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Original Article

Relationship between the Risk of Falling and Physical Function in Elderly Individuals with Lower Extremity Arthritis

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ABSTRACT

Background: The prevalence of falls among the elderly is a significant public health concern, with lower extremity arthritis being a prominent risk factor. This condition severely impacts daily functioning and increases the risk of falls, leading to further morbidity and decreased quality of life among the aging population.

Objective: This study aimed to investigate the relationship between the risk of falling and physical function in elderly individuals diagnosed with lower extremity arthritis, focusing on the assessment of daily living activities and fear of falling.

Methods: A total of 150 elderly individuals (45 males and 105 females) with lower extremity arthritis were enrolled in this cross-sectional study. Participants' difficulties in performing daily activities and their fear of falling were evaluated using the Falls Efficacy Scale (FES) and the Activities of Daily Living (ADL) scale. Data were collected through structured questionnaires and analyzed using SPSS version 25. Descriptive statistics were employed to calculate frequencies, percentages, means, and standard deviations. The study adhered to the ethical guidelines of the Declaration of Helsinki, with all participants providing written informed consent.

Results: The mean age of participants was 51±7 years, ranging from 40 to 65 years. A significant majority reported difficulty in performing daily activities (70%, n=105) and a fear of falling (80%, n=120). Gender distribution showed a higher prevalence of arthritis and associated issues among females (70%) compared to males (30%).

Conclusion: The study highlights the profound impact of lower extremity arthritis on the physical function and fall risk among the elderly. There is a critical need for integrated healthcare interventions focusing on enhancing physical function and addressing the psychological aspects of fall fear to improve elderly individuals' quality of life with arthritis.

Keywords: Lower Extremity Arthritis, Elderly, Risk of Falling, Physical Function, Activities of Daily Living, Fear of Falling.

INTRODUCTION

In the realm of geriatric medicine, the intersection between the risk of falls and the functional capacity of elderly individuals, particularly those afflicted with lower extremity arthritis, emerges as a critical area of inquiry. Statistically, around one-third of adults aged 65 and above succumb to at least one fall annually, with about 15% experiencing recurrent falls (1, 2). This demographic is further burdened by conditions such as rheumatoid arthritis (RA) and knee osteoarthritis (KOA), which significantly impair their ability to perform activities of daily living (ADL) and maintain independence (1, 3, 4). Rheumatoid arthritis, a complex autoimmune disease, detrimentally affects physical functions and is notably prevalent in Western Europe, thereby exerting substantial pressure on healthcare systems. Similarly, knee extensor weakness is identified as a standalone risk factor for knee osteoarthritis, a condition that compromises mobility, flexibility, muscular strength, and balance (3-5).

The prevalence of persistent pain among older adults living in community settings ranges widely from 25% to 76%, indicative of the varied impact of physical ailments on this population (6, 7). Specifically, individuals with RA exhibit compromised mobility, characterized by a reduction in walking speed, elongated periods of double-foot support, shortened step lengths, and disrupted

walking rhythm. This decline in motor function not only precedes but also accelerates the process of disability, undermining the capacity of elderly individuals to conduct daily activities autonomously (2, 4). The World Health Organization highlights that falls are a prevalent and significant concern, affecting 28-35% of adults over the age of 65 worldwide annually. These incidents, influenced by physiological degeneration associated with aging, have profound implications for the well-being and independence of older adults, leading to injuries and, in severe cases, fatalities (8, 9).

The diagnosis and ongoing assessment of knee osteoarthritis hinge on clinical symptoms and specific radiographic findings, underscoring the condition's complex nature and its impact on physical functionality (10, 11). The economic and functional burdens of falls on older individuals are notable, with those experiencing multiple falls within a year facing heightened risks of mobility and daily activity impairments (12, 13). Comparative analyses reveal that individuals without osteoarthritis score higher on self-reported functional assessments than those with advanced knee osteoarthritis, who show diminished functionality in certain areas (14, 15). Given the high prevalence of lower limb arthritis among the elderly and its direct correlation with discomfort, reduced functionality, and disability, a thorough understanding of its impact on physical function and fall risk is indispensable (5, 6). This knowledge is pivotal in devising targeted interventions aimed at mitigating these risks and enhancing the quality of life for this vulnerable population segment (10, 16).

MATERIAL AND METHODS

In the exploration of the intricate relationship between fall risk and physical function among elderly individuals suffering from lower extremity arthritis, our study population encompassed both male and female participants diagnosed with this condition. To investigate this relationship, we employed two pivotal assessment tools: the Falls Efficacy Scale (FES) and the Activities of Daily Living (ADL) scale (17, 18). These instruments are well-established in geriatric research for evaluating fear of falling and the capability to perform everyday tasks, respectively, providing a comprehensive understanding of the participants' functional status (19, 20).

Data collection was meticulously conducted through structured questionnaires, designed to capture a wide array of information pertinent to the study objectives. These questionnaires were administered to participants who met the inclusion criteria, namely individuals aged 65 years and older diagnosed with lower extremity arthritis. Prior to the commencement of the study, all participants were informed about the study's purpose and procedures, and written informed consent was obtained in adherence to the ethical guidelines outlined in the Declaration of Helsinki. This ensured that the study upheld the highest standards of ethical consideration, respecting the dignity, rights, and welfare of all participants.

The analytical phase of our research was executed using the Statistical Package for the Social Sciences (SPSS), version 25, a sophisticated tool that facilitated a rigorous examination of the collected data. The analysis began with the qualitative data, which was systematically processed to calculate frequencies and proportions. This data was then elegantly visualized through bar charts and pie charts, providing an intuitive understanding of the distribution and prevalence of various factors within our study population. Subsequently, the quantitative data analysis encompassed the calculation of means and standard deviations to assess the central tendency and dispersion of the data. Histograms were utilized to graphically represent these findings, offering a clear visualization of the distribution patterns of key variables.

