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Assessment of the risk of falls in older adults with Alzheimer

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ABSTRACT

The present article aims to evaluate the risk of falls in elderly people with Alzheimer's through the times up and go (tug), anterior functional range (TAF), and berg balance scale (eeb) tests. Introduction: morphological, functional, biochemical and psychological changes occur in the aging process. Alzheimer's pathology affects about 27 million people, who are over 65 years of age. It is a neurodegenerative disorder that progressively compromises the performance of your daily activities. Elderly people affected by this pathology have cognitive impairment that doubles their chances of falling, compared to elderly people who have conserved cognition. The methodological approach applied to the development of this work consisted of conducting a bibliographic review of the integrative literature in databases recognized by the scientific community, such as Electronic Library Online (SciELO), Latin American and Caribbean Health Sciences Literature (LILACS) and Google Scholar. The search was restricted to publications in the period from 2019 to 2024, in Portuguese. The evaluation, in turn, is of paramount importance to assess what are the risk factors that lead the elderly to fall. Functional tests are essential at this time of patient evaluation.

Keywords: Alzheimer, Elderly, Fall, Functional tests, Aging.

INTRODUCTION

The World Health Organization (WHO) defines healthy aging as the process of improving the opportunity for health, participation and safety, for the evolution of quality of life as individuals age, as well as the process of developing and maintaining functional capacity, which contributes to the well-being of older people, with functional capacity being the result of the interaction of the person's intrinsic capacities. (Galvão, et al, 2021). According to data from the Brazilian Institute of Geography and Statistics (IBGE), the Brazilian population exceeded the 30.2 million mark in 2017. Representing a growth of 18% in this age group, which has become increasingly representative in Brazil. (Borges, et al, 2023). Approximately 15% of Brazilians, 32

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million people, in 2025 will occupy the 6th place in the number of aging growth in Brazil. (Santos, et al, 2021).

The aging process is configured because it is dynamic and progressive, in which morphological, functional, biochemical and psychological changes occur, which determine the progressive loss of the individual's ability to adapt to the environment, causing greater vulnerability and incidence of pathological processes. (Nackachima, et al, 2020). One of the biological transformations is the degeneration of the central nervous system, giving rise to dementias. The most common is Alzheimer's disease (AD), with prevalence increased from 0.7% of 60 to 64 years of age to about 40% in the 90 to 95 age groups. (Dias, et al, 2020).

There are terms that are related to aging, such as senescence, it is the natural aging of the human body, a gradual and progressive process without pathological causes, such as the appearance of white hair; Senility, on the other hand, is pathological aging due to genotypic and phenotypic issues, such as dementia. (Mariano, et al, 2022). Aging is a risk factor for the development of Alzheimer's Dementia (AD), considering that the elderly are the age group most affected by this type of dementia. AD has a late evolution and can affect individuals from different environments, with the most common being the silent appearance of symptoms, with progressive worsening of memory, accompanied by difficulties in retaining new information and loss of the ability to perform activities of daily living (ADLs). It is related to progressive cognitive loss, functional decline, and gradual loss of autonomy. (Marques, et al, 2022.)

Alzheimer's pathology (AD) is the most general form of neurodegenerative disorder, affecting about 27 million individuals and accounting for 60 to 70% of all dementia cases. (Cavalcanti, 2023). The main factor is aging since in this phase there is the greatest loss of muscle mass, especially in the lower limbs, changes in systems such as bone, joint and nervous. (Soares, at al, 2021). However, there are other factors that can influence such as female gender, previous history of falls, use of specific medications, among others. The increase in falls, however, can also be linked to unidentified or improperly treated health problems, as well as risk behaviors or environmental conditions that are inappropriate for the elderly. (Prudêncio, 2023). Falls in the elderly are a problem in society, often resulting in injuries, mortality, and hospitalization. (Rodrigues, et al, 2023). It can result in several sequelae that physically and psychologically affect the elderly, impair mobility, limit postural balance, making them dependent on family members or other individuals to carry out their daily activities. (Araujo, et al, 2023). It is usually correlated with sensorimotor alterations resulting from senility, such as

balance deficits, gait disorders, cognitive deficit, and decreased functional capacity. (Rodrigues, et al, 2021).

