

RELATIONSHIP BETWEEN TYPE 2 DIABETES MELLITUS, POSTURAL BALANCE, AND THE RISK OF FALLS IN THEE ELDERLY

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SUMMARY

The elderly person with diabetes mellitus experiences a reduction in muscle mass, which increases the risk of falls, thereby heightening the fear of falling. The objective of this work is to conduct an integrative literature review that can analyze the relationship between Type 2 Diabetes Mellitus, postural balance, and the risk of falls in the elderly. The databases PubMed, Scopus, LILACS, and SciELO were consulted, using the terms "Type 2 Diabetes Mellitus," "postural balance," "falls," "elderly," and "balance and elderly"; "balance and elderly and falls"; "balance and elderly and falls and diabetes mellitus." The inclusion criteria defined for the selection of articles were articles published in Portuguese and English, full-text articles that addressed the theme related to the integrative review, and articles published and indexed in the aforementioned databases. Elderly people with type 2 diabetes have a greater fear and risk of falls, and postural balance problems, especially those who use insulin or other medications.

Keywords: Elderly, diabetes mellitus, postural balance, falls.

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Introduction

According to Alshammari et al. (2014), they report that with the aging process, postural balance deteriorates due to multiple declines and a high incidence of diseases common to this process, which is a factor in the increased risk of balance impairment and gait disorders. Sensory deficits in the lower extremities, peripheral neuropathy, visual impairment, and vestibular dysfunction significantly influence inadequate postural control in the elderly. In individuals with diabetes, the consequences are worse. (REIS; REIS; TORRES, 2015, YANASE et al, 2018; MALTA et al., 2019, RINKEL et al., 2019).

The elderly person with diabetes mellitus (DM) experiences a reduction in muscle mass, which increases the risk of falls, thereby increasing the fear of falling. Elderly individuals with diabetic polyneuropathy (DPN) exhibit worse patterns in static balance under closed-eye conditions compared to patients who have DM but do not have DPN. Intimately related to posture and gait, falls are often consequences of the acquisition of morbidities. (PALMA et al., 2013, PINHEIRO, VILAÇA, CARVALHO 2015; CANUTO et al, 2020)

Given this issue, does Type 2 Diabetes Mellitus more significantly affect postural balance and increase the risk of falls in the elderly? Therefore, the objective of this work is to conduct an integrative literature review that can analyze the relationship between Type 2 Diabetes Mellitus, postural balance, and the risk of falls in the elderly.

Methodology

For the completion of this integrative review, the following steps were followed: formulation of the research question, selection of databases, definition of inclusion and exclusion criteria, the databases PubMed, LILACS, and SciELO were consulted, using the terms "Type 2 Diabetes Mellitus," "postural balance," "falls," "elderly," and "balance and elderly"; "balance and elderly and falls"; "balance and elderly and falls and diabetes mellitus." The inclusion criteria defined for the selection of articles were:

articles published in Portuguese and English between 2014 and 2020, full-text articles that addressed the theme related to the integrative review, and articles published and indexed in the aforementioned databases. The research took place from September 2023 to February 2024. Studies that did not directly address this thematic relationship were excluded.

Results

Selection of studies

Two authors (JFFF and DYSO) were responsible for reading the titles and abstracts of all the articles, subsequently analyzing any discrepancies in the selection of the articles. All types of studies were included, except case reports that identified an association between diabetes mellitus, postural balance, and fall risk in the elderly. Only studies conducted on populations aged 60 years or older, in a community context, were selected. Subsequently, the articles were read in full by the two authors who conducted the selection in the first stage. An eligibility form was developed for the final selection of the articles. The two authors (JFFF and DYSO) read the articles and any discrepancies in the selection were analyzed, with the decision to include or exclude these articles from the study being made with the assistance of the other authors (BAPFO, JMPS, DAAPO). For data extraction, a table was created containing: study database, study identification information, study design, average age of participants, definition and risk factors for diabetes, and falls, postural balance, and fall identification.

Below, we describe the keywords and the number of records in the respective databases used and consulted by the authors.

PUBMED: "balance and elderly" = 1300; "balance and elderly and falls" = 826; "balance and elderly and falls and diabetes mellitus" = 19. **LILACS:** "balance and

elderly = 545; "balance and elderly and falls" = 250; "balance and elderly and falls and diabetes mellitus" = 100 Texto a traducir: . **SCIELO:** "balance and elderly = 132; "balance and elderly and falls" =2; "balance and elderly and falls and diabetes mellitus"= 132. **TOTAL:** 3,206 articles

Screening and inclusion in the study

- Studies identified through database search = 3,306; Pubmed = 2,145; Lilacs = 895;
- After removing duplicate studies and summary = 1506
- Selected studies = 1800
 - Excluded articles = 1715
 - Not mentioned falls = 850; did not present a relationship between postural balance, falls, and diabetes = 375; Did not include population aged 60 and over = 331; Publication over 10 years = 91; Editorials, case report, letter to the editor = 68
 - Articles evaluated for eligibility = 85
- Full-text articles excluded, with reasons = 77
- Articles selected for descriptive analysis n = 8

Discussion

The findings of this review indicate that type 2 diabetes mellitus (T2DM) is strongly associated with postural instability and an increased risk of falls in the elderly, due to multiple factors that affect postural balance. Peripheral neuropathy, sarcopenia, and frailty emerge as the main underlying mechanisms of this association. Neuropathy

leads to a decrease in proprioception and impairment of postural reflexes, while sarcopenia reduces the muscle strength necessary for maintaining balance. Moreover, inadequate glycemic control can worsen these conditions, further increasing the risk of falls. Interventions should, therefore, focus not only on glycemic control but also on physical rehabilitation programs aimed at improving balance and muscle strength. (NUGRAHA, 2024; CHAPMAN et al., 2017, RASHEDI et al., 2019, SARODNIK, 2018)

Conclusion

Elderly people with type 2 diabetes have a greater fear and risk of falls, and postural balance problems, especially those who use insulin or other medications. This is related to the complications of the disease they suffer from, such as diabetic neuropathy, decreased sensory and motor skills, and diminished cognitive function.

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