TRANSLATING RESEARCH FINDINGS INTO AN EVIDENCED-BASED APPROACH TO IMPROVE HOSPITAL PRACTICES FOR MALNUTRITION

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Malnutrition is a common problem that often goes unrecognized. In a recent UTMB-OAIC funded pilot, we found 49% of older adults were at risk of malnutrition at hospital admission. Malnutrition is associated with increased length of stay, poorer patient outcomes, and higher risk of mortality. Also, malnutrition severity alters hospital reimbursement rates. In 2018, the UTMB health system recognized the need for institutional guidelines to help identify, diagnose, document, and code mild/moderate/severe malnutrition. At baseline, compared to similar academic medical centers, UTMB ranked in the bottom quartile for malnutrition diagnosis. A multidisciplinary committee formed with physicians, nurses, researchers, dieticians, coding, and information technology. Preliminary data from the pilot study found the Nutritional Risk Screen (NRS) had the best sensitivity, specificity, positive and negative predictive values. The NRS was made more user friendly with scripting/prompts in the electronic medical record (EMR) to improve consistency/compliance among nurses. The Subjective Global Assessment was used in EMR by dieticians to document malnutrition diagnosis. A Best Practice Advisory was created to give physicians the option to easily add malnutrition diagnosis to the problem list. Since "go-live" in February 2019, NRS completion improved from 10.6% to 70.0%. Coding of malnutrition increased from 3.7% to 5.8%. In a 6 month follow-up, 113 patients were found to have direct benefits from the new process, resulting in an estimated financial impact of $945,605. Going forward, we have identified multiple areas of continued education needs to further improve the implementation and uptake of the new screening tool and diagnostic processes.

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BIOLOGY OF AGING

ADIPOSITY IS POSITIVELY ASSOCIATED WITH AD-SIGNATURE CORTICAL THICKNESS IN OLDER ADULTS

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Mid-life obesity is associated with a higher risk for Alzheimer's disease (AD). However, this association is attenuated or even reversed in late-life, when weight loss may be a preclinical sign of AD. While neuropathological changes likely occur alongside aging-related changes in body composition, this has not been largely investigated. We aimed to determine the association between adiposity and a specific pattern of reduced cortical thickness associated with AD risk and progression. Global and regional adiposity (via dual-energy x-ray absorptiometry) and AD-signature cortical thickness (via surface-based cortical analysis of 3T brain MRI scans) were measured in 35 middle-aged and older adults from the Wake Forest Alzheimer's Disease Clinical Core (mean age: 69.4±7.8 years, 80% female, 91% White, 29% cognitively impaired). Partial correlations adjusted for age, sex, and cognitive status were examined overall and stratified by age (0.59, $p \leq 0.05$). No significant associations were observed in middle-aged adults. These findings suggest that AD-related cortical thinning may be accompanied by a global reduction in body fat among older adults.

AGE-RELATED CHANGES IN MOLECULAR AND WHOLE MUSCLE FUNCTION: ROLE OF FAT CONTENT?

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Decreases in muscle size and function are a general consequence of old age; the precise mechanisms of these changes remain unclear. Recent studies suggest that fat deposition in muscle may also contribute to dysfunction in older adults. Fat content was quantified in the quadriceps, and its effects on function in healthy young (21-45 y) and older (65-75 y) men and women (n=44) of comparable physical activity were compared. A subset of the young matched with the older group for muscle fat content were also examined. Peak fat-free whole muscle cross-sectional area (mCSA; cm2), volume (MV; cm3), fat content (fat fraction, FF; %), specific torque (Nm/mCSA) and peak contraction velocity (Nm·s-1) were determined using fat-water magnetic resonance imaging and dynamometry (0-300□·s-1). To examine potential molecular mechanisms of muscle weakness, vastus lateralis biopsies were obtained (n=31) and cross-bridge kinetics of type I and II fibers were determined. FF was higher in older adults than young (8.4±1.2% (SE), 7.6±1.4; p=0.03), while mCSA (48.9±10.4 vs. 64.2±17.3), MV (1536±532 vs. 2112±708), specific torque (2.6±0.4 vs. 3.2±0.4), and peak voluntary contraction velocity (422±20 vs. 441±23) were lower in older than young ($p<0.01$). Type II fiber myosin attachment rate was slower and attachment time longer in older muscle ($p<0.017$), providing a potential mechanism for the slowing of peak contraction velocity with age. Notably, differences at the whole muscle and molecular levels remained for the subset of young and older groups matched for FF, suggesting that fat deposition in muscle does not exacerbate age-related changes in function.

ASSOCIATIONS BETWEEN A NEW BIOMARKER OF ELEVATED CHRONIC INFLAMMATION AND ACCELERATED AGING

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To further understand and measure the association between chronic inflammation, aging, and age-related diseases,