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RESEARCH ARTICLE

ASSOCIATION OF PHYSICAL PERFORMANCE AMONG COMMUNITY DWELLING ELDERLY POPULATION WITH AND WITHOUT KNEE JOINT OSTEOARTHRITIS: CROSS-SECTIONAL STUDY

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ABSTRACT

Background: Knee-osteoarthritis (OA) is a degenerative articular cartilage disease, combined with variable and gradually advancing thigh muscle weakness leading to functional impairments. The population worldwide, is ageing and age-related osteoarthritis is the leading cause of disability, radiographically evident in one out of four individuals between 56–84 years' old. Osteoarthritis is the primary cause of long-term disability and is ranked second among all pathologies that result in reduced physical activity of all joints, the knee is most frequently affected by OA, which leads to the greatest loss in functional performance and incurs the highest social costs as compared to any other type of arthritis or site of OA. **Purpose:** The purpose of this study is to find the association of physical performance among community dwelling elderly population with and without knee joint osteoarthritis. **Subject and Method:** 12 subject were selected on the basis of inclusion and exclusion criteria. Subjects were selected by convenient sampling method. They were divided into 2 groups of knee osteoarthritis and without knee osteoarthritis. To evaluate physical performance in elder's time up and go test was conducted. The time taken to complete the task of TUG is recorded and then analyse. **Result:** Time taken to complete the time up and go test was analysed and compare between groups of knee osteoarthritis and without knee osteoarthritis by Unpaired t test (pvalue = <0.0001). Age was compared in between group and it came not significant. BMI in participants with knee OA was higher than in participate without knee OA. When KL Grading and TUGT was compared in group A pvalue: <0.0001 extremely significant. As KL grading was higher the time taken to complete TUGT was also more. **Conclusion:** Participant with knee joint osteoarthritis takes more time to complete the TUGT than participant without knee osteoarthritis. BMI in participant with OA was higher than in participant without OA. Higher KL Grading value also leads to more time to complete TUGT.

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INTRODUCTION

Globally, the population is ageing and the World Health Organization (WHO) predicts that, by 2050, the population aged 60 years or more will double, whilst those aged 80 years or more will number 400 million persons (Singh, 2014). Conventionally "elderly" has been defined as a chronological age of 65 years old or older, while those from 65 through 74 years old are referred to as "early elderly" and those over 75 years old as "late elderly" (Orimo *et al*., 2006). As people get older sensorimotor area gets deteriorate. The diminished functioning in sensorimotor system in old people can be limiting in maintenance of an independent lifestyle and can increase the risk of fall and fractures (Samson, 2000).

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Osteoarthritis (OA) is a common condition in the elderly, with a prevalence ranging from 10% to 30% in individuals ages 65 years[4]. Osteoarthritis is the primary cause of long-term disability and is ranked second among all pathologies that result in reduced physical activity of all joints, the knee is most frequently affected by OA, which leads to the greatest loss in functional performance and incurs the highest social costs as compared to any other type of arthritis or site of OA (Thomas, 2003). Pain and other symptoms of OA may have a profound effect on quality of life affecting both physical function and psychological parameters (Heidari, 2011). Adults with knee OA highlighted that it affected their activities of daily living. Knee OA leads to balance impairment in older adults. Individuals with obesity who presented with knee OA had declined endurance compared to healthy individuals without knee OA. In addition, older adults with knee OA have reduced hamstring flexibility leading to functional limitation (Ponvel,

2019). Worsening knee symptoms and physical inactivity form a cycle leading to reduced physical function and interference with activities of daily living (Davison, 2016). There is no awareness among the community dwelling elders about the knee joint pathology and the consequences of same on physical activity. Hence there are many study which has been carried on individually physical performance among knee joint osteoarthritis in elderly population. But none of the studies have been carried out to compare physical performance in patient with and without knee joint osteoarthritis. So this study is being carried out to know the relationship between physical performance in community dwelling elderly population with or without osteoarthritis. So the objective of the study will be, to find out the association of physical performance in community dweller's elders with knee joint osteoarthritis.

