

Comprehensive Index of Frailty: a multi-dimensional construct from the Hong Kong Centenarian Study

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Introduction: Frailty is a global epidemiological and clinical phenomenon that can lead to poor long-term outcome. A better understanding of its components is essential for future developments of management strategies. We sought to assess the incremental validity of a new Comprehensive Index of Frailty over Frailty Index in predicting self-rated health and functional dependency among the oldest-old adults.

Methods: We conducted a cross-sectional community-based centenarian study. A quota sampling method was used to recruit a geographically representative sample of 124 community-dwelling Chinese near- and centenarians. Two validated instruments (Chinese Longitudinal Healthy Longevity Survey and Elderly Health Centre questionnaire) were administered through face-to-face interviews. Frailty was first assessed using a 32-item Frailty Index (FI-32). Then a new Comprehensive Index of Frailty (CIF) was constructed by adding 12 more items in the psychological, social/family, environmental, and economic domains to the FI-32. Hierarchical multiple regression was used to explore whether the new CIF provided significant additional predictive power for self-rated health and instrumental activities of daily living (IADL) dependency.

Results: The mean age was 97.7 (standard deviation, 2.3; range, 95-108) years, and 74.2% were female. Using the Frailty Index for reference, 16% of our participants were non-frail, 59% were pre-frail, and 25% were frail. Frailty according to FI-32 significantly predicted self-rated health and IADL dependency beyond the effect of age and gender. Inclusion of the new CIF into the regression models provided significant additional predictive power beyond FI-32 on self-rated health, but not IADL dependency.

Conclusions: Psychological, social/family, environmental, and economic factors are essential elements of a frailty assessment tool. Our result supports the concept that a comprehensive model of frailty should be a multi-dimensional and multi-disciplinary construct. Future studies should validate this construct in different settings and age-groups, using our new CIF.

Adipose-specific inactivation of c-Jun NH2-terminal kinase alleviates atherosclerosis in ApoE-deficient mice

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Introduction: Inflammation in adipose tissues is observed in obesity, a major risk factor for atherosclerosis. This study aimed to investigate whether adipose-specific inactivation of c-Jun NH₂-terminal kinase (JNK) can protect against atherosclerosis.

Methods: Transgenic mice expressing an adipose-specific dominant negative form of JNK (dnJNK) were crossbred with ApoE^{-/-} mice to generate ApoE^{-/-}/dnJNK (ADJ) mice. ApoE^{-/-} and ADJ mice were fed a high-fat-high-cholesterol diet for 10 weeks and examined for atherosclerosis, adipose tissue inflammation, and metabolic phenotypes. For transplantation study, epididymal white adipose tissues (eWAT) from dnJNK or wild-type C57 donors were transplanted into ApoE^{-/-} recipients, which were subjected to atherosclerosis assessment.

Results: ADJ mice developed significantly less atherosclerotic plaques in the aorta and aortic root, as shown by Oil Red O staining. Macrophage infiltration and the expression of pro-inflammatory cytokines in adipose tissues were markedly reduced in eWAT in ADJ mice. ApoE^{-/-} mice receiving eWAT transplantation from ADJ donor mice, but not wild-type donor mice, were protected from atherosclerosis, as shown by Oil Red O staining.

Conclusion: JNK inactivation in adipose tissues can alleviate atherosclerosis, suggesting a therapeutic potential in atherosclerosis management.

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