Gut-Muscle Axis: Implications for Malnutrition in Hospitalized Older Adults

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Description

Malnutrition presents a multifaceted challenge in healthcare, particularly among hospitalized patients, with older adults being particularly vulnerable. The underlying causes of malnutrition are diverse, ranging from inadequate dietary intake to underlying diseases and the aging process itself. This syndrome manifests through altered body composition and diminished biological function, resulting in physical decline and impaired recovery. Importantly, malnutrition not only compromises the body's ability to tolerate and respond to medical interventions but also predisposes individuals to a myriad of complications and a poorer prognosis. Recent research has illuminated the intricate relationship between the gut microbiome and skeletal muscle, elucidating what is now termed the "gut-muscle axis." This axis plays a pivotal role in numerous physiological processes, including digestion, metabolism, inflammation, and immunity. Emerging evidence suggests that disturbances in this axis may contribute to the development, progression, and consequences of malnutrition. Moreover, findings from studies on related muscle wasting disorders such as cachexia, sarcopenia, and frailty provide further support for this hypothesis. Age-related changes, coupled with various environmental and lifestyle factors, can disrupt the delicate balance of the gut microbiota.

Pathogenic bacteria

Older adults, especially those residing in nursing homes, often exhibit altered microbiota composition compared to their community-dwelling counterparts. These alterations include an increased abundance of pathogenic bacteria and a reduction in beneficial commensals, leading to dysbiosis. Commensal bacteria play a vital role in gut health by producing Short-Chain Fatty Acids (SCFA), which exert numerous beneficial effects, including modulation of immune responses and maintenance of gut barrier integrity. Reduced SCFA levels can compromise gut barrier function, leading to increased intestinal permeability and systemic inflammation, ultimately contributing to metabolic dysfunctions and muscle wasting. These physiological changes further exacerbate malnutrition and contribute to the development of chronic diseases and other geriatric syndromes, thus increasing the demand for healthcare services, particularly hospitalization. The intricate interplay between nutritional status, gut microbiota, and health outcomes underscores the importance of addressing malnutrition comprehensively, especially in acutely ill hospitalized older adults. Despite the growing recognition of the gut-muscle axis and its implications for malnutrition, research in acute hospital settings remains limited. Therefore, our study seeks to fill this gap by investigating the association between disease-related malnutrition and the composition and metabolic potential of the gut microbiota in acutely ill hospitalized older adults. By elucidating this relationship, we aim to shed light on novel therapeutic targets and interventions that may improve clinical outcomes and enhance the quality of care for this vulnerable population.

Malnutrition

Understanding the complex interplay between malnutrition, gut microbiota, and skeletal muscle in acutely ill hospitalized older adults is paramount for improving clinical care and outcomes in this vulnerable population. By elucidating the mechanisms underlying malnutrition and its impact on gut microbiota composition and function, we can identify novel therapeutic targets and interventions to mitigate its adverse effects. Furthermore, our research may inform the development of personalized nutrition strategies tailored to the individual needs of hospitalized older adults, ultimately improving their nutritional status, enhancing recovery, and reducing the risk of complications during hospitalization and beyond. Moreover, our findings may also have broader implications for preventive strategies aimed at reducing the risk of malnutrition and its associated complications among older adults in both hospital and community settings. By addressing modifiable risk factors such as diet, physical activity, and medication use, healthcare providers can potentially mitigate the development and progression of malnutrition. Ultimately, a comprehensive approach that considers the intricate interactions between nutritional status, gut microbiota, and skeletal muscle health is essential for optimizing outcomes and promoting overall well-being in older adults.