MATERIALS

Study design: Cross-sectional Study

Study setting: Senior Citizen Club, Old Age Home

Study population: Patient Aged 60 and more, Patient with and without knee joint osteoarthritis

Study material: Arm Chair**,** Measuring tape**,** Pen**,** Paper**,** Cones**,** Weighing machine, Stadiometer

Sample size: 12

Procedure: Samples are recruited according to convenient sampling method from senior citizen clubs and old age home care hospital Physiotherapy Outpatient Department. Ethical Committee approval was taken from Institutional Ethical committee of DVVPF's college of physiotherapy, Ahmednagar. Consent was taken from the participant and they were selected according to inclusion and exclusion criteria. All baseline characteristics were taken. Participants were assessed and then included in the study. Time up and go test (TUG) was explained to the patient and conducted. Data was collected and analyzed.

Time up and go test (TUG) procedure (Shumway-Cook, 2009):

- Begin the test with the subject sitting correctly (hips all of the way to the back of the seat) in a chair with arm rests. The chair should be stable and positioned such that it will not move when the subject moves from sit to stand. The subject is allowed to use the arm rests during the sit – stand and stand – sit movements.
- Place a piece of tape or other marker on the floor 3 meters away from the chair so that it is easily seen by the subject.
- Instructions: "On the word GO you will stand up, walk to the line on the floor, turn around and walk back to the chair and sit down. Walk at your regular pace.
- Start timing on the word "GO" and stop timing when the subject is seated again correctly in the chair with their back resting on the back of the chair.
- The subject wears their regular footwear, may use any gait aid that they normally use during ambulation, but may not
- be assisted by another person. There is no time limit. They may stop and rest (but not sit down) if they need to.
- Normal healthy elderly usually completes the task in ten seconds or less. Very frail or weak elderly with poor mobility may take 2 minutes or more.
- The subject should be given a practice trial that is not timed before testing.

RESULTS

Analysis was performed on Graph Pad In Stat Version 3.10, 32 bit for Windows. Analysis was performed on 12 sample with and without knee joint osteoarthritis. The mean and ± SD for age was 64.66 ± 5.04 and 69.16 ± 7.19 with and without knee joint osteoarthritis respectively. Baseline BMI mean ± SD was 27.51 ± 2.84 and 22.29 ± 2.23 with and without knee joint osteoarthritis respectively. P value for BMI was 0.0014 was is considered significant (Table 1). Time taken to complete the TUG test Mean ± SD in elderly with knee joint osteoarthritis was 15.94 ± 1.94 and without knee joint osteoarthritis was 10.79 ± 1.52. The Pvalue for TUG test was <0.0001 which is extremely significant. With knee osteoarthritis the elderly required more duration to complete TUG test than without knee joint osteoarthritis, shown in Table 2 and Graph 1. As the KL Grading of knee joint osteoarthritis and age increases the duration to complete the TUG test also increases Graph 2 and 3.

Table 1. Baseline Characteristics

	With Osteoarthritis	Without Osteoarthritis	
	mean SD	mean SD	Pvalue
AGE	64.66 ± 5.04	69.16 ± 7.19	0.1636
BMI	27.51 ± 2.84	22.29 ± 2.23	0.0014
KL Grading	2.66 ± 0.51		

Table 2: TUGT Comparison with Knee osteoarthritis and without Knee Osteoarthritis

	With Osteoarthritis	Without Osteoarthritis	
	mean SD	mean SD	Pvalue
time taken	15.94 ± 1.39	10.79 ± 1.52	< 0.0001

