indoor mobility per se can reduce physical frailty and consequently helps to maintain autonomy. Conclusions: Indoor mobility captured by ADAMO accelerometer may be an important indicator of physical frailty and autonomy. ADAMO may be used as a non-intrusive telemonitoring solution to capture relevant information on individual general health in aged people.

A RANDOMIZED CONTROLLED TRIAL OF METFORMIN FOR FRAILTY PREVENTION: STUDY DESIGN AND BASELINE CHARACTERISTICS

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Inflammation and insulin resistance are major predictors of frailty. Here we describe the study design of an ongoing double-blind, randomized controlled trial of metformin for frailty prevention. Subjects are adults aged 65+ years with pre-diabetes assessed by 2-hour oral glucose tolerance test (OGTT). Those who are frail (Fried criteria) are excluded. Participants are randomized to metformin (maximum dose of 2,000 mg/day) vs. placebo and followed for 2 years. The primary outcome is frailty (category and score); secondary outcomes are physical performance and function (short physical performance battery, 6-minute walk, lower extremity strength), systemic and skeletal muscle tissue inflammation, muscle insulin signaling, insulin sensitivity (insulin clamp), glucose tolerance (OGTT), and body composition (dual-energy x-ray absorptiometry). Safety assessments occur every 3 months; frailty, systemic inflammation, and OGTT are assessed at baseline and every 6 months, and insulin clamp with muscle biopsies are assessed at baseline and every 12 months. To date, 51 subjects have been randomized; 120 completers are planned. Mean age is 73.4 ±5.7 years, 43% are female, and 39% Hispanic. Mean BMI is 30.5 ±5.5 kg/m2, waist circumference is 105 ±13.1 cm, fasting glucose is 102.3 ±8.8 mg/dL, Hemoglobin A1c is 5.8 ±0.3, and glucose at 2 hours during OGTT is 168.5 ±20.4 mg/dL. Metformin is being examined in this study as a potential therapeutic agent to prevent frailty in older adults with pre-diabetes. Findings from this trial may have future implications for the screening and potential treatment of pre-diabetes in older patients with metformin for the prevention of frailty.

HAS FRAILTY SCORE AND FRAILTY LETHALITY CHANGED OVER TIME? HARMONIZATION OF NHANES COHORTS FROM 1999 TO 2016

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Positive advances in life expectancy, healthcare access and medical technology have been accompanied by an increased prevalence of chronic diseases and substantial population ageing. How this impacts changes in both frailty level and subsequent mortality in recent decades are not well understood. We aimed to investigate how these factors changed over an 18-year period. Nine waves of the National Health and Nutrition Examination Survey (1999-2016) were harmonized to create a 46-item frailty index (FI) using self-reported and laboratory-based health deficits. Individuals aged 20+ were included in analyses (n=44086). Mortality was ascertained in December 2015. Weighted multilevel models estimated the effect of cohort on FI score in 10-year age-stratified groups. Cox proportional hazard models estimated if two or four-year mortality risk of frailty changed across the 1999-2012 cohorts. Mean FI score was 0.11±0.10. In the five older age groups (>40 years), later cohorts had higher frailty levels than did earlier cohorts. For example, in people aged 80+, each subsequent cohort had an estimated 0.007 (95%CI: 0.005, 0.009) higher FI score. However, in those aged 20-29, later cohorts had lower frailty [β=-0.0009 (-0.0013, -0.0005)]. Hazard ratios and cohort-frailty interactions indicated that there was no change in two or four-year lethality of FI score over time (i.e. two-year mortality: HR of 1.069 (1.055, 1.084) in 1999-2000 vs 1.061 (1.044, 1.077) in 2011-2012). Higher frailty levels in the most recent years in middle and older aged adults combined with unchanged frailty lethality suggests that the degree of frailty may continue to increase.

DOES GENDER INFLUENCE RISK FOR ORTHOSTATIC HYPOTENSION IN OLDER ADULTS WITH SARCOPENIA?

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Older adults with sarcopenia may be at risk for unstable postural blood pressure due to diminished lean mass that plays a role in maintaining fluid volume. Males have greater lean mass, so risk may be mediated by gender. We compared postural blood pressure changes in older men (77.1 ± 2.0 years; n = 15) and women (79.6 ± 2.0 years; n = 13) with sarcopenia before and after an overnight fast. Sarcopenia was defined using the Lean Mass Index (males ≤ 19.0 kg/m2; females ≤ 15.0 kg/m2). Body composition was measured using multi-frequency bioelectrical impedance, and blood pressure was measured lying, sitting, and standing. On Day 1 (normally hydrated) there were significant drops in systolic blood pressure, with an overall decrease of -9.1 ± 2.2 mmHg ($p < 0.001$) between lying and standing. On Day 2 (overnight fast), postural changes were more profound, with an overall decrease of -14.1 ± 2.8 mmHg ($p < 0.001$). However, when compared by gender, postural changes between lying and standing remained significant but did not differ between men and women (Day 1: men -8.9 ± 2.5 vs. women -9.3 ± 2.5 mmHg; Day 2: men -14.6 ± 4.6 vs. women -13.6 ± 3.1 mmHg). On both days diastolic blood pressure remained stable. In this group of older adults, significant decreases in postural systolic blood pressure were observed in the early morning fasted condition, increasing the risk for orthostatic hypotension (drop in systolic blood pressure -20.0 mmHg). Interestingly, gender did not influence risk.

