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Presence of Fear of Fall in the Absence of Balance Deficits and its Impact on Quality of Life in Elderly Population

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Abstract: ***Background: Fear of Fall (FOF) is a self-perception of the ability to balance; it can limit an individual from performing Activities of daily life, though the individual does not have a skeletal or neurological cause for losing balance. Objectives: The objective of this study is to determine that fear of fall can occur even without balance problems and a history of fall, which impacts on quality of life in the Elderly population. Methods: Fifty elderly subjects, both genders, above 60 years, were recruited from old age homes and community-dwelling elderly people. Assessment of balance performed by the Berg balance scale (BBS). FOF was assessed by the Fall efficacy scale (FES-I). BBS scores above 45 were included in the study. Presence of FOF measured by FES-I was analyzed for its severity, gender and age variations, relationship with fall history, and BBS scores. Non-parametric testing was used to test the variables. Results: All 50 participants had severe FOF based on the FES-I score. Females had a higher FES-I score. Cohort of participants with a BBS score less than 51 with a history of fall had a higher FES-I score compared to other participants. Conclusion: FOF is found in the elderly without apparent risk for fall based on the Berg Balance Scale score. FOF with education on fall prevention, behavioral modification, and environment-specific training will be effective in preventing future falls. Clinical implication: Greater understanding is expected to increase quality of life in elderly individuals and for clinical practice.***

Keywords: Balance, Berg Balance scale, FOF, Falls efficacy scale – I, Quality of life

1. Introduction

Fear of fall (FOF) is defined as a lasting concern about falling that can lead an individual to avoid activities that he/she capable of performing. FOF has been associated with cognitive deficits, depression, lower extremity muscle strength, and balance deficits (Hoang, 2017). FOF has a negative influence on Quality of Life (Kulkarni, S, 2020). FOF can influence the balance ability of an individual and alter the attentional process, which is critical for balance and can result in loss of balance (Scheffer, AC, 2008). As FOF is a self-perception of the ability to balance, it can limit an individual from performing activities of daily life, though the Individual does not have a skeletal or neurological cause for losing balance (Mishra, N., 2017).

FOF is usually measured with the Falls Efficacy Scale – International (FES–I) (Parry, S.W., 2013). Balance impairment has been reported as a predictor for FOF in community-dwelling elderly women (Austin, N., 2007). Female gender, older age, less education, chronic illness, poor subjective health status, functional impairments, a history of falls, and depression were also reported as predictors for FOF. Among these, depression and poor subjective health status were significant predictors of FOF (Park, J, 2017). (Parry, Finch, and Deary, 2013) states that FOF is not being managed as a primary impairment and is not included as a primary outcome in the majority of the studies related to fall prevention. The author also mentions that interventions targeted to improve balance do not improve fear of falling and recommends that FOF-related psychological factors must be addressed in fall prevention strategies.

The Berg Balance scale is a commonly used measure for balance. BBS has been used to predict the risk of falls in community-dwelling elderly (Muir, S.W., 2008). The Berg Balance Scale (BBS) was developed as a clinical measure of functional balance in the elderly population (Berg, K.O., 1992), and the Berg Balance Scale has been used to identify people at high risk for falling. BBS has been used to validate the Falls Efficacy Scale – International (FES-I), a commonly used tool for FOF.

As FOF is a complex and multidimensional psychological manifestation, we were interested in finding the presence of FOF in community-dwelling elderly without an apparent balance deficit severe enough to result in fall as measured by a balance outcome measure. Earlier studies have mentioned co-existence of balance deficit and FOF, but not the presence of FOF in the absence of balance deficit. We tested for FOF in subjects without a balance deficit, its severity, and impact on functions.

2. Methodology

The study was approved by the Research Advisory Committee of the department.

Participants

Both genders, above 60 years, BBS score above 45 were included in the study. Individuals with cognitive deficits who cannot score FES-I, individuals having physiological deficits preventing the administration of BBS, and history relating to vestibular disturbances were excluded. Participants who met

the inclusion criteria were included in the study after receiving informed consent.

