



Original Research Article

Correlation between fear of fall, balance and physical function in people with osteoarthritis of knee joint

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Abstract

Introduction: Osteoarthritis is a degenerative joint disease. Fear of fall and balance impairment in people with osteoarthritis of knee joint is a major cause of loss of independence, which has an effect on the physical function in them. The aim of the study was to correlate fear of fall with balance scores and with physical function in people with osteoarthritis of knee joint.

Material and methods: A correlational study was conducted at college of physiotherapy where fear of fall, balance impairment and physical function were assessed in 30 subjects, both males and females, diagnosed having osteoarthritis of knee joint. Exclusion criteria were subjects with history of neurological diseases, fracture or total joint replacement within the previous 6 month or acute illness or injury on the day of the functional assessment. Outcome measure included Fear of fall measured using falls efficacy scale-International (English) (FES), balance was measured using Berg balance scale (BBS) and physical function was assessed using modified WOMAC index (CRD Pune version). Level of significance was kept at 5%. Spearman correlation was applied to find the correlation between FES and BBS and between FES and WOMAC. All the data were analyzed using SPSS16.

Results: A moderate negative correlation was found between FES and BBS ($r=-0.520$, $p=0.002$) and a positive moderate correlation between FES and WOMAC ($r=0.666$, $p<0.001$) which were significant.

Conclusion: The study concluded that there is a correlation between fear of fall and balance and physical function in subjects with osteoarthritis of knee.

Key words

Osteoarthritis knees, Physical function, Balance, Fear of fall.

Introduction

Osteoarthritis (OA) is a degenerative joint disease [1]. Though OA can occur in all joints due to ageing, it is more commonly seen in weight bearing joints like knee, hip, ankle and spine. Finger joints are also frequently affected. Among all the joints in the body osteoarthritis affects the knee joint most [2].

Fear of fall and balance impairment in people with osteoarthritis of knee joint is a major cause of loss of independence which may have an effect on the physical function in them. According to Harrison AL et al functional self efficacy is an important factor affecting the functional performance outcome for people with OA of the knee [3]. Hassan BS concluded that compared with age and sex matched controls, subjects with symptomatic knee OA have quadriceps weakness, reduced knee proprioception, and increased postural sway. Pain and muscle strength may particularly influence postural sway. The interaction between physiological, structural, and functional abnormalities in knee OA deserves further study [4, 5].

So the aim of this study was to correlate fear of fall with balance scores and with physical function in people with osteoarthritis of knee joint.

Materials and methods

A correlational study was conducted at the S.B.B. College of Physiotherapy, VS General Hospital, Ahmedabad. 30 males and females having OA of knee joint diagnosed by Orthopedic Department, VS General Hospital according to American College of Rheumatology Criteria (ACR) for OA knee (**figure - 1**) were

included. Subjects with neurological diseases, fracture within previous 6 months, total joint replacement or injury were excluded. Convenience sampling technique was used in the study examining correlation between fear of fall, balance and physical function in people with osteoarthritis of knee joint which was conducted for a period of one month in November 2014.

Pain was measured using numeric rating scale (NRS), Fear of fall was measured by falls efficacy scale-International (English) (FES), Balance was measured using Berg balance scale (BBS) [6] and Physical function was assessed using modified WOMAC index (CRD Pune version).

Berg balance scale developed by Berg and coworkers is an objective measure of static and dynamic balance abilities. The scale consists of 14 functional tasks commonly performed in everyday life. Scoring uses a five point ordinal scale with scores ranging from 0 to 4. A score 4 is used to indicate that the patient performs independently and a score 0 is used for unable to perform. A maximum score of 56 points is possible. A score of 45 or below is associated with a high fall risk and each one point drop in score ranging from 54 to 36 is associated with a 6 to 8 percent increase in fall risk [6]. The inter rater reliability of Berg Balance Scale was determined interclass correlation coefficient (ICC) = .98, for individual items, reliability ranged from .71 to .99 (6). FES is a reliable and valid measure of fear of fall in Turkish older people, FES individual item ICC ranges from 0.97 to 0.99 [7].

All the participants gave their informed consent in English or Gujarati. Demographic data and outcome measures were taken. Fear of fall, balance impairment and physical function were



assessed in 30 subjects. Statistical analysis was done using SPSS V 16. Level of significance was kept at 5%.

