

P58 DEVELOPMENTAL AND ADULT RISK FACTORS ASSOCIATED WITH DECLINE IN GRIP STRENGTH FROM MIDLIFE TO OLD AGE: A BRITISH BIRTH COHORT STUDY

D Kuh, R Hardy, JM Blodgett*, R Cooper. *MRC Unit for Lifelong Health and Ageing, University College London, London, UK*

10.1136/jech-2018-SSMabstracts.181

Background Maintenance of muscle strength with age enables independent living for longer and may protect against chronic disease. Developmental and adult factors are associated with level of adult grip strength but evidence about their influence on its decline is sparse. We used longitudinal data to test whether birthweight, motor and cognitive development and patterns of pubertal growth were associated with trajectories of adult grip strength, and operated independently or on the same pathways as adult factors.

Methods The sample comprised 3058 men and women (6975 observations) in the MRC National Survey of Health and Development, a population-based British birth cohort study with up to three measures of grip strength from 53 to 69 years. Developmental factors included birthweight, maternal reports of motor milestone attainment, childhood cognitive test scores, and growth parameters of size, tempo and velocity. Covariates included lifetime social class, and adult height, BMI, verbal memory test scores, educational qualifications, health conditions and behaviours. We fitted multilevel models with the intercept and slope as random effects, included a linear age term, controlled for adult height and tested for age and sex interactions with each factor; then adjusted the developmental factors for each adult factor.

Results In men, heavier birthweight and childhood weight, beginning to walk 'on time', and later puberty, and in women, earlier age at first standing, were associated with stronger grip strength (but not its decline) independently of other developmental and adult factors. In women, there was an association between higher childhood cognition and stronger grip strength (but not its decline) which was attenuated by education. Men of higher childhood cognition showed a slower decline in grip strength (by 0.068 kg/year, 95% confidence interval (CI) 0.024, 0.11 per 1SD, $p=0.003$): this latter association was attenuated by adult verbal memory which became increasingly positively associated with grip strength at later ages (by 0.10 kg/year, 95% CI 0.061, 0.15 per 1SD, $p<0.001$). In contrast, the positive association between adult BMI and grip strength in men weakened (by -0.057 kg/year, 95% CI $-0.11, -0.0056$ per 1SD, $p=0.03$).

Conclusion Patterns of growth, motor development and lifetime cognition have persisting associations with grip strength between midlife and old age. Associations with cognition strengthened over this 16 year period suggesting that grip strength increasingly reflects neural ageing processes. Interventions that promote muscle development by targeting developmental factors, or maintain muscle strength by targeting adult risk factors should increase the chance of an independent old age.

P59 RISK FACTORS FOR INCIDENT FALLS IN OLDER MEN AND WOMEN: FINDINGS FROM THE ENGLISH LONGITUDINAL STUDY OF AGEING

LD Westbury*, CR Gale, C Cooper, EM Dennison. *MRC Lifecourse Epidemiology Unit, University of Southampton, Southampton, UK*

10.1136/jech-2018-SSMabstracts.182

Background Falls are a major cause of disability and death among older people, particularly women. Cross-sectional surveys suggest that some risk factors associated with a history of falls may be sex-specific but whether risk factors for incident falls differ between the sexes is unclear. This study investigated risk factors for incident falls and whether they differ between men and women.

Methods Participants were 3298 men and women (aged 60 years and over at Wave 4) who took part in the Waves 4–6 surveys of the English Longitudinal Study of Ageing. At Wave 4, they provided information on previous falls, sociodemographic, lifestyle, behavioural and medical factors, and had their physical and cognitive function assessed. Data on self-reported incident falls during the four-year follow-up period were collected at Waves 5 and 6. Relative risks (RR) for the association between baseline characteristics and incident falls were derived using sex-specific Poisson regression models with robust variance estimation. Factors associated with falling ($p<0.20$) were included in sex-specific mutually-adjusted models. Analyses were performed among men and women separately and relative risks were adjusted for previous falls before Wave 4.

Results Overall, 633 (41.8%) men and 863 (48.4%) women experienced an incident fall between Waves 4 and 6. In mutually-adjusted models, older age was the only factor associated with increased risk of incident falls in both sexes. Some factors were only predictive of falls in one sex, namely more depressive symptoms (RR (95% CI) 1.03 (1.01, 1.06)), incontinence (1.11 (1.00, 1.24)) and never having married in women

(1.26 (1.03,1.53)), and greater comorbidity (1.05 (1.00,1.09)), higher levels of pain (1.11 (1.04,1.18)) and poorer balance (1.25 (1.05,1.49)) in men. Of these, only the relationships between pain, balance and comorbidity and falls risk differed significantly ($p < 0.05$) by gender according to interaction tests. **Conclusion** Older age was associated with increased risk of incident falls in both sexes. However, associations regarding pain, balance and comorbidity differed by gender. Strengths of the study include the large sample size and the fact that it is representative of the community-dwelling English population aged 60 years and over. However, one potential weakness is that there was no definition in the questionnaire of what constituted a fall. This research will inform the development of interventions to reduce the risk of falls among older people.

