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Sarita Shevatekar
MPT student, Department, Dr.
APJ Abdul Kalam COPT,
PIMS, Loni, Maharashtra,
India.

Dr. Deepali Hande
Associate Professor,
Department, Dr. APJ Abdul
Kalam COPT, PIMS, Loni,
Maharashtra, India.

Dr. Nupoor Kulkarni
Assistant Professor
Community Physiotherapy
Department, Dr. APJ Abdul
Kalam COPT, PIMS, Loni,
Maharashtra, India

Correspondence
Sarita Shevatekar
MPT student, Department, Dr.
APJ Abdul Kalam COPT,
PIMS, Loni, Maharashtra,
India.

Index of severity of knee osteoarthritis of elderly females in rural area

Sarita Shevatekar, Dr. Deepali Hande and Dr. Nupoor Kulkarni

Abstract

Background: Aging in humans refers to a multidimensional process of physical, psychological, and social change. Ageing is an important part of all human societies reflecting the biological changes that occur, but also reflecting cultural and societal conventions. Prevalence of Osteoarthritis increases with age due to simple wear and tear of the joints. It is more commonly seen in females than in males.

Objective: The objective of the present study was to find out age wise severity of OA Knee in elderly females and to compare the level of severity of OA knee in obese and non obese participants.

Method: Prospective Questionnaire based observational study consists of thirty female participants age ranging from 60-85 years were selected as per inclusion and exclusion criteria. Severity of OA knee was evaluated by using Lequesne *et al* scale. The values were recorded according to Lequesne *et al* Scale and the data was analyzed and interpreted.

Result: Mean score of OA knee according to age group as per grading of Lequesne *et al* scale showed that severity was higher in participants with increased age group. Also, severity of OA knee was higher in obese participants than compared with non-obese participants.

Conclusion: Level of severity of OA is higher in obese people than in non obese people of the same age.

Keywords: Knee Osteoarthritis, Elderly females, Lequesne scale

1. Introduction

Aging in humans it refers to a multidimensional process of physical, psychological, and social change. Gradual change which occurs in an organism leads to increased risk of weakness, disease and death. It takes place in a cell, an organ, or the total organism over the entire adult life span of any living thing, some dimensions of ageing grow and expand over time, while others decline. Research shows that even late in life, potential exists for physical, mental, and social growth and development. Ageing is an important part of all human societies reflecting the biological changes that occur, but also reflecting cultural and societal conventions [1].

Osteoarthritis is a disease which affects the joints in the body. The surface of the joint is damaged and the surrounding bone grows thicker. 'Osteo' means bone and arthritis means joint damage and swelling (inflammation). When joints are swollen and damaged they can be painful. They can also be difficult to move [2].

Osteoarthritis is a slow process that develops over many years. In most cases there are only small changes which affect only part of the joint. New tissues, such as the bony spurs (osteophytes), are produced to try to repair the damage. Unfortunately, in osteoarthritis of the knee the repair does not usually work. Osteoarthritis may then seriously affect the joint, making it painful and difficult to move [2, 3]

Osteoarthritis is a major cause of disability in elderly population around the globe. The prevalence of OA is increasing and will continue to do so as the population increases, ages, and is subject to risk factors such as the obesity epidemic. Around the world, an estimated 10%-15% of adults over 60 have some degree of osteoarthritis. The prevalence of knee osteoarthritis in rural geriatric population is estimated to be 22 to 39% in India. The Prevalence of Osteoarthritis increases with age due to simple wear and tear of the joints. It is more commonly seen in females than in males [4].

Physiological changes occur with aging in all organ systems osteoporosis is frequently seen due to a linear decline in bone mass after the fourth decade.

The epidermis of the skin atrophies with age and due to changes in collagen and elastin the skin loses its tone and elasticity. Lean body mass declines with age and this is primarily due to loss and atrophy of muscle cells [5].

Degenerative changes occur in many joints and this, combined with the loss of muscle mass, inhibits elderly patient's locomotion. These changes with age have important practical implications for the clinical management of elderly patients: metabolism is altered, changes in response to commonly used drugs make different drug dosages necessary and there is need for rational preventive programs of diet and exercise in an effort to delay or reverse some of these changes. The majorly degenerative changes occurring in knee osteoarthritis are joint becomes swollen, cartilage becomes thin, soft and cracked, exposing the bone beneath and leading to the formation of small cysts and new outgrowths of bone called 'osteophytes'. Reduction in the joint space is also one of the major change occurring in knee OA [5-7].