Subjects were recruited from Old Age Homes and community-dwelling elderly people in Chennai, Tamil Nadu and Tirupathi, Andhra Pradesh.

Instrumentation

Berg Balance Scale

The Berg balance scale is a 14-item scale designed to measure balance of older adults in a clinical setting. A score of < 45 indicates individuals may be at greater risk of falling. The Berg balance scale is rated on a 4-point scale for each activity, where 0 = unable to stand 30 seconds unsupported,1=needs several tries to stand 30 seconds unsupported, 2 = able to stand 30 seconds unsupported, 3 = able to stand 2 minutes with supervision, 4=able to stand safely for 2 minutes. The total score is 56.

Falls Efficacy Scale

The Falls efficacy scale - I (FES-I) consist of 16 items that include the 10 original items from the FES and 6 more demanding items that assess walking on slippery, uneven, or sloping surfaces, visiting friends or relatives, going to a social event, or going to a crowded place. Falls efficacy is rated on a 4-point scale for each activity, where: 1 = not at all concerned, 2 = somewhat concerned, 3 = fairly concerned, and 4 = very concerned. The total score ranged from 16 (no concern about falling) to 64 (severe concern about falling).

Procedure

The Berg Balance Scale was administered and scored. History of fall in the last year was noted as “yes” or “No”. FES-I (English version) was administered as a self-reported measure or through face-to-face interviews based on the educational level of participants.

Data Analysis

The descriptive statistics were used for age, gender, history of fall, and total FES-I score of the participants. The distribution of concern about fall across the FES-I item among the participants was analyzed. The distribution of mild, moderate, and severe FOF based on FES-I scores was analyzed.

The difference in FES-I score between groups based on BBS cut-off score and history of fall, gender, and age (≤64yrs and >64yrs) was tested with the Mann-Whitney U test.

3. Results

This study was done on 50 subjects, and the result was analyzed. Table 1 shows the demographic variables of the participants. The median and range of the FES-I score of the participant were 51.5(42-58). The scores of FES-I can be categorized as severe concern for falling.

Participants with a history of falls had higher concern for falls, however, not statistically different from those without falls. There was no gender difference in FES-I. Age of the participants, divided as elderly and non-elderly, did not influence the FES-I scores. Participants with a BBS score below 51 and a history of fall had significantly higher FES-I score, higher concern about Fall (Ref. Table 2).

Table 1: Demographic values of Participants

Category	N	Median (SD) / n%
Age		
≥65 years	43	69.9 (4.4%)
≤65 years	7	62.7 (0.7%)
Gender		
Male	22	44%
Female	28	56%
History of falls		
Yes	21	42%
No	29	58%

Mann-Whitney U test.

Table 2: Influence of Demographic variables on Fear of fall

Category	N	FES-I Mean (SD)	Median (Range)	P value
History of fall + Fear of fall				
Yes	21	52.47 (4.2)	55 (42–58)	< 0.07
No	29	50.81 (3.3)	50 (42–57)	
Having risk of fall				
BBS <51 + History of Fall	32	53.16 (4.1)	55 (42–57)	< 0.01 *
Others*	18	50.59 (3.3)	50 (42–58)	
Fear of fall + Age				
Age < 65	7	50.14 (3.4)	49 (45–55)	< 0.17
Age ≥ 65	43	51.7 (3.8)	52 (42–58)	
Gender				
Female	28	52.14 (3.8)	52.5 (42–58)	< 0.16
Male	22	50.72 (3.6)	50.5 (42–57)	

Mann-Whitney U test; p value significant < 0.05
*BBS<51 + FALL BBS<51 - FALL BBS > 51 + FALL BBS > 51- FALL

4. Discussion

The present study showed that FOF can exist in the absence of a balance deficit severe enough to result in a fall. BBS is commonly used to measure balance. Community-dwelling elderly are categorized to be at risk of fall when the score is below 45. This cutoff score is useful to predict multiple falls in the future. Hence, we excluded subjects with BBS scores of 45 and below from the study. We assumed that FOF, being a psychological condition related to falls, it is likely to be absent or minimal in subjects with scores above 45 on the BBS. FOF measured with FES-I is divided as low concern to fall (16-19), moderate concern to fall (20-27), and severe concern to fall (28-64) (FES-I,.2021). The participants of this study had a severe concern about falling, with a median score of 51.5(42-58). Earlier studies had reported that females have more FOF (Párraga Martínez I,.2010). But in this study, such a difference was not observed. However, females had a slightly higher median score than males.

