

A brief note on frailty syndrome in pulmonary and critical care.

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Introduction

Frailty is a syndrome characterized by a vulnerability to stressors resulting from an accumulation of deficits. The biological pathways driving frailty include chronic systemic inflammation and neuroendocrine dysregulation. In adults with chronic lung disease, frailty is associated with more frequent exacerbations of lung disease. Geriatricians noticed subsets of older persons as early as the 1940s, whose functional limits and age-related comorbid disorders looked to be larger than chronologic age alone could predict. However, it wasn't until the early twenty-first century that researchers like Linda Fried and Kenneth Rockwood identified these phenomena as a unique syndrome they called "frailty." Frailty is now defined as an accumulation of physiologic impairments across several interconnected systems that results in both contemporaneous functional restrictions and sensitivity to additional stresses, according to the most often accepted definition. Frailty is a "state of risk" in which a relatively minor stressor that would have been insignificant otherwise overwhelms the body's now-depleted physiologic reserves, resulting in a disproportionate (and potentially catastrophic) decrease in health. Frailty is connected with the most critical outcomes for older persons in the field of geriatrics: the loss of physical and cognitive functioning required sustaining an independent living. Frailty is linked to a wide range of physical and cognitive deficits, as well as an increased chance of falls, hospitalisation, institutionalisation, a lower health-related quality of life, and mortality. In pulmonary medicine, fragile individuals with lung illness may be more likely to develop pulmonary exacerbations and, if exacerbations do occur, to experience higher loss of function and death. In critical care medicine, weak patients who acquire acute critical illness are more likely to die early or require extended or permanent institutionalisation if they survive until discharge [1-3].

Frailty has recently been identified as a risk factor for poor outcomes in adults with lung disease and critical illness, including children. Muscle wasting, weakness, and malnutrition are common in those with lung disease. Treating these frailty constructs may partially explain why pulmonary rehabilitation improves exercise capacity, disability, and quality of life. For lung transplant candidates, such interventions might reduce wait-list delisting or death. Prior efforts to treat frailty deficits of undernutrition and endocrine dysfunction during critical illness have been ineffective [4]. Further development and testing of novel rehabilitative

therapies for critically ill patients is urgently needed. Use of growth hormone replacement in acutely critically ill medical and surgical patients doubled risk of in-hospital death. It is likely that refinements to existing instruments may be needed for frailty assessment in lung disease and critical illness. Some single frailty constructs may explain the majority of the observed association between frailty and poor outcomes. Adding imaging or biomarker assessments may improve the instrument risk prediction. Frailty assessment may explain functional limitations and disability that appear to be out of proportion to pulmonary impairment. Preoperative frailty and sarcopenia are associated with postoperative complications and mortality after major surgery. Measuring frailty in adults with lung disease preparing to undergo surgery could further improve risk stratification [5,6].

Frailty is a generalised vulnerability to stressors that results from an accumulation of physiologic impairments across numerous interconnected systems. It was originally a geriatric concept. Frailty is widespread in people with lung disease and critical illness, and it's linked to poor functional status, lung disease exacerbations, disability, poor health-related quality of life, and mortality. Frailty assessment may aid doctors in identifying patients who are at a higher risk of poor outcomes and those who may benefit from tailored therapy. Clinical frailty assessments must be refined, processes must be understood, and therapies targeting frailty in lung disease and critical illness must be developed to preserve functional independence, reduce disability, and enhance survival.

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