In severe osteoarthritis the cartilage can become so thin that it no longer covers the thickened bone ends. The bone ends touch, rub against each other, and start to degenerate. The loss of cartilage, the wearing of bone and the bony overgrowth at the edges all combine to change the shape of the joint. This forces the bones out of their normal positions and causes deformity [7].

Clinical features for osteoarthritis are pain which starts on activity after a period of rest, but later it becomes worse and cramp like, and comes after activity. A coarse crepitus may be complained by some patients. Swelling of joint is usually a late feature, and is due to the effusion caused by inflammation of the synovial tissues. Stiffness is initially due to pain and muscle spasm, capsular contracture and incongruity of the joint surface contribute to it [7, 8].

As age increases severity of OA increases. Due to increase in age functional disability also increases which further reduces Quality of life. Due to pain physical activities are reduced and due to inability to perform any activity and sedentary lifestyle rate of obesity is increased, which can further lead to OA knee.

Various tools for assessment of osteoarthritis are Lequesne, WOMAC, KOOS, from which the Lequesne Questionnaire is well recognized for its good validity, reliability and responsiveness. Lequesne in 1997 published a scale with the help of which we can find out the severity of Osteoarthritis in Knee joint. The scale is based on daily activities of the patients and scoring is done according to their performance and the pain they experience while doing the activities [9-11]. Functional disability and severity of OA Knee was evaluated by this scale. Hence, the objective of the study is to find out severity of osteoarthritis in knee joint in elderly females.

2. Materials and Methods

a) The research design used for this study is Prospective Questionnaire based observational study. The 30 participants were recruited according to inclusion and exclusion criteria. Inclusion criteria for this study were participants with age group between 60-85 years, those willing to participate in the study, participants with diagnosed cases of knee OA by orthopaedic surgeon and obese and non-obese females. The exclusion criteria for the study were participants with any limb length limb length discrepancies or neuromuscular

disorders of lower extremities, previous knee surgery, recent trauma to the knee and Hip or ankle pathologies. The female participants with OA knee were explained the purpose of study and the written informed consent form were signed by them. The values were recorded according to Lequesne *et al* Scale and the data was analyzed and interpreted.

Outcome measure: lequesne scale

At initial assessment, the self-reporting Lequesne questionnaire was given to all participants and completed on site. The questionnaire was comprised of 11 items asking about difficulty performing a variety of everyday activities. Each item is scored by the subject as 0 (none), 1-4 (mild), 5-7 (moderate), 8-10 (severe), 11-13 (verysevere), ≥ 14 (extremely severe). Lequesne score vary from 0 (low) to 24 (normal function). Total score is out of 24. The scale has high test retest reliability and appears to be moderately responsive to clinical change in patients with osteoarthritis. The scale takes 3-5 minutes to complete by the patient and 30 sec to score by the health practitioner. The Lequesne can be used to evaluate the severity of Osteoarthritis Knee of a patient with a disorder of one or both lower extremity.

The participants were screened from Out Patient Department of community Physiotherapy, Pravara Rural Hospital, Loni and after finding their suitability according to the inclusion and exclusion criteria, they were requested to participate in the study. The participants were briefed about the nature of study and the duration of the study. They were encouraged to clarify queries regarding the study, if any. The demographic data was obtained and a detailed assessment of 30 participants was done on the basis of age, weight. According to inclusion criteria the participants were taken into the study.

Severity of Knee OA was measured with the help of Lequesne *et al* scale. Lequesne scale

Procedure

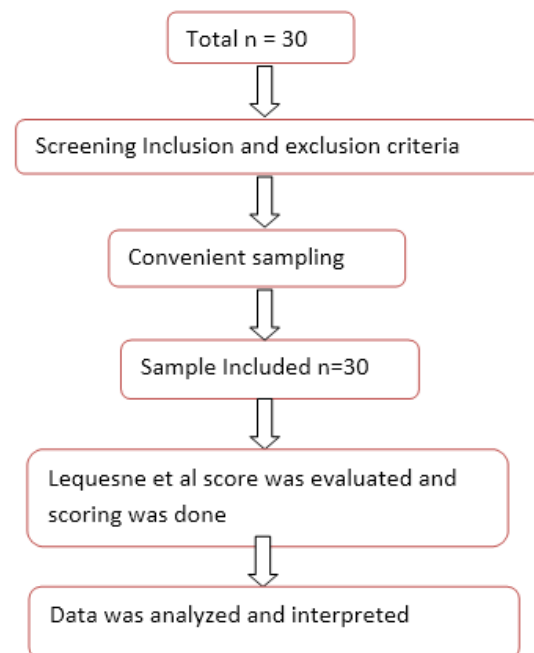


Fig 1: Flow chart representing the procedure of selection of participants

3. Data analysis and results: Assessment of the results: With the help of the Lequesne *et al* scale scoring was done.

Data analysis: Statistical analysis was performed on the data obtained from 30 patients. Data was analyzed using Graph Pad Instat Trial Version 13.3. Descriptive statistics for the outcome measure were expressed as

Table 1: Shows No. of obese and non obese participants.