By integrating these methodological approaches, our study aimed to furnish a robust and nuanced understanding of how lower extremity arthritis impacts fall risk and physical functionality in the elderly. The comprehensive data analysis, rooted in a solid ethical foundation and employing advanced statistical tools, underscores the meticulousness with which this research was conducted, aiming to contribute valuable insights to the field of geriatric medicine.

RESULTS

In the conducted study, a comprehensive analysis of the demographic distribution and pertinent health-related factors among elderly individuals with lower extremity arthritis was carried out. The gender distribution among the participants was markedly skewed towards female individuals, who constituted 70% (105 out of 150) of the study population, while male participants accounted for 30% (45 out of 150), as detailed in Table 1. This gender disparity highlights the potential for gender-specific approaches in managing arthritis and its associated risks in the elderly.

Furthermore, the prevalence of difficulty in performing daily activities was significantly high among the participants, with 70% (105 out of 150) reporting challenges in carrying out these activities, as shown in Table 2. This underscores the profound impact of lower extremity arthritis on the functional capabilities of the elderly, potentially exacerbating the risk of falls and the consequent need for targeted interventions to ameliorate their daily living conditions.

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Compounding the challenges faced by this population is the prevalent fear of falling, reported by a substantial 80% (120 out of 150) of the study participants, as indicated in Table 3. This overwhelming concern not only reflects the physical limitations imposed by arthritis but also suggests a significant psychological burden that may further impair their quality of life and independence.

Table 1: Descriptive Statistics of Gender

Gender	Frequency	Percent (%)
Male	45	30.0
Female	105	70.0
Total	150	100.0

Table 2: Descriptive Statistics of Difficulty Performing Daily Activities

Difficulty Performing Daily Activities	Frequency	Percent (%)
Yes	105	70.0
No	45	30.0
Total	150	100.0

Table 3: Descriptive Statistics of Fear of Falling

Fear of Falling	Frequency	Percent (%)
Yes	120	80.0
No	30	20.0
Total	150	100.0

The cross-referenced data from Tables 1, 2, and 3 collectively paint a comprehensive picture of the intricate interplay between gender distribution, the difficulty in performing daily activities, and the fear of falling among elderly individuals with lower extremity arthritis. The findings underscore the necessity for a multifaceted approach in addressing the needs of this population, integrating medical, physical, and psychological strategies to enhance their overall well-being and reduce the incidence of falls.

DISCUSSION

In our study, which encompassed a total of 150 participants, a notable gender disparity was observed with females constituting 70% (105 individuals) of the sample, while males represented 30% (45 individuals). The participants' ages ranged broadly from 40 to 65 years, with an average age of 51±7 years. A significant majority, 70% (105 individuals), reported experiencing considerable difficulty in performing daily activities, highlighting the debilitating impact of lower extremity arthritis on their functional capacity. Moreover, an overwhelming 80% (120 individuals) of the study cohort expressed a fear of falling, a concern that significantly outweighs the 20% (30 individuals) who did not share this fear (16, 21). These findings align with existing literature that underscores the intricate relationship between arthritis in the lower extremities and an increased risk of falls among the elderly. Notably, a publication in the Journal of Ageing and Health emphasized that individuals with arthritis are 2.5 times more likely to experience falls compared to their counterparts without arthritis. Furthermore, knee and hip osteoarthritis have been identified as critical factors predisposing individuals to falls, with symptomatic osteoarthritis in these joints significantly correlating with an increased likelihood of falling (10, 11, 22).

The insights gleaned from our research resonate with prior studies, which have elucidated the connection between discomfort, muscle weakness, and reduced mobility due to hip or knee osteoarthritis and the consequent elevated fall risk. These impairments not only compromise the physical well-being of the affected individuals but also pose substantial psychological challenges, exacerbating the fear of falling and potentially leading to a cycle of decreased mobility and increased fall risk (6, 17).

This study's strengths lie in its comprehensive evaluation of the interplay between physical function, the fear of falling, and the presence of lower extremity arthritis in an elderly cohort. However, it is not without limitations. The sample's gender imbalance and the reliance on self-reported measures, which may introduce bias or inaccuracies in the reported difficulty in performing daily activities and fear of falling, could affect the generalizability of the findings. Additionally, the cross-sectional design precludes establishing causality between arthritis severity and fall risk (18, 21).

Given these considerations, our study underscores the need for targeted interventions aimed at mitigating fall risk and improving the quality of life for elderly individuals with lower extremity arthritis. Future research should focus on longitudinal designs to explore the causal pathways linking arthritis to fall risk and incorporate objective measures of physical function. It is also imperative to

develop and evaluate comprehensive management strategies that address both the physical and psychological aspects of fall risk in this population, including strength training, balance exercises, and cognitive-behavioral interventions to reduce fear of falling (13, 19).

CONCLUSION

The findings from this study elucidate the significant correlation between lower extremity arthritis and an increased risk of falls among the elderly, emphasizing the profound impact of arthritis on daily functioning and mobility. The prevalence of difficulties in performing daily activities and a heightened fear of falling among the participants highlights the critical need for healthcare systems to implement multifaceted intervention strategies. These should not only focus on the physical rehabilitation to enhance strength and balance but also incorporate psychological support to address the fear of falling. Addressing these aspects can significantly improve the quality of life for elderly individuals with arthritis, underscoring the importance of integrated healthcare approaches in mitigating the adverse effects of this condition on the aging population.

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