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Influence of Severity of Knee OA and Its Association with Physical Function in Community Dwelling Older Adults

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Abstract: ***Background: Osteoarthritis of knee is active disease process involving cartilage destruction, subchondral bone thickening and new bone formation[1.] OA is the commonest cause of disability in older adults[2.] Difficulty in transferring, that is, Ability to move in and out of the chair is common[3.] Rising from chair is basic activity of daily life. So it is important to assess,the physical performance can be easily understood an observable ability to perform a task e.g. Rising from the chair. Few studies compared knee OA to healthy controls butthose that did found that people with knee OA performed significantly worse. More research is needed to understand the extend of balance impairment in knee OA using easy to administer, clinically- available tests. Also no studies compared between knee OA severities thus expected changes in balance as the disease progress remain unknown[4.] Aim: To find out the influence of severity of Knee OA and its Association with Physical function in older adults. Objectives:1. To study influence of severity of Knee OA knee in Community Dwelling Older Adults. 2. To Assess Physical Function in community Dwelling Older Adults. 3.To find Association between severity of OA and physical function. Procedure: Ethical clearance taken from institutional ethical committee of DVVPF's COPT Ahmednagar, Informed consent was taken from patient and patients were included based on inclusion and exclusion criteria then after demographic data collection patients were examined clinically for ACR criteria for severity of OA knee and physical performance test that is Five Times Sit to Stand Test was administered and time was recorded. Data analysis: -Done with the repeated measures analysis of variance difference of mean time between the groups calculated and multiple comparison post-test Tukey as p<0.05. Results: The study shows that the p value is 0.001 considered extremely significant variation among column means is significantly greater than expected by chance. Conclusion: The results and Data analysis shows that the time required for FTSTS test was significantly greater in severe Knee OA group hence the severity of OA has a greater influence on Physical function.***

Keywords: Knee OA, Physical Function, Five Times Sit to Stand test, Older Adults

1. Introduction

Osteoarthritis is the second most common diagnosis in older adults and also a commonest cause of disability in older people[1.] Osteoarthritis is an active disease involving cartilage destruction, subchondral bone thickening and new bone formation[2.] Osteoarthritis includes changes in ligaments, tendons,joint capsule and muscles[3,4.] subjects with Knee OA are known to have impaired proprioception[5,6.] Difficulty in transfer from chair to bed or from bed to chair is common in aged above 65[7.] Rising from bed or chair is basic activity of daily leaving and it is considered more demanding than walking and stair climbing due requirement of greater torque and Range of Motion[8.] functional limitationsmost commonly assessed by the physical performance test in which a subjects are asked to perform a specific task or series of task and it is evaluated in objective standardized manner using predetermined criteria which may include counting repetitions or timing of activities as appropriate[10.] The Physical Performance is commonly understood by observable ability to perform task e.g. rising from chair.

The Sit-to-Stand test is commonly used measure in clinical research and practice the test involves measuring the time taken to stand from seated position either one, three, five, ten times or recording the repetitions undertaken in given period[11.] The FTSTST measures ability to perform functional transitional movement.

2. Aim

The Aim of study is to observe influence of severity of Knee OA and its Association with the Physical function in Community dwelling older adults.

Objectives

1) To classify patients according to OA severity.
2) To test for Physical function.
3) To find Association between severity of OA and Physical function.

3. Materials and Methodology

- **Study design:** Observational cross-Sectional study
- **Study duration:** 6 Months
- **Sampling method**: Purposive Sampling
- **Target Population:** Older People with Knee OA
- **Sample size:** 18.

3.1 Eligibility Criteria

Inclusion criteria

- Age- 60 & above
- Older adult leaving independently in community
- Diagnosed with Knee OA

Exclusion criteria

- Presence of any medical condition other than Knee OA that could compromise Physical function.
- History of U/L or B/L Knee or Hip replacement surgery.

3.2 Outcome

- ACR criteria to measure Knee OAseverity.
- Five-times-sit-to-stand Test.