Results

Demographic data of subjects and mean of NRS was as per **table - 1**. Correlation between the FES and BBS where a moderate negative correlation was seen was as per **graph - 1**. Positive moderate correlation between FES and WOMAC was as per **graph - 2**.

Discussion

This study aimed to show the correlation between fear of fall, balance and physical function in subjects with OA knee. It showed a negative moderate correlation between FES and BBS and a positive moderate correlation between FES and WOMAC which were statistically significant. The correlation between the fear of falling and balance found in present study was in agreement with findings of Maki et al. Fear of falling contributes to explaining self efficacy, indicating elderly people who report high score of self-efficacy scales not only have impaired balance, but also are fearful that they are likely to fall due to this limitation [8]. Studies also show that older adults who report a fear of falling demonstrated large amplitude of postural sway when blind folded and score when timed on a leg stance test compared to those who did not report fear of falling [8].

Similar findings were reported from studies that investigated fear of falling and restriction of activity and self reported declines in mobility and reduced physical function in people with low fall related self efficacy. It is unclear whether impaired balance has an impact on falls efficacy in a deterioration of balance ability [8]. Another study by Hinman et al measured static postural sway (antero-posterior, lateral and total) using a swaymeter on two different

surfaces and under two visual conditions and dynamic standing balance was assessed using the 'step test'. They concluded that balance deficits can be identified in the osteoarthritic population using simple, inexpensive measures. However, the clinical relevance of the small deficits identified remains unknown and warrants further investigation [5].

Harrison A et al concluded in 2004 that the functional self efficacy is an important factor affecting the functional performance outcome for people with OA of knee [3]. Young Hoo P et al concluded that the standing balance was related to physical function in patients with OA knee [9].

Thus rehabilitation protocol for osteoarthritis of Knee joint should include exercises to improve balance, physical function and thus decrease fear of fall.

Conclusion

The study concluded that there is a correlation between fear of fall and balance and physical function in subjects with osteoarthritis of knee.

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Figure – 1: ACR clinical classification criteria for OA of knee.

ACR Clinical Classification Criteria for Osteoarthritis of the knee:

Using history and physical examination -

Pain in the Knee

And 3 of the following

Over 50years of Age

Less than 30 minutes of morning stiffness

Crepitus on active motion

Bony Tenderness

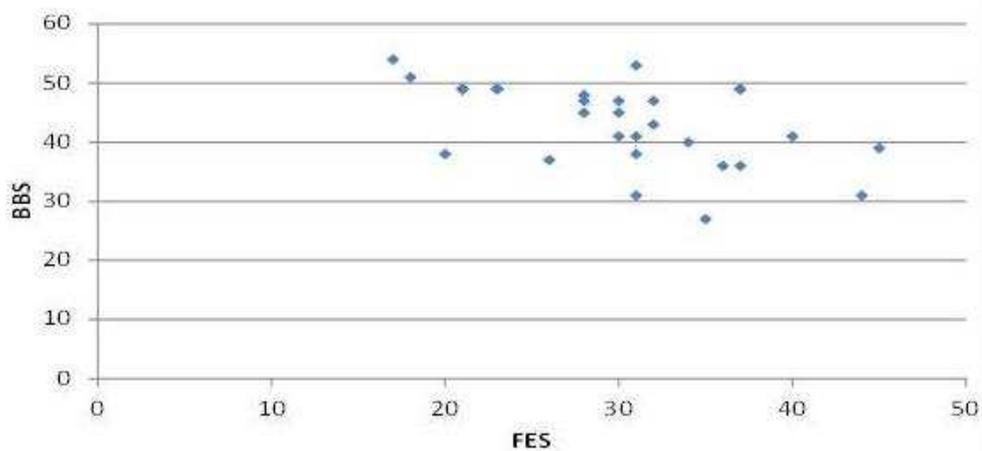
Bony Enlargement

No palpable warmth of Synovium

Table 1: Demographic data

Age : Mean \pm SD (years)	53.63 \pm 8.739
No. of males/females	5/25
NRS mean \pm SD	6.333 \pm 1.768

Graph 1: Correlation of FES & BBS



Graph 2: Corelation of FES & WOMAC