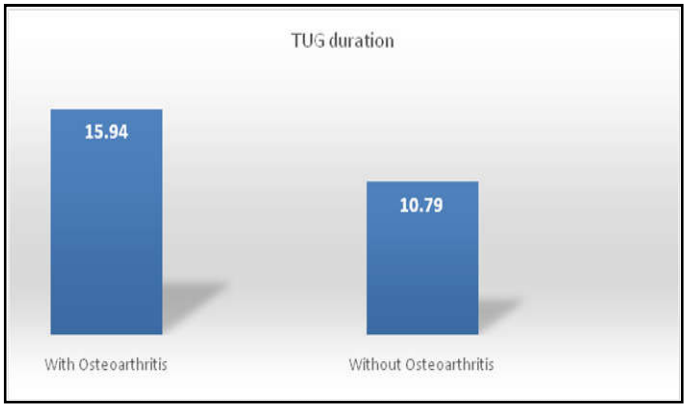
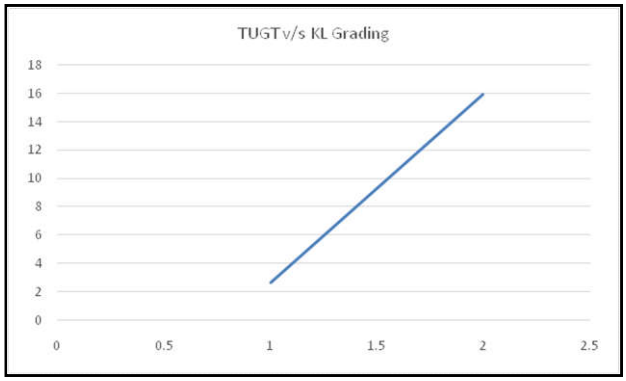


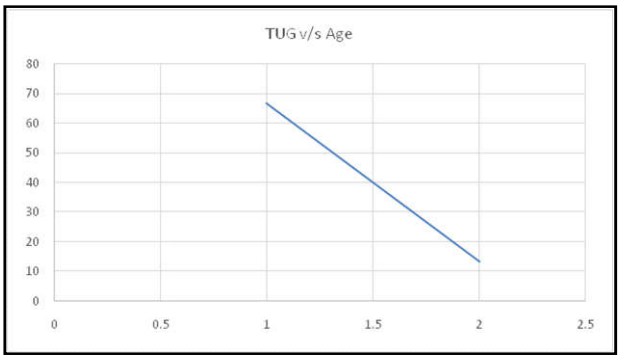
Table 2. TUGT Comparison with Knee osteoarthritis and without Knee Osteoarthritis

DISCUSSION

The present study suggested that elderly with knee joint osteoarthritis too longer duration to complete the TUGT and the elderly with knee osteoarthritis also had high BMI as compared to the elderly without knee joint osteoarthritis.



Graph 2: TUGT v/s KL Grading



Graph 3. TUGT v/s Age

Hop C. Davis *et al*. (2019) also did the study to know the association between BMI and physical performance in participants with knee joint osteoarthritis. In their study they said that, that BMI is not the predisposing factor of radiographic knee osteoarthritis but radio graphic knee osteoarthritis is the predisposing factor of high BMI. As the said that in radiographic knee osteoarthritis the person will have pain and he or she will avoid the physical activity and this could lead to increase in adipose tissue in body. This is the reason that in our present study the elderly with OA had high BMI and low physical performance (Davis, 2019). The present study suggest that the participants with knee osteoarthritis took longer duration to complete time up and go test than the participants without knee osteoarthritis. Tetsuyo Amano et.al quantified the walking ability in 621 Japanese elderly with knee joint osteoarthritis. The present study is consistent with this study. As they quantified the walking ability with 5Mwt and TUG and in their study also according to age and severity according to OA KL Grading the duration increase (Amano *et al*., 2018). Pavapriya Ponvel *et al*. compared physical performance between older adults fallers with and without knee osteoarthritis in 33 participants. In their study also the TUG duration in fallers with knee osteoarthritis was more than without knee osteoarthritis (Ponvel *et al*., 2009).

Limitation

- Sample size was too small.
- BMI and the TUGT performance was not evaluated.
- KL Grading distribution and the TUGT performance according to different grades of KL was not done.

