results: Within each ethnic group, neither fast food outlets, supermarkets nor PA facilities was associated with fruit and vegetable consumption, or body size. The density of indoor 1.22 (95% CI 1.02, 1.45) and outdoor 0.79 (0.65, 0.96) PA facilities was associated with meeting PA level only among the Chinese. Individual socio-economic factors played a significant role in patterning risk for some ethnic groups.
Conclusions: In general, ethnic differences in PA, fruit and vegetable consumption or body size were not associated with the density of food outlets and PA facilities in neighbourhoods.

O – 57

Approaches to the early detection of breast cancer in a middle income country: Rates and determinants of self, clinical and radiographic breast examination in Dominica

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Objective: To determine the frequency and determinants of self, clinical and radiographic examination in Dominica to inform breast cancer mortality prevention and early detection policies.
Design and Methods: A population-based, random sample of 150 women, aged 40 to 69 years, was selected from the Portsmouth Health District. Data were collected from participants by interview regarding the conduct of at least monthly breast self-examination (BSE), clinical breast examination (CBE) within the past 12 months and mammography within the past three years.
Results: The response rate was 90.5% (136 women). Breast self-examination was reported by 52.2% (95% CI 43.8, 60.6), CBE by 52.9% (95% CI 44.5, 61.3) and mammography by 30.8% (95% CI 23.0, 38.6). Age was significantly ($p < 0.05$) related to frequency of mammography but not to BSE or CBE. There were no urban *vs* rural differences. However, higher frequencies of breast examination were significantly and independently related to higher educational levels and household income. For example, frequencies in women whose highest level of education was primary school *vs* higher levels of education were: BSE, 44.7% *vs* 69.0%, CBE, 45.7% *vs* 69.0, mammography 22.3% *vs* 50% (all p-values ≤ 0.019).
Conclusions: The primary healthcare system in Dominica offers free access to CBE and training in conduct of BSE/awareness as means to foster early detection of breast cancer in Dominica. This study's findings indicated that priority should be given to increasing the coverage of CBE, especially in women of lower socio-economic status.

O – 58

Is calcium associated with risk of prostate cancer in Jamaican men?

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Objective: Calcium has been hypothesized to enhance prostate cancer risk. In this study, we determine the relationship of both serum calcium and dietary calcium intake with prostate cancer.
Design and Methods: This was a case-control study of 210 men 40–80 years old with newly diagnosed, histologically confirmed prostate cancer (PCa) and 214 controls attending the same urology clinics. Diet was assessed by food frequency questionnaire and serum calcium concentrations were measured on an Abbott C8000 by the Arsenazo 111 method.
Results: There were no differences in educational achievement, physical activity or supplement use with increasing serum calcium, however, men in the highest serum calcium tertile had the lowest mean body mass index (BMI). Mean serum calcium concentrations was higher among cases (2.32 ± 0.19 mmol/L) than controls (2.27 ± 0.30 mmol/L) [p=0.023]; however, there were no differences in dietary calcium intake by cancer status (cases, 986 ± 391 mg/day; controls (1014 ± 398 mg/day). Multivariate analysis adjusted for age, education, physical activity, family history of prostate cancer and obesity showed that compared to those in the lowest serum calcium tertile, there was an increased risk of low grade prostate cancer only in men in the second serum calcium tertile (OR, 2.85; CI 1.16, 7.01) but not in the other group (OR, 2.08; CI 0.90, 4.81). Serum calcium showed no relationship with total or high-grade prostate cancer. Dietary calcium intake was not associated with high or low grade prostate cancer.
Conclusion: Serum and dietary calcium intake were unrelated to prostate cancer in Jamaican men.

O – 59

Sexual behaviours and urologic characteristics associated with prostate cancer risk in Barbados

