

Sarcopenia in Elderly Patients with Type 2 Diabetes Mellitus as Risk Factor

Carmine Finelli^{1*} and Simone Dal Sasso²

¹Department of Internal Medicine, Italy

²Independent Researcher, Italy

***Corresponding author:** Carmine Finelli, Department of Internal Medicine, Hospital "A. Maresca" - ASL Napoli 3 SUD, Via Montedoro, 1, 80059 Torre del Greco (Naples), Italy.

ARTICLE INFO

Received: 📅 May 07, 2024

Published: 📅 May 15, 2024

Citation: Carmine Finelli and Simone Dal Sasso. Sarcopenia in Elderly Patients with Type 2 Diabetes Mellitus as Risk Factor. Biomed J Sci & Tech Res 56(4)-2024. BJSTR. MS.ID.008879.

Editorial

Over the past ten years, the number of elderly patients with type 2 diabetes mellitus (T2DM) has increased dramatically due to the world's fast aging population. The two primary pathways in the pathophysiology of type 2 diabetes are insulin resistance in target tissues and insulin insufficiency, which is brought on by islet β cell failure [1]. Apart from the triad of muscle, liver, and β cell, other factors that contribute to the development of glucose intolerance in type 2 diabetics include fat cell (accelerated lipolysis), gastrointestinal tract (incretin deficiency/resistance), α -cell (hyperglucagonemia), kidney (increased glucose reabsorption), and brain (insulin resistance) [2]. In addition, a significant prevalence of malnutrition is linked to diabetes in elderly patients [3]. In elderly patients with diabetes, malnutrition may have a detrimental effect on the pathophysiology of the condition as well as the morbidity and death rate [4]. Due to the consequences of glucotoxicity, increased inflammation and oxidative stress, and diabetic neuropathy, elderly people with T2DM are more likely to experience decreased skeletal muscle mass, muscle weakness, and poor physical function [5,6]. As a result, maintaining muscle mass or function is crucial for senior diabetes mellitus patients [7]. Higher prevalence rates of comorbidities, such as malignant tumors, chronic kidney disease, and chronic heart failure, are also present in elderly individuals with diabetes mellitus [8]. These conditions might affect appetite, cause weight loss, and cause a reduction in food consumption.

Sarcopenia, or malnutrition, is a significant geriatric condition linked to diabetes mellitus in the elderly [9]. Muscle weakness or diminished physical function linked to aging-related muscle mass loss, chronic inflammation, elevated oxidative stress, reduced physical activity, and malnutrition are the hallmarks of sarcopenia [10]. On the other hand, malnutrition is a state marked by deficiencies in calories and protein associated with appetite reduction brought on by age, metabolic disorders, or malabsorption [11]. Additionally, recent development of diagnostic criteria for cachexia has drawn attention to the significance of the illness, wherein inflammation resulting from malignant tumors and chronic diseases is identified as an underlying pathological condition [12]. A reduction in everyday activities, fractures of the bones, admission to the hospital, long-term hospitalization, greater healthcare costs, and a rise in death rates are all associated with sarcopenia, malnutrition, and cachexia [13]. Therefore, it is crucial to diagnose and treat these disorders in elderly patients with diabetes mellitus as soon as possible. Patients with T2DM are more sarcopenic than the other hospitalized patients, yet they are malnourished to a similar extent [14,15].

A worse prognosis is determined by comorbidities, inflammation, and sarcopenia [15]. Patients may have a better prognosis if malnutrition and sarcopenia are actively and promptly identified, followed by appropriate treatment [15]. Bioelectrical impedance analysis (BIA) is a method used to detect changes in body composition. The data indi-

cates that BIA may not be the best method for differentiating between older people with and without diabetes mellitus because of its susceptibility to several variables, such as variations in glucometabolic and cardiovascular regulation [16]. Recently, it showed that elderly people diagnosed with T2DM who also have sarcopenia or malnutrition are more likely to require longer hospital stays and to die within a year of being released from the hospital [17]. Another, it is unknown how vitamin D deficiency (VDD) affects both major and tiny nerve fiber damages in older T2DM patients [18]. In fact, there is a direct correlation between VDD and an increased risk of diabetic peripheral neuropathy (DPN). VDD may influence big nerve fibers, which may facilitate the production of DPN [18].

Sarcopenia is becoming more common in elderly with T2DM patients, which is concerning for public health because it significantly lowers quality of life. A sufficient attention should be given also to sarcopenia as risk factors in elderly with T2DM. A multidisciplinary approach including medication, diet, exercise, and the right daily routine is necessary for effective diagnosis and management. Therefore, further study is required to comprehend the underlying mechanisms and enhance diagnostic and treatment approaches in elderly with T2DM.

Disclosure Statement

The authors declare that there are no conflicts of interest.