Future Scope

- Bigger sample size can be taken
- BMI and TUGT performance can be compared and analyzed
- TUGT performance according to different KL Grading can be compared and analyzed

Funding Source: No funding source was give

Conflicts of Interest: There were no conflicts of interest

Conclusion

Participant with knee joint osteoarthritis takes more time to complete the TUGT than participant without knee osteoarthritis. BMI in participant with OA was higher than in participant without OA. Higher KL Grading value also leads to more time to complete TUGT.

List of Abbreviation

KL Grading- Kellgren-Lawrence Grading
Knee OA- Knee Osteoarthritis
TUGT- Time Up and Go Test

REFERENCES

Amano T, Tanaka S, Ito H, Morikawa S, Uchida S. 2018. Quantifying walking ability in Japanese patients with knee osteoarthritis: Standard values derived from a multicenter study. *Journal of Orthopaedic Science*. Nov 1;23(6):1027-31.

Batsis JA, Zbehlik AJ, Pidgeon D, Bartels SJ. 2015. Dynapenic obesity and the effect on long-term physical function and quality of life: data from the osteoarthritis initiative. *BMC geriatrics*. Dec;15(1):118.

Bette R. Bonder, Vanina Dal Bello-Has. Functional performance in older adults. Third Edition.

Davis HC, Blue MN, Hirsch KR, Luc-Harkey BA, Anderson KC, Smith-Ryan AE, Pietrosimone B. 2019. Body Composition Is Associated With Physical Performance in Individuals With Knee Osteoarthritis. Journal of clinical rheumatology: practical reports on rheumatic & musculoskeletal diseases.

Davison MJ, Ioannidis G, Maly MR, Adachi JD, Beattie KA. 2016. Intermittent and constant pain and physical function or performance in men and women with knee osteoarthritis: data from the osteoarthritis initiative. *Clinical rheumatology*. Feb 1;35(2):371-9.

Heidari B. 2011. Knee osteoarthritis prevalence, risk factors, pathogenesis and features: Part I. Caspian journal of internal medicine. 2(2):205.

Orimo H, Ito H, Suzuki T, Araki A, Hosoi T, Sawabe M. 2006. Reviewing the definition of "elderly". Geriatrics & gerontology international. Sep;6(3):149-58.

Osaki M, Tomita M, Abe Y, Ye Z, Honda S, Yoshida S, Shindo H, Aoyagi K. 2012. Physical performance and knee osteoarthritis among community-dwelling women in Japan: the Hizen-Oshima Study, cross-sectional study. *Rheumatology international.* Aug 1;32(8):2245-9.

Ponvel P, Singh DK, Shan SM, Kamsan SS, Ahmad MA. 2019. Comparison of Physical Performance between Older Adult Fallers with and without Knee Osteoarthritis. Jurnal Sains Kesihatan Malaysia (Malaysian Journal of Health Sciences). Jun 27;17(2).

Samson MM, Meeuwsen IB, Crowe A, Dessens JA, Duursma SA, Verhaar HJ. 2000. Relationships between physical performance measures, age, height and body weight in healthy adults. Age and ageing. May 1;29(3):235-42.

Shumway-Cook A, Brauer S, Woollacott M. 2000. Predicting the probability for falls in community-dwelling older adults using the Timed Up & Go Test. Physical therapy. Sep 1;80(9):896-903.

Singh S, Bajorek B. 2014. Defining 'elderly'in clinical practice guidelines for pharmacotherapy. Pharmacy practice. Oct;12(4).

Thomas SG, Pagura SM, Kennedy D. 2003. Physical activity and its relationship to physical performance in patients with end stage knee osteoarthritis. *Journal of Orthopaedic& Sports Physical Therapy.* Dec;33(12):745-54.

Veronese N, Trevisan C, De Rui M, Bolzetta F, Maggi S, Zambon S, Musacchio E, Sartori L, Perissinotto E, Crepaldi G, Manzato E. 2016. Association of Osteoarthritis with Increased Risk of cardiovascular diseases in the elderly: findings from the Progetto Veneto Anziano study cohort. *Arthritis & rheumatology*. May;68(5):1136-44.

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