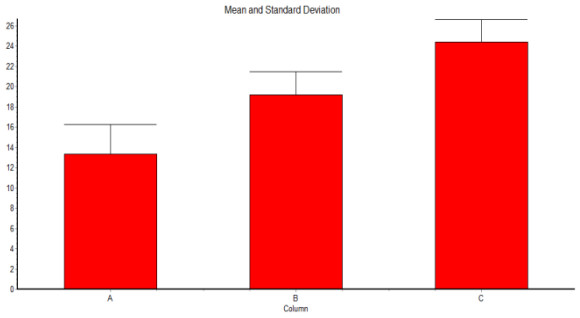
4. Procedure

Ethical committee clearance was taken from institutional ethical committee of DVVPF's COPT. The participants were included in study from various Physiotherapy camp held at Ahmednagar district and also from a local senior center at Ahmednagar city and patients from OPD in a Hospital. As per the Eligibility criteria after informed consent from the patient.

After taking a demographic data the participants were categorizes according to severity of Knee OA according to ACR clinical criteria, then five-times-sit-to stand test was administered and time was recorded.

5. Data Analysis

Three groups according to severity of OA as follows as per ACR criteria Group-A Mild, Group-B Moderate and Group-C sever, and time taken by participants were noted, mean and SD was calculated for each group (Graph 1) and ANOVA shows the p value is 0.0001 considered significant. Graph-1.



*Group A- Mild OA, Group B- Moderate & Group C- severe OA on X-axis and time taken for FTSTS test time is at Y-axis.

Table 1

Group	Age (Mean SD)
Group A	66
Group B	72.6
Group C	67.5

Table 2

Group	Number of points	Mean	SD	SEM	Median
Mild OA	6	13.35	2.91	1.18	12.36
Moderate OA	6	19.20	2.24	0.91	18.73
Severe OA	6	24.42	2.20	0.90	24.60

*SD Standard deviation, SEM standard error of mean

6. Results

Demographic Data Age, Gender, BMI was studied in population (Table 1). Mean & SD for FTSTST was done according to severity of OA also comparisons done between groups which shows the time for FTSTST was increased as the severity of OA i.e. The time was significantly higher in Severe group (Table 3) when compared with the Mild OA group. We can see in (table 4) the time for FTSTS test recorded in our study compared with the normative values given as per Age in healthy individuals as per study done by (Bohannon R. W 2006)

Table 3

Group	Mean	P- value
Mild vs Moderate	-5.85	P<0.01
Mild vs severe	-11.58	P <0.001
Moderate vs severe	-5.21	P <0.05

Table 4

Group	Age (mean age)	FTSTS time in study population	FTSTS test time for Age
Group A	66	13.35	11.3(60-69)
Group B	72.6	19.20	12.6(70-79)
Group C	67.5	24.42	14.8(80-89)

*Group A- Mild OA group, Group B- Moderate OA group, and Group C- severe OA group.

7. Discussion

The sit-to-stand motion is a frequently executed activity that is affected by weakness in the quadriceps femoris muscle and knee joint pain in patients with knee OA. Eriksson Naili et al,2017, found that five times sit-to-stand test sensitive measure of functional compensations typical of knee OA pathology[12].Timed sit-to-stand test are probably the most often used functional strength tests. the given study was conducted at community level in rural population and The study included subjects with OA knee and grouped in three groups according to severity all groups were assessed for physical function if there was co-relation with OA knee severity findings of study suggest that the time required to perform the FTSTS test was increased as the severity of the OA. As per values in (Table 4) shows time required for FTSTS test as per Age range we can see here the time increased as per severity of OA and not as per the Age. Hee-Sang Kim et al 2011, Observed that moderate to severe OA patients had diminished balanced control compared to mild OA patients and we were able to deduce that a decrease in muscle strength, proprioception, and increased pain contributed to postural instability[13]. The results of our study show that the time required for completion of test was higher in the Group C i.e. the sever OA group when compared with the time for Group A & Group B Mild and Moderate OA group.

8. Conclusion

The study included subjects with OA knee and grouped in three groups according to severity of OA as per ACR criteria, the findings of the study suggest that the time required for FTSTS test was higher for severe knee OA group when compared with mild or moderate group. Hence

the severity of OA knee severity has greeters influence on Physical function.

Even though the time required for test was increased the patients in rural population performed better than urban sedentary population. Further studies can be done with the comparing the sedentary and physically active individuals in urban and rural community.

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