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Objective: To evaluate the urologic characteristics and sexual behaviours of men with histologically confirmed prostate cancer (PC; cases) and age-matched controls in the Prostate Cancer in a Black Population (PCBP) study, conducted in Barbados.
Design and Methods: A nationwide, prospective case-control study with PC cases histologically confirmed and evaluated at the country's only Pathology Department, between July 2002 and January 2011 was conducted. Age-matched controls were randomly selected from an electronic database of Barbadian citizens and permanent residents. A total of 1007 (80%) and 1005 (75%) cases and controls, respectively participated. Urologic characteristics and sexual risk behaviours (sexually transmitted infection (STI), age at first sexual intercourse, and number of partners) were based on self-report. Prostate cancer tumours were histologically graded according to Gleason score. Differences between cases and controls were evaluated using t-tests and Chi-square tests and adjusted logistic regression analyses.
Results: Cases were 1½ to 3 times more likely to report symptoms of prostatic enlargement, haematuria/haematospermia, and previous prostatitis than controls. Sexually transmitted infections were reported by 24.5% of cases and 26.7% of controls. First sexual intercourse (< 16 years) was associated with an increased likelihood of both low (Gleason score < 7; OR 1.63; 95% CI: 1.03, 1.66) and high grade PC (Gleason score ≥ 7; OR 1.82; 95% CI: 1.11, 2.99). More lifetime sexual partners was associated with increased odds of high grade PC (p-trend = 0.02).
Conclusions: Associations between sexual behaviours and PC are likely due to multiple mechanisms. Further study will be necessary to elucidate the underlying pathophysiologic mechanisms in this population.

O – 60

The prostate cancer screening controversy: Justification for screening in Tobago and in similar Afro-Caribbean/African populations

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Background: In 2012, the US Preventive Services Task Force recommended that prostate cancer screening should be discontinued based on negative results from two large studies conducted in the United States of America (USA) and Europe. Both were done in settings of low incidence and mortality.

Design and Methods: In 1998, a population based study of men aged 40–79 years was done in Tobago with a response rate of 63%, based on the 1990 census. Risk factor questionnaire, serum, blood, and digital rectal examinations were evaluated. Sextant ultrasound guided biopsies were offered to respondents with levels of prostate-specific antigen (PSA) >/ 4 ng/ml or of digital rectal findings other than simple enlargement. The population was 94% African descent.
Results: Screening-detected prevalence was 11% (95% CI 10.2, 11.8) in men across the 40–79-year age group and 16% (95% CI 14.9, 18.2) in men across the 50–79-year age group. Prostate cancer was diagnosed in 42% (339/810) of the biopsied men. Screening-detected incidence was considerably higher in all age groups than in other populations.
Discussion: The screening-detected prevalence and incidence rates were higher than that of most countries. Our unpublished data suggest that the mortality rates for prostate cancer are also higher than recorded for white populations. The World Health Organization (WHO) age-adjusted mortality rates for Trinidad and Tobago and several African countries are higher than in most other countries.
Conclusion: Our thesis is that the US policy may not hold for countries with high prevalence, incidence and high age standardized mortality rates for prostate cancer.

O – 61
Fifteen year preliminary mortality follow-up of the Tobago Prostate Cancer Survey

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Objective: To assess age-specific all-cause mortality patterns in a population based prostate cancer screening programme on the island of Tobago.
Design and Methods: 3090 men, aged 40–79 years, were screened (serum prostate specific antigen and digital rectal examination) for prostate cancer one to three times between 1997 and 2007; 491 (16%) were diagnosed with prostate cancer. Ninety-two younger men underwent radical retropubic prostatectomy by volunteer surgical teams from the University of Pittsburgh. Other treatment was sporadic until recent years. Death certificates (n = 350) for the cohort were collected in the summer of 2012. Age-specific mortality rates were calculated using person years of follow-up. Survival tables for men with and without prostate cancer diagnosis were calculated by age group at first screening.
Results: There was no peri-surgery mortality. Six men died 3–9 years post-surgery: three to prostate cancer, three to other causes. Age-specific all-cause mortality rates ranged from 17 to 1074/100 000 in men aged 50–59 to 80–89 years at death, respectively. Differences in survival rates between men diagnosed with, and those without, prostate cancer were not observed until after eight years of follow-up in men screened age 60–69, and 12 years in men 70–79 years. In contrast, survival curves diverged much earlier in younger men, with increased mortality starting at four years follow-up in the age groups 40–49 and 50–59 years.
Conclusion: In this high risk population, screening diagnosis of prostate cancer may provide minimal survival benefit to men over the age of 60 years, but appears to save many years of life in men screened at younger ages.