A debate about the fear of fall leading to fall and fall leading to fear of fall has always existed. (Lavedan,. 2018) states that 41% of subjects reported FOF had a fall 24 months later. However, FOF was not a predictor for falls. The fall in the previous year was a predictor of fall. In our study, though participants with a history of falls had slightly higher scores in FES-I, the difference in scores between fallers and non-

fallers was not statistically significant. The participants of this study had higher concern for fall or FOF even without a history of fall. BBS has been used to validate FES-I in different populations. Studies have also reported a correlation between BBS scores and FES-I. (Sivakumar and Radika,. 2012) reported that the FOF harmed the scores of the BBS. (Shumwaycook, 1997) suggests that future falls can be better predicted in the BBS score is combined with a history of falls. A BBS score less than 51 with a history of fall is more associated with a future history of fall. In this study, we divided the subjects with this cutoff in BBS scores with and without a history of fall. The FES-I score in the subjects BBS score less than 51 and a history of fall was higher than other participants. This reflects the concern for falls are higher in this group of participants. We could not find earlier studies that used this criterion to analyze the fear of falls in the elderly. The majority of the earlier studies used a cut-off value of 45 and below as a risk factor for falls. (Muir,.2008) states that the predictive value of BBS with the cut-off value is not good enough to find the majority of people likely to fall in the future.

Analysis of activities with an increase in concerns for fall will provide a better scope for counseling and treatment planning. (Deshpande, 2009) Reports that a significant functional difference is identified between individuals expressing FOF for community activities and activities in a home environment. In the present study, participants have reported higher concerns for falling while walking on a slippery surface, walking on a slope, walking on an uneven surface, walking in a crowd, going to a social gathering, and walking up and down the stairs. (Kader,. 2016) studied the fall-related activity avoidance in Parkinson's patients with the modified Survey of Activities and Fear of falling in the Elderly (mSAFE) instrument and reported walking on slippery surfaces, going to crowded places, and going up and down stairs as a few activities avoided by around 50% of the patients. The authors suggest that fall-related activities must be addressed at the earliest, even though a fall does not occur. (Parry, finch, and deary, 2013) states that FOF is not addressed as a primary outcome in the majority of fall-related studies. Tai-chi, exercise interventions, fall fall-related multifactorial programs were a few interventions tested to reduce FOF (Liu TW, 2018). FOF can result in changes in postural control and result in falls. Falls are preventable, however, reluctance to change behavior in the elderly to prevent falls is a concern (Boyd, R,. 2009). Cognitive behavior therapy is a promising intervention to reduce FOF. Inclusion of a method to identify FOF and therapy to manage FOF in a fall prevention program will be more effective to prevent falls in the future (Maritz CA & Silbernagel KG, 2016).

5. Limitations

Though we identified that FOF can exist in the absence of a balance deficit, the cognitive aspects that lead to FOF, specific environmental factors provoking FOF, or the presence of other predisposing factors for FOF, like visual deficits, were not explored. Exploring these aspects can provide better insight into FOF.

6. Recommendations

This study revealed that FOF could be the primary entity without a predisposing balance deficit. Interventions not limited to improving balance but also to reducing FOF can be one of the methods to improve the functional ability of the elderly.

7. Conclusion

FOF is found in the elderly without apparent risk for fall based on the BBS score. Fall is one of the common causes for FOF. The FOF limited the participants of this study to move in a crowded environment and on uneven surfaces. Addressing FOF with education on fall prevention, behavioral modification, and environment-specific training will be effective in preventing future falls.

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