P60 ALCOHOL CONSUMPTION AND RISK OF INCIDENT FRAILITY: THE ENGLISH LONGITUDINAL STUDY OF AGEING

¹G Kojima*, ²S Jivraj, ¹S Iliffe, ¹A Liljas, ¹K Walters. ¹Department of Primary Care and Population Health, University College London, London, UK; ²Department of Epidemiology and Public Health, University College London, London, UK

10.1136/jech-2018-SSMabstracts.183

Background Frailty is recognised as an important public health concern among older people due to its detrimental consequences on health. Alcohol consumption may be a plausible risk factor for frailty. There is only limited evidence in the literature on association between alcohol and frailty, which is still controversial. Therefore we investigated the relationship between alcohol consumption and the risk of incident frailty.

Methods A total of 2544 community-dwelling older people aged ≥ 60 years from the English Longitudinal Study of Ageing were followed for incident frailty over four years according to alcohol consumption. Frailty was defined using Fried frailty phenotype criteria with slight modification according to data availability. Questionnaire data on alcohol consumption was grouped into non-drinkers, $>0-7$ units/week, $>7-14$ units/week, $>14-21$ units/week, >21 units/week. Multivariable logistic regression models were used to examine incident frailty risk.

Results Compared with those drinking $>0-7$ units per week (reference), those drinking >21 units per week were less likely to develop frailty (Odds ratio (OR)=0.45, 95% confidence interval (CI)=0.27–0.73, $p < 0.001$) in the unadjusted model, however the association became non-significant in the fully adjusted model controlling for age, gender, smoking, education and wealth (OR=0.65, 95% CI 0.38 to 1.11, $p = 0.12$). There was no significant difference in incident frailty risk in those drinking $>7-14$ and $>14-21$ units per week compared to $>0-7$ units per week in any models. Non-drinkers had worse health profile and higher incident frailty risk than drinkers (fully adjusted OR=1.63, 95% CI 1.07 to 2.48, $p = 0.02$).

Conclusion In this cohort non-drinkers had a significantly higher risk of developing frailty compared to light drinkers ($>0-7$ units per week). No significant associations were observed among drinkers. The true association between alcohol and frailty may have been affected by a 'sick-quitter'

effect (i.e. drinkers who are ill health tend to reduce or cease alcohol use), which should be addressed in future research.

P61 VITAMIN D DEFICIENCY, IMPAIRED LUNG FUNCTION AND TOTAL MORTALITY IN OLDER MEN: THE BRITISH REGIONAL HEART STUDY

¹SG Wannamethee*, ²Paul Welsh, ¹O Papacosta, ¹LT Lennon, ³PH Whincup. ¹Department Primary Care and Population Health, University College London, London, UK; ²Institute of Cardiovascular and Medical Sciences, BHF Glasgow Cardiovascular Research Centre, University of Glasgow, Glasgow, UK; ³Population Health Research Institute, St George's University of London, London, UK

10.1136/jech-2018-SSMabstracts.184

Background Chronic obstructive lung disease (COPD) is a common chronic inflammatory disease in the elderly and is a major cause of morbidity and mortality. Much attention has focussed on identifying factors which may influence prognosis and mortality in these patients. Although vitamin D deficiency is traditionally known for its role in bone health, there is growing interest in the role of vitamin D in COPD. Observational studies have found Vitamin D deficiency to be highly prevalent in patients with COPD. We have examined the association between vitamin D deficiency (ascertained from measuring the circulating 25-dehydroxyvitamin D [25OHD] metabolite) and lung function impairment and assessed whether vitamin D deficiency is related to long term mortality in those with impaired lung function.

Methods Prospective study of 3575 men aged 60–79 years with no prevalent HF followed up for 15 years, in whom there were 1937 deaths (80 COPD deaths). The Global Initiative on Obstructive Lung diseases (GOLD) spirometry criteria was used to define airway obstruction. Vitamin D deficiency was defined as serum 25OHD levels < 10 ng/ml; insufficiency as 25OHD 10–19 ng/mL; normal as 25OHD > 20 ng/mL.

Results Vitamin D deficiency was associated with moderate COPD (FEV/FVC $< 70\%$ and FEV1 50%–80%) and severe COPD (FEV/FVC $< 70\%$ and FEV1 $< 50\%$) but not with mild COPD (FEV/FVC $< 70\%$ and FEV1 $> 80\%$) or restrictive lung disease (FEV1/FVC $> 70\%$ and FVC $< 80\%$). Vitamin D deficiency was associated with significantly increased risk of total and COPD mortality in all men except those with severe COPD after adjustment for confounders. The adjusted HRs (95% CI) for total mortality comparing levels of 25OHD < 10 ng/mL to 25OHD > 20 ng/ml were 1.38 (1.10, 1.75), 1.62 (1.22, 2.15), 1.93 (1.32, 2.80) and 1.34 (0.78, 2.31) for those with none/mild COPD, restrictive lung function, moderate COPD and severe COPD respectively. The corresponding HRs (95% CI) for COPD deaths were 14.3 (2.45, 83.23), 5.10 (0.96, 27.06), 3.55 (1.12, 11.22) and 0.81 (0.25, 2.57) for the 4 groups respectively.

Conclusion Our findings suggest that older adults with vitamin D deficiency (< 10 ng/ml) and earlier stages of lung impairment may potentially benefit from vitamin D supplementation. Intervention trials in older people with mild or moderate impaired lung function are needed to confirm whether increasing vitamin D levels through supplements in those with vitamin D deficiency will reduce both risk of COPD deaths and overall mortality.