O – 62
Arterial calcification in Afro-Caribbean men from Tobago

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Objective: To describe prevalence and characteristics of coronary artery and abdominal aortoilliac calcified plaque in a preliminary analysis of 273 Afro-Caribbean men from Tobago.
Designs and Methods: The Tobago Bone Health Study is a population-based prospective cohort study of men aged > 40 years from Tobago. At an ancillary visit, men were recruited consecutively for computerized tomography (CT) assessment. Calcified plaque was measured with non-contrast, non-electrocardiogram (ECG) gated CT of the coronary arteries (CAC) and the abdominal aorta and common iliacs (AAC) arteries. The Agatston method was used to score calcification with presence and severe calcification defined by a score of > 0 and > 400, respectively.
Results: Men were aged 63 years on average (range 40–90). Abdominal aorta and common iliacs was present in 72.8% of men and was severe in 34.2%. Median detectable AAC score was 302.2 (IQR 62.2–1046.8); CAC was present in 36.8% of men and was severe in 5.2%. Median detectable CAC score was 58.9 (17.3–229.7). Age was a strong predictor of both AAC and CAC, conferring two to three times increased odds of having calcified plaque per 7.8-year greater age ($p < 0.05$). After adjustment for age, increased body mass index (BMI), waist circumference, hypertension and smoking were associated with increased odds of calcification (smoking, AAC only).
Conclusions: Compared to previous reports in African American men, the prevalence of CAC is more than 10% lower, while AAC prevalence is similar or greater in these

Afro-Caribbean men. These data need to be expanded in this and other Caribbean samples to better understand the impact of ethnicity and environment on calcified plaque.

O – 63

Natural history and magnitude of changes in skeletal muscle adipose tissue infiltration with ageing in Afro-Caribbean men: Longitudinal data from the Tobago Health Study

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Objective: Skeletal muscle adipose tissue (AT) infiltration is an ectopic fat depot that may play an important role in the development of Type 2 diabetes (T2D), and is greater in African compared with European ancestry men. Longitudinal studies examining the natural history, magnitude of changes in skeletal muscle AT infiltration with ageing, and its consequences are lacking, particularly in African ancestry individuals.
Designs and Methods: We examined longitudinal changes in general body mass index (BMI) and dual-energy X-ray absorptiometry (DXA) total body fat, central (DXA trunk fat), and computed tomography measured calf skeletal muscle adiposity [total, subcutaneous, and intermuscular AT; and muscle attenuation (reflects intramuscular AT, fat within the myocytes)] in 846 Afro-Caribbean men aged 40 to 81 years.
Results: During the six years follow-up, we observed a significant overall and annualized percentage increase in all adiposity phenotypes (all $p < 0.001$), except for BMI. Decrease in muscle attenuation accelerated with increasing age: -0.24%, -0.34% and -0.64% per year among men aged 40–54 years, 55–64 years, and 65+ years, respectively (p for trend < 0.0001). Importantly, decrease in muscle attenuation was correlated with increase in fasting glucose ($r = -0.17$; $p = 0.005$).
Conclusions: Our findings show for the first time that in men of African ancestry, the accumulation of AT within skeletal muscle accelerates with ageing, and may contribute to ageing-related hyperglycaemia, independent of total adiposity. These results suggest that skeletal muscle AT infiltration may be a novel T2D risk factor that may explain ethnic differences in T2D risk, and provide new insight into the pathophysiology of T2D

O – 64

Glomerular filtration rate estimating equations in SS disease

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Objective: The unique renal physiological and pathological processes that occur in sickle cell disease (SCD) may invalidate current glomerular filtration rate (GFR) estimating equations in them. This study aims to compare the utility of existing equations to measure GFR in persons with homozygous SCD. If the existing equations perform poorly, we propose to develop new estimating equations for SCD.
Design and Methods: Ninety-eight patients with the homozygous SS disease (55 females, 43 males; mean age 34 ± 2.3 years) had measurements of serum creatinine and Cystatin C, as well as had GFR measured using technetium 99m-labelled diethylenetriamine penta-acetic acid (^{99m}Tc-DTPA) nuclear renal scan. The Bland-Altman limit of agreement method was used to determine agreement between measured and estimated GFR values. Linear regressions were used to construct GFR predictive models using serum creatinine, Cystatin C and height as predictor variables.
Results: The mean measured GFR ± SD was 94.9 ± 27.4 mls/min/1.73m^2 body surface area (BSA) [range 6.4–159.0 mls/min/1.73m^2]. The currently utilized equations all overestimated GFR, the agreement worsening with higher GFR values. Serum creatinine based chronic kidney disease epidemiology collaboration (CKD-EPI) equation performed the best but with a systematic bias of about 45 mls/min. Three GFR estimating equations were constructed using available data, based on serum creatinine, serum Cystatin C, and a combination of both. The accuracy of these equations was approximately 83%, 84% and 87%, respectively.
Conclusions: Current estimating equations, other than the CKD-EPI equations, do not perform well in persons with homozygous SS disease. Fairly accurate estimating equations have been developed from our dataset using serum creatinine, serum Cystatin C and a combination of both.