RACIAL AND ETHNIC DIFFERENCES BETWEEN GRIP STRENGTH AND FUNCTIONAL LIMITATIONS: RESULTS FROM NHATS 2010-2014

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Current research regarding grip strength highlights the robustness of grip strength as a predictor of morbidity and mortality. The aim of this study was to evaluate the association of grip strength over four years with functional limitations among racially/ethnically diverse older adults. We analyzed National Health and Aging Trends Study (NHATS) data 2010-2014. Our sample included 4,413 adults > 65 years old. Functional limitation was defined as a sum of difficulty performing eight ADL/IADLs (range 0-8) at each wave. Grip strength was measured using a digital hand dynamometer and readings were recorded in kilograms (kg) (maximum of 32 kg for men and > 20 kg for women). We estimated stratified linear regression models by race/ethnicity and age, and adjusted for BMI, education, and gender. The majority of the sample was between 65-79 years of age (64%), 55.1% were female and the average BMI was 27.5. We found that differences in ADL/IADL limitations increased and grip strength decreased over the four year period of observation. We also found racial/ethnic differences between waves 1 and 4 with greater ADL/IADL limitations for Hispanics with lower grip strength scores compared to non-Hispanic whites. There were racial/ethnic differences in the association between grip strength and ADL/IADL over time in Non-Hispanic blacks and Hispanics when compared to Non-Hispanic whites. This is an important issue to address since loss of muscle strength in older adults may lead to several negative outcomes such as limited activities of daily living which may affect older adults differentially based on race/ethnicity.

ASSOCIATION BETWEEN FRAILTY AND DEVELOPMENT OF COGNITIVE IMPAIRMENT: EVIDENCE FROM THE HEALTH AND RETIREMENT STUDY

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Research has shown there is currently an increasing prevalence of cognitive impairment and dementia in older adults. To date, there remains a paucity of research to explain this increase and research on early markers and risk factors are warranted. This study aims to assess the association of cognitively normal older adults who are frail and the development of cognitive impairment four years later. Data from the Health and Retirement Study – a nationally representative sample of older US adults – was used from 2004-2008 for individuals 65 and older (n=8,377). Frailty was categorized by using Fried's phenotype model: individuals were grouped into frail, pre-frail, and robust. Cognitive impairment – a composite score that assessed memory recall and global mental status – was classified as scoring eight or less on a 35-point scale. After restricting to cognitively healthy individuals, logistic regression with weights was used to assess the association between frailty status and the development of cognitive impairment four years later. The model was adjusted for baseline age, gender, race, education years, smoking status, and chronic health issues (high blood pressure, diabetes, cancer, lung disease, heart disease, stroke, psychiatric problems, and arthritis). Frail individuals, compared to those who were robust, had increased odds of cognitive impairment (OR=1.74; 95% CI: 1.48-2.16), after fully adjusting. Evidence from this study suggest that frail individuals are more likely to become cognitively impaired over time. This provides a potential pathway of intervention to help delay or prevent the development of cognitive impairment in older US adults.

IMPACT OF HIGH BODY MASS INDEX ON FRAILTY AND MORTALITY IN MIDDLE-AGED AND OLDER ADULTS

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Obesity is associated with higher risk of metabolic diseases. How body mass index (BMI) relates to mortality across frailty levels is controversial. We investigated the association of high BMI with frailty, and their effects on mortality. We included 36,583 participants aged ≥50 years from the 1999-2006 National Health and Nutrition Examination Survey (NHANES) cohorts (7,372) and 29,211 participants aged ≥50 years from wave 1 (2004) of Survey of Health Ageing and Retirement in Europe (SHARE). BMI was categorized as: normal: 18.5-24.9 kg/m2, overweight: 25-29.9, obese I: 30-34.9 and obese II+III: >35. A frailty index (FI) was constructed excluding nutrition-related items using 36 items for NHANES and 68 items for SHARE. Mortality data were obtained until 2015. All analyses were adjusted for educational, marital, working and smoking status. In participant aged 50-65 years, higher BMI was associated with greater frailty. Being obese level II+III increased mortality risk in male participants aged 50-65 years with FI≤0.1 [NHANES (hazard ratio (HR) 2.10, 95%CI 1.17-3.79); SHARE (2.35,1.14-4.87)]. In males aged >65 years with FI>0.3, being overweight and obese (any level) decreased mortality risk. In females aged 50-65 years, higher BMI was not associated with mortality across all frailty levels. BMI and frailty were cross-sectionally associated. The subsequent mortality impact differed by age, sex, and frailty. Obesity was not associated with mortality in middle-aged females, regardless of the degree of frailty. In males, obesity was harmful in those who were fit in middle age and protective in moderately/severely frail older ones.

AN INNOVATIVE PLATFORM BASED ON WEARABLE SENSOR TO QUANTIFY FRAILTY PHENOTYPES

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This study evaluated an innovative wearable sensor based platform (instrumented trail-making task, iTMT) to quickly quantify frailty phenotypes, without the need of walking test. 61 older adults (age=72.8 ± 9.9years, BMI=27.4±4.9kg/m2) were recruited and assessed by Fried Frailty Criteria to determine frailty phenotypes. All subjects participated the iTMT test