It is understood that, in the population, on average 60% of the elderly with cognitive impairment fall at least once a year, twice the number of elderly people

cognitively healthy. (Rodrigues, et al, 2023). The prevention of the risk of falls is of great relevance, so that strategies can be applied in order to reduce the risk of falling. For this, an assessment of the individual and risk factors for a possible intervention is necessary. (Cruvinel, et al, 2020).

The aim of the study was to conduct an integrative literature review to identify the association of fall risk with Alzheimer's dementia through the Times UP and Go (TUG), Anterior Functional Reach (TAF), and Berg Balance Scale (BBS) tests.

METHODOLOGY

The methodology used for the development of this work was a bibliographic review of the literature indexed in databases recognized by the scientific community, such as Electronic Library Online (SciELO), Latin American and Caribbean Health Sciences Literature (LILACS) and Google Scholar. The objective of the search for articles was to include scientific publications that address the purpose of the research, which were full text and available, contemplating at least one of the chosen descriptors, published from 2019 to 2024, in Portuguese, and the search was carried out through the following descriptors: Alzheimer's, Elderly, Fall, Functional tests, Aging, Evaluation. After searching the database, 36 articles were selected. After all the studies were read, 27 were chosen.

The exclusion criteria were articles that did not contemplate the purpose of the research and that did not include the study period.

DISCUSSION

ALZHEIMER

According to the Ministry of Health (WHO), AD is a progressive and lethal neurodegenerative disorder that presents itself through cognitive deterioration and memory loss, which progressively compromises the performance of daily activities by the individual, and can be diagnosed through the neuropsychiatric symptoms presented, however, other symptoms may arise such as mood swings, aggressiveness and behavioral changes perceived by the evaluator (Freire, at al, 2022). It is a clinical syndrome, characterized by progressive decline in two or

more cognitive domains, encompassing memory, language, visual function, personality, and behavior. (Mendes, 2024). AD inserts and amplifies itself progressively and continuously for years. This pathology affects more than 10% of adults over 65 years of age and 40% of adults over 80 years of age. (Freire, at al, 2022).

Its cause remains unknown, however, there are some factors that are considered positive in the development of the pathology, such as genetic, epigenetic, metabolic, inflammatory reactions, mitochondrial pathogenic cascade, oxidative stress, plasma and brain proteins, neurotrophic factor, estrogen deficiencies, and environmental factors. (Freire, at al, 2022). In addition, most elderly people with cognitive impairment suffer twice as many falls compared to older adults with conserved cognition. As a result, motor impairments can result in loss of independence and quality of life. (Marinho, 2020).

RISK FACTORS FOR FALLS IN THE ELDERLY

The occurrence of falls among the elderly may be associated with single causes and individual, easy to identify, or, usually, multiple and difficult to identify. (Neiva, et al, 2022). As a result, intrinsic factors include visual changes, cognitive changes, musculoskeletal changes, vitamin deficit, cognitive deficit, foot deformities, and comorbidities that the elderly may present, such as Alzheimer's pathology (Sofiatti, et al, 2021), decreased muscle strength, balance and gait dysfunctions, and changes in flexibility. (Costa, et al, 2021). Extrinsic factors comprise the characteristics of the environment in which the individual lives, in which they are related to unsafe environments: slippery floors, carpets around the house, stairs without handrails, inadequate lighting, inadequate furniture in a tight space, represent the main risk factors for falls. (Sofiatti, et al, 2021).

IMPORTANCE OF EVALUATION

Due to the prevalence of significant falls in the elderly, the assessment of functional capacity in the elderly who fall and those who do not fall is of paramount importance (Batista, et al, 2021), as the decrease in their speed is correlated with a difficulty in controlling postural balance, and a reduction in muscle strength, (Campos, et al, 2023). The evaluation is also associated with characterizing the intrinsic and extrinsic factors for the implementation of prevention strategies that rehabilitate the muscle strength, balance and functional capacity of the elderly. (Batista, et al, 2021). There are different tools developed for the assessment of balance, with the aim of assessing the risk of falling. (Lima, et al, 2023).