References

- Galicia-Garcia U, Benito-Vicente A, Jebari S, Cesar Martin, Haziq Siddiqi, et al. (2020) Pathophysiology of Type 2 Diabetes Mellitus. *Int J Mol Sci* 21(17): 6275.
- DeFronzo RA (2009) Banting Lecture. From the triumvirate to the ominous octet: a new paradigm for the treatment of type 2 diabetes mellitus 58(4): 773-795.
- Vargas Becerra C, Urquiaga Meza D, Valderrama Bacilio T, Fiorelle Urbina Calderon, et al. (2022) Complementary considerations in the evaluation of malnutrition in hospitalized elderly patients with type 2 diabetes mellitus. *Endocrinol Diabetes Nutr (Engl Ed)* 69(6): 453-454.
- Tamura Y, Omura T, Toyoshima K, Atsushi Araki (2020) Nutrition Management in Older Adults with Diabetes: A Review on the Importance of Shifting Prevention Strategies from Metabolic Syndrome to Frailty. *Nutrients* 12(11): 3367.
- Dlamini M, Khathi A (2023) Prediabetes-Associated Changes in Skeletal Muscle Function and Their Possible Links with Diabetes: A Literature Review. *Int J Mol Sci* 25(1): 469.
- Lopez-Pedrosa JM, Camprubi-Robles M, Guzman-Rolo G, Ricardo Rueda, Alejandro Sanz-Paris, et al. (2024) The Vicious Cycle of Type 2 Diabetes Mellitus and Skeletal Muscle Atrophy: Clinical, Biochemical, and Nutritional Bases. *Nutrients* 16(1): 172.
- Chen H, Huang X, Dong M, Wen S, Zhou L, et al. (2023) The Association Between Sarcopenia and Diabetes: From Pathophysiology Mechanism to Therapeutic Strategy. *Diabetes Metab Syndr Obes* 16: 1541-1554.
- Ravender R, Roumelioti ME, Schmidt DW, Mark L Unruh, Christos Argypoulos, et al. (2024) Chronic Kidney Disease in the Older Adult Patient with Diabetes. *J Clin Med* 13(2): 348.
- Matsuura S, Shibazaki K, Uchida R, Yukiko Imai, Takuya Mukyama, et al. (2022) Sarcopenia is associated with the Geriatric Nutritional Risk Index in elderly patients with poorly controlled type 2 diabetes mellitus. *J Diabetes Investig* 13(8): 1366-1373.
- Larsson L, Degens H, Li M, Young IL Lee, Wesley Thompson, et al. (2019) Sarcopenia: Aging-Related Loss of Muscle Mass and Function. *Physiol Rev* 99(1): 427-511.
- Bunker S, Pandey J (2021) Educational Case: Understanding Kwashiorkor and Marasmus: Disease Mechanisms and Pathologic Consequences. *Acad Pathol* 8: 23742895211037027.
- Mariean CR, Tiucă OM, Mariean, Ovidiu Simion Cotoi (2023) Cancer Cachexia: New Insights and Future Directions. *Cancers (Basel)* 15(23): 5590
- Park WT, Shon OJ, Kim GB (2023) Multidisciplinary approach to sarcopenia: a narrative review. *J Yeungnam Med Sci* 40(4): 352-363.
- Salom Vendrell C, García Tercero E, Moro Hernández JB (2023) Sarcopenia as a Little-Recognized Comorbidity of Type II Diabetes Mellitus: A Review of the Diagnosis and Treatment. *Nutrients* 15(19): 4149.
- Galeano-Fernández TF, Carretero-Gómez J, Vidal-Ríos AS, G M Garcia-Garcia, S Cordoba-Bueno, et al. (2023) Impact of diabetes, malnutrition and sarcopenia on the prognosis of patients admitted to internal medicine. *Rev Clin Esp (Barc)* 223(9): 523-531.
- Salis F, Zanda F, Cherchi F, Efsio Cossu, Antonella Mandas, et al. (2023) Diabetes mellitus, malnutrition, and sarcopenia: The bond is not explained by bioelectrical impedance analysis in older adults. *J Med Life* 16(8): 1170-1177.
- Beretta MV, de Paula TP, da Costa Rodrigues T, Thais Steemburgo, et al. (2024) Prolonged hospitalization and 1-year mortality are associated with sarcopenia and malnutrition in older patients with type 2 diabetes: A prospective cohort study. *Diabetes Res Clin Pract* 207: 111063.
- Fei S, Fan J, Cao J, Qi Pan, Huan Chen, et al. (2024) Vitamin D deficiency increases the risk of diabetic peripheral neuropathy in elderly type 2 diabetes mellitus patients by predominantly increasing large-fiber lesions. *Diabetes Res Clin Pract* 209: 111585.

ISSN: 2574-1241

DOI: 10.26717/BJSTR.2024.56.008879

Carmine Finelli. Biomed J Sci & Tech Res



This work is licensed under Creative Commons Attribution 4.0 License

Submission Link: <https://biomedres.us/submit-manuscript.php>



Assets of Publishing with us

- Global archiving of articles
- Immediate, unrestricted online access
- Rigorous Peer Review Process
- Authors Retain Copyrights
- Unique DOI for all articles

<https://biomedres.us/>