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Effect of Kinesiophobia on WOMAC, Balance and Range of Motion in Post Total Knee Arthroplasty Patients

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Abstract
According to recent researches fear of pain and even more avoidance of movement are strongly correlated both with the acute postoperative pain perception and recovery after surgery up to 1 year, thus presenting a relevant clinical impact on the outcome after TKA. This placed a need to identify the presence of fear of fall in post TKA patients and to check whether kinesiophobia might effect a person's final outcomes in balance, function and range of motion post TKA. In the present study the effect of kinesiophobia in post TKA patients was evaluated. In addition its impact on kinesiophobia, balance, range of motion and physical functions in post TKA patients was assessed. The results showed that fear of fall has a significant severe effect on balance of the subjects with bilateral group than the moderately affected unilateral group which leads to more functional limitations having high WOMAC scores which is an indicator of functional abilities. Fall risk had no effect on knee ROM in either of the groups. Overall this study came to a conclusion that kinesiophobia positively effects balance and function in post TKA patients.

Keywords
Kinesiophobia, Proprioception, Fear of fall.

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INTRODUCTION:
Osteoarthritis (OA) is a common chronic condition resulting in pain, fatigue, functional limitations, locomotor disability, increased health care utilization and high economic costs to society.[1,3] Osteoarthritis (OA) affects the joint by causing focal areas of loss of articular cartilage within the synovial joints and it is associated with bone hypertrophy and capsular thickening.[6] The knee is the most commonly affected weight-bearing joint. Knee osteoarthritis (OA) is a major public health concern worldwide and one of the foremost causes of chronic disability in older adults as it reduces physical function and diminishes quality of life.[5,2] Impaired proprioception also has been reported for the patients suffering from knee osteoarthritis leading to degeneration of the knee.[7] The prevalence of OA increases with age and if pharmacological and conservative treatments do not releases symptoms joint replacement is recommended.[9,7] Surgery, particularly total knee replacement, can be of great value as it is efficacious, improves quality of life, as well as reduces pain and improves function.[10,8] However, the modern TKA is considered a successful intervention with 90% of patients at long-term follow up reporting reduced pain and improved functional ability. Despite these improvements, patients continue to exhibit long-term functional deficits and to report difficulties with lower limb function during activities of daily living

(ADL).[4] Although different results may be related to TKA, range of motion (ROM) recovery is essential for functional outcome.[15] Ninety-five degrees of knee flexion has been shown to allow activities of daily living to be carried out, therefore restoration of post-operative ROM is considered a major indicator of the success of a TKA.[16,17]

Kinesiophobia (Fear of falling) is common in older people and associated with serious physical and psycho-social consequences.[11] Generally, one third of community dwelling older adults who have one or more falls each year represents a significant threat to independence and quality of life.[13,12] Moreover, it has been noted that among individuals who fall, there is a high percentage (40–73%) who have a fear of falling.[12] Exercise may reduce fear of falling by improving strength, gait, balance and mood, and reducing the occurrence of falls.[11]

According to recent researches fear of pain and even more avoidance of movement are strongly correlated both with the acute postoperative pain perception and recovery after surgery up to 1 year, thus presenting a relevant clinical impact on the outcome after TKA. This placed a need to identify the presence of fear of fall in post TKA patients and to check whether kinesiophobia might effect a person's final outcomes in balance, function and range of motion post TKA.

METHODOLOGY:

A total number of 30 subject were selected from Synergy Institute of Medical Sciences, Dehradun, Max Hospital Dehradun, Various health center and Rehabilitation clinics in Dehradun.

Inclusion Criteria

a. Age between 50 to 75
b. Both genders included
c. Unilateral and Bilateral TKA
d. Minimum 6 month after surgery and maximum 1 year.

Exclusion Criteria

a. Any other lower limb surgery
b. Any deformity at ankle joint
c. Mentally unstable condition
d. Any recent lower limb fracture within last 6 month
e. PNI (lower limb)
f. Any infected or unhealed wound.

Subject with TKR (minimum 6 months after surgery) were selected on the basis of inclusion and exclusion criteria and were recruited for the study. Method and the purpose of the study was explained to the patients. Written consent form was signed by the patients for the participation on this study. The subjects were divided into unilateral TKA group (A) and Bilateral TKA group (B).

Outcome Measure Used

TAMPA scale for Kinesiophobia (r=0.956)[21]
Berg Balance Scale for Balance (r=0.98/0.99)[19]
WOMAC for ADLS (r=0.80-0.98)[18]
Goniometer for Knee Joint ROM (r=0.98)[20]

DATA ANALYSIS

The data was analysed using SPSS version 14.0 software. Pearson correlation was used to find correlation.

T-Test was used to compare the data between Unilateral and Bilateral Total Knee Arthroplasty patients. The statistical significance was set at 95% confidence interval and p value ≤0.05 was considered significant.