FUNCTIONAL TESTS

Body balance can be established as the ability to maintain the center of body gravity projected over the limits of the support base during static and dynamic positions. The elements of postural control are affected in the elderly and several stages can be annulled, thus compressing the compensatory capacity of the system, leading to an increase in instability, which is a risk factor for falls. In the assessment of functional mobility, there are specific tests that address this, which are the TUG, TAF, EEB. (Nackachima, et al, 2020).

Timed up and go (TUG)

It refers to a functional balance and mobility test that assesses the risk of falling in the patient. (Andrade, et al, 2021). It timed the time it will take the individual to get up from a chair, walk a distance of 3 meters and return to the starting chair at a safe and comfortable pace. (Cavalcanti, 2023). The number of steps that were necessary to complete the test is also analyzed. The elements consist of the time it takes the individual to complete the test. A more agile time indicates better functional development, while a shorter time suggests a higher risk of falls. (Soares, et al, 2023). Performing the test in up to 10 seconds is seen as normal for independent individuals and without risk of falls, between 11 and 20 seconds is expected for frail elderly, with partial independence and with low risk of falls, above 20 seconds points to an important deficit in physical mobility and risk of falls. (Dias, et al, 2020).

Functional Scope Test (TAF)

This test determines how much the elderly person is able to move within the previous stability limit. It is used to identify the risk of falling. (Falcão, 2020). To perform the test, the individual to perform it needs to be in an orthostatic posture, lower limbs abducted, with the absence of shoes, upright spine, look at a specific point ahead, arms in 90° flexion and right hemibody close to the wall. With the beginning of this position, the patient evaluated is asked to recline to his maximum limit forward. The excursion of the arm from the beginning to the end is assessed by a tape measure fixed to the wall in the horizontal direction next to the individual, at the height of the acromion. For checking, the end of the third metacarpal is used as a starting demarcation up to full range. The parameters result in the evaluation of static equilibrium. In order to acquire the complete distance by directing the arms in front of the body, respecting the feet fixed on the ground. (Soares, et al, 2023). The test is performed and displacements of less

than 15 centimeters indicate the individual's fragility and risk of falling; 16 to 25 cm indicates a low risk of falls and above 25 cm shows no risk of falling. (Dias, et al, 2020).

Berg Balance Scale (BSE)

BBS is a test used to determine risk factors for falls and loss of functional independence in activities of daily living. (Mascarenhas, et al, 2022). It is an assessment instrument widely used in studies involving the elderly, which contains 14 items that simulate common activities of daily living. (Moraes, et al, 2023). The berg scale consists of the postures: from sitting to standing; standing without support for 2 minutes; sitting without back support; standing position for sitting position; chair transfers; standing without support and eyes closed; standing without support with feet together; forward reach with outstretched arms; looking back over your shoulders; rotate 360 degrees; position the feet alternately on the step; standing without support with one foot in front; standing on one leg. (Mascarenhas, et al, 2022). Each item has 5 scoring possibilities, ranging from 0 to 4, totaling a maximum of 56 points, with a cutoff point of 45 points for the risk of falls. (Moraes, et al, 2023).

CONCLUSION

Through this literature review, it can be concluded that it is of great importance to assess the risk of falls in elderly people with Alzheimer's disease, as this group covers the age group most affected by this type of dementia and has a progressive cognitive loss, functional decline and gradual loss of autonomy, leading the elderly to lose their own autonomy to perform activities of daily living. In turn, it is essential to evaluate extrinsic factors within the elderly's own home, avoiding falls at home. The tests are fundamental in this evaluation process, as they assess the risk that the patient may have of a possible fall, analyzing their functional loss and mobility. Thus, the applicability of the Timed up and go (TUG), Functional Reach Test (TAF), and the Berg Balance Scale (BBS) are test alternatives for the assessment of functional capacity. With this, it is possible to analyze the possible risk factors, making an individual and appropriate intervention for a good treatment and a good quality of life for the patient.

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