GENETIC VARIATION AND RESILIENCE IN HUMAN AGING: THE SAGA STUDY

CHAIR:
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The human ageing process shows great heterogeneity and inherited genetic variations are involved in a substantial part of the relative resilience of some people in the aging process. Genome wide studies have recently identified many new variants associated with relevant traits and diseases. This symposium will provide an overview of recent findings and discuss emerging work from the US National Institute on Aging’s Study of Aging and Genetic Association (SAGA). Areas of specific focus will include muscle strength, cognitive functioning and inflammatory processes. Findings point mainly to sets of moderate effect variants, with many more markers still to be discovered. Some variants are shedding new light on aging and disease mechanisms and on previously unsuspected parts of the genome.

STUDIES OF AGING AND GENETIC ASSOCIATION (SAGA): INTRODUCTION

In the last two years genome wide association studies have had a number of successes. These include identification of polymorphisms linked to lower risks of myocardial infarction, type 2 diabetes, to age related macular degeneration and to prostate cancer. The p15/p16 locus, IGF2 binding proteins and certain inflammatory genes have been prominent in the findings and of special relevance in aging. A GWA on quantitative traits of aging (The SAGA study) based on the US National Institute on Aging InCHIANTI and BLSA studies is now underway. This talk will provide an overview of findings across the field and will introduce recent work from SAGA.

GENETIC VARIATION AND MUSCLE STRENGTH

T. Tanaka, National Institute on Aging, Bethesda, MD

A decline in muscle strength is one of the hallmarks of aging. Poor muscle strength in middle age has been associated with functional limitations, morbidity and mortality in the aged population. Both environmental and genetic factors most likely contribute to determination of individual muscle strength. Twin studies have shown that the heritability of hand grip strength and lower extremity strength to be between 22-52% and 24-51% respectively. These studies support the notion that muscle strength is in part genetically determined. The SAGA study utilizes the whole genome data to investigate the loci associated with muscle strength in the InCHIANTI and Baltimore Longitudinal Studies of Aging. This study aims to identify genes that determine muscle strength, and to shed light as to whether there are a group of genes contributing to overall muscle strength or there are site-specific genes determining upper or lower extremity muscle strength.

COGNITIVE IMPAIRMENT AND AGING: BEYOND APOE

C. Cluett, Peninsula Medical School, Exeter, United Kingdom

Identifying the gene variants responsible has proved difficult. Recent genome wide association studies indicate that ApoE is probably the largest single effect variant, but that several other variants look possible. The SAGA study has used genome wide data from the InCHIANTI and Baltimore Longitudinal Studies of Aging, and has followed up several promising markers. Replication study populations include the MRC Cognitive Function and Ageing Study, the Oxford Healthy Ageing Project and the Longitudinal Aging Study Amsterdam. The collaborative group and others have now identified new polymorphisms associated with cognitive impairment in the general older population. Implications include the identification of new metabolic pathways involved in brain impairment with aging.

GENETIC VARIATION, INFLAMMATORY AND OTHER SERUM PROTEIN LEVELS

Genetic variation influences gene expression but the role of genetic variation in determining protein levels has not been systematically assessed. We performed a genome wide association study evaluating the role of 496,032 SNPs on levels of 42 proteins in 1200 individuals from InCHIANTI.
THE EFFECTS OF VOLUNTEERING ON THE PSYCHOLOGICAL WELL-BEING OF OLDER ADULTS
H. Jun, J. Yoon, B. Park,

The stereotype of older adults as burdensome and needy dependents has been persistent. But recent research has begun to document that older adults participate in a significant amount of productive activity. The potential benefits of productive activity to older adults themselves, however, have received relatively little attention. The main purpose of this study was to examine the impact of engagement in volunteering as one type of important productive activities on the psychological well-being of older adults. The subjects of this study were 198 volunteers living in Seoul who were between the age of 60 to 89 and who were respondents to both pre test and post test and who took part in volunteer work for two tests. The questionnaire included volunteer role items; a 10-item version of Rosenberg’s Self-Esteem index; a 12-item modified version of the Center for Epidemiological Depression (CES-D) index, a 5-item modified version of Dieners Satisfaction with Life Scale(SWLS), a 4-item modified version of Pearlin’s self-efficacy scale, and a 39-item version of leadership scale. In addition, numerous demographic background questions were asked. The data were analyzed using paired t-test. Result suggests that engagement in volunteering has positive effects on psychological well-being for older adults. Volunteering is positively associated with increase in life satisfaction and leadership, and decrease in depression.

CONTEXTUALIZING LEISURE TIME PHYSICAL ACTIVITY IN LATER LIFE
CHAIR:
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Leisure time physical activity (LTPA) plays an important role in multidimensional aspects of health and well-being in mid to late life. Examining physical activity across life domains extends our understanding of contributors of active and inactive lifestyles, and provides ideas for promoting physical activity at the individual and community levels. The first paper extends previous research to examine characteristics of volunteerism in relation to LTPA and health. This study found that only certain volunteerism characteristics were positively related to LTPA, and that LTPA and education were directly related to self-reported health. Using four waves of data from 1993 to 2008, the second paper explores continuity and change in images of physically active older adults in popular media. This paper highlights issues of representation and found that images of physically active older adults are still relatively absent. The third paper describes older women’s physical activity in the unique leisure context of outrigger canoeing, providing a lens into the role of LTPA in the gendered life course. The older women in this study described physical, emotional, and social benefits from their participation in active pursuits and described life events that either curtailed or promoted physical activity. These papers underscore the factors that both contribute and detract from older adults’ engagement in LTPA, and contextualize our understanding of active aging.

THE ROLE OF VOLUNTEERISM IN THE PHYSICAL ACTIVITY AND HEALTH OF ADULTS IN MID TO LATE LIFE
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The purpose of this study was to extend research examining the relationships between volunteerism characteristics, leisure time physical activity and health. A cross-sectional study of volunteers and visitors aged 50 and older at a Midwestern park district completed self-administered onsite questionnaires (N = 271). We examined a path model with LTPA, perceived physical health, and volunteer characteristics (volunteer duration, volunteer physical activity, and volunteer type), while controlling for age, income, education, and work status. Congruent with previous research, LTPA and education were positively related to physical health (r2 = .13, p < .001). Volunteer duration, volunteer physical activity, work status, and income were significantly related to LTPA (r2 = .16, p < .001). Age, volunteer duration, and income were related to volunteer physical activity (r2 = .26, p < .001). We discuss ways that park districts can maximize their volunteers’ opportunities to be physically active.

IMAGES OF PHYSICALLY ACTIVE OLDER ADULTS IN THE PRINT MEDIA: A LONGITUDINAL AND CRITICAL ANALYSIS
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This research explored continuity and change in images of physically active older adults in popular media (magazines) using 4 waves of data (1993-2008) and analyzing data by gender and race. This issue is significant in terms of concerns about the functional health of the increasing numbers of “older people” in the U.S. and the role of leisure-time physical activity in maintaining such health (Shephard, 1997). The study was informed by discourse on the meaning/fulness (Bytheway, 2000)/construction of age (Blakie 1999), and medias’ role in such meaning making (Robinson et al., 2008). Results showed that while some change has occurred over the past 15 years, older adults are under-represented in, and images of them as physically active are relatively absent from, magazine advertising (particularly older women and people of color). These findings may help explain older adults’ reports that lack of opportunity and