RESULTS:

The results depicted that Group A showed severe fear of fall with mean value 43.533 ±3.888

VARIABLE	GROUP A		GROUP B	
	MEAN	SD	MEAN	SD
TAMPA	43.533	3.88893	44.667	3.01583
BBS	45.533	3.31375	30.000	3.11677
WOMAC	22.773	5.25154	41.037	5.95535

Table 5.1: Descriptive analysis of Age, Weight, TAMPA, BBS and WOMAC

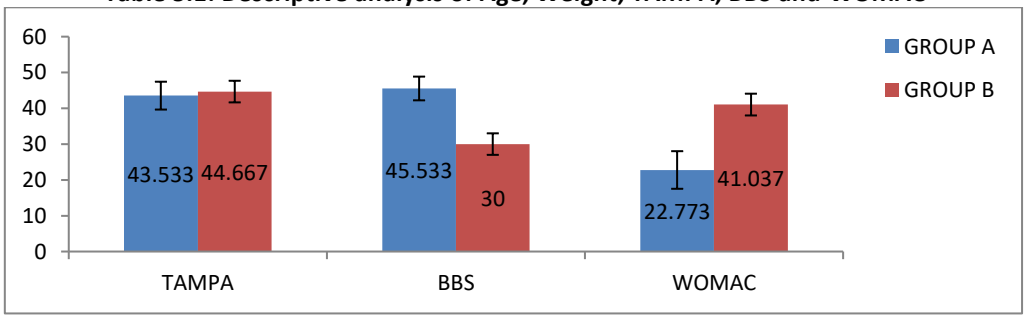

Fig. 5.1: Analysis of TAMPA, BBS and WOMAC

The results showed that GROUP A and GROUP B subjects fall under high fall risk on BBS with mean value 45.533 ± 3.31375 and 30.000 ± 3.11677 respectively. The results showed GROUP B to be more functionally limited as compared to GROUP A with lower values of WOMAC.

The results showed non-significant difference between the readings of TAMPA scale of GROUP A with GROUP B.

In GROUP A, subjects with unilateral TKA showed significant correlation between TAMPA and balance and non-significant correlation between TAMPA and range of motion ROM Flexion (p=0.485) ROM Extension (p=0.466) respectively.

In GROUP B, subjects with bilateral TKA showed significant correlation between TAMPA, balance (BBS) and function (WOMAC) and non-significant correlation between TAMPA and range of motion ROM Flexion RT (p=0.094), ROM Extension RT (p=0.422) and ROM Flexion LT (p=.0241) and ROM Extension LT (p=0.109) respectively.

DISSCUSSION:

Total knee arthroplasty (TKA) has revolutionized the care of patients with end-stage knee arthritis. Post physiotherapy management plays a very important role in patient wellbeing and achieving functional abilities after TKA.

In our study both the groups showed severe fear of fall on TAMPA scale of kinesiophobia, depicting the presence of kinesiophobia in patients with TKA. In support of our results ***Hafez*** *et al* in their study added that fear of movement occurred in a substantial proportion of patients after TKA and it was associated with knee pain, flexion and function. The reason of which could be proprioceptive fear of movement.[1] Kinesiophobia affects both recovery time and final outcome in patients with total knee arthroplasty. Fear of pain and even more avoidance of movement are strongly correlated with acute post-operative pain perception and recovery time after surgery. [2]

The patients with kinesiophobia walk shorter distances which affects the recovery of knee function. According to fear avoidance model various psychological factors such as pain catastrophizing and kinesiophobia can be a risk factor for persistant pain and disability. The influence of these psychological factors on post-operative pain and functional recovery play a role in total knee arthroplasy patients.[3] B***jerke*** *et al.* in their study concluded that a recent history of falling is common in people undergoing TKA and 45% of patients fall again in the year following surgery.[4] Therefore the interventions to reduce the risk of falls should be implemented early after the surgery.[5] Our study worked on the different aspects on which these interventions should work. Postoperative complaints can perhaps be explained by a loss of proprioceptive capabilities, especially at the 60 degree angle. Rehabilitation should pay more attention to the remaining receptors.[7]

In the results of the present study both unilateral and bilateral TKA patients fall under high risk fall on Berg Balance Scale. Fear of falling can also be related to balance difficulty due to lack of proprioception. Proprioception is known to be a critical source of sensory feedback for the preservation of balance during upright standing. It is generally accepted that human bipedal upright stance is achieved by feedback mechanisms that generate an appropriate corrective torque based on body-sway motion detected primarily by visual, vestibular, and proprioceptive sensory system. Thus, proprioception largely contributes to postural regulation. Loss of proprioceptive sense due to artificial joint structure can be a contributive factor in balance loss. The fear of fall can be due to decreased sense of joint stability resulting in lack of balance.

Our results suggest that kinesiophobia and balance may influence functional recovery after total knee arthroplasty and should be assessed in patients hospital stay for early rehabilitation after total knee arthroplasty. Our study depicted that interventions should be focused on balance and fear of fall in patients with TKA. This will help to identify patients prone to slow recovery and developing a proper rehabilitation protocol. Interventions that targeted kinesiophobia could be used for these patients to assist in their functional recovery. Therapeutic control of kinesiophobia could be included in the rehabilitation program.

CONCLUSION:

The present study depicted that fear of fall was present in both unilateral and bilateral TKA subjects. In addition the subjects with bilateral TKA are at more fall risk than subjects of unilateral group which leads to more functional limitations having high WOMAC scores. Fall risk had no effect in knee ROM in either of the groups or were not significant to be considered. Overall this study came to a conclusion that kinesiophobia positively effects balance and function in post TKA patients.

Future studies could be done on other variables like Gait patterns, psychological wellbeing, social activities and limitations in post TKA patients. Exercises could also be aimed to decrease kinesiophobia in post TKA patients should be figured out via different trials on TKA subjects.

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