	No. of patients	Percentage
Non Obese	10	33.33
Obese	20	66.66
Total	30	100

Table 1: Shows out of 30 subjects 33% are Non-obese and 67% are obese who are diagnosed with OA knee.

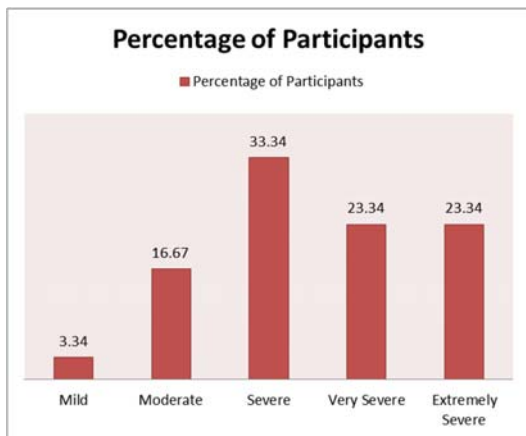


Fig 2: Showing percentage of participants according to severity.

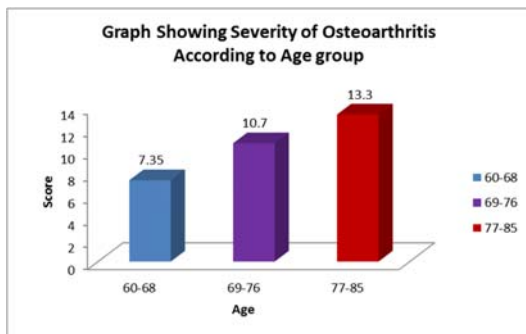


Fig 3: Graph showing severity of Osteoarthritis according to age, the mean score of OA Knee at 60-68 years is 7.35 (moderate), at 69-76 years is 10.7 (severe), at 77-85 years is 13.3 (very severe).

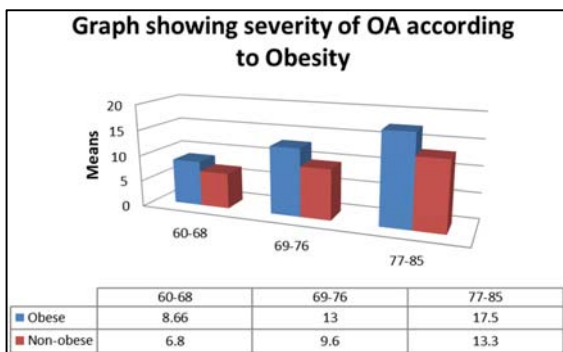


Fig 4: Graph shows the age wise severity of OA knee in obese and non-obese participants.

4. Discussion

Knee osteoarthritis is a prevalent condition contributing significantly to functional limitation and disability. OA is due to pain, decreased muscle strength, instability and stiffness [12]. In present study only female participants were included because the incidence of OA is higher in female than in males because after menopause there are many hormonal changes which lead to changes in bone minerals density and also the joints [2].

The result of present study showed that out of 30 subjects 33% are non-obese and 67% are obese who were diagnosed with OA knee.

The result of the present study showed that among 30 participants percentage of participants according to severity was 3.34% (Mild), 16.67% (Moderate), 33.34% (Severe), 23.34% (Very Severe), 23.34% (Extremely severe). According to results most of the participants were having severe degree of disability according to Lequesne scale.

The result also showed that severity of Osteoarthritis according to age, the mean score of OA Knee at 60-68 years was 7.35 (moderate), at 69-76 years was 10.7 (severe), at 77-85 years it was 13.3 (very severe). Statistical analysis of severity of OA shows that as age advances the severity of OA also goes on increasing. There is co-relation between age and osteoarthritis. As age advances there are degenerative changes seen in the joint also bone mineral density decreases and the bones becomes weak. The blood supply to the joint also decreases therefore repair does not take place. As degenerative changes progress the joint space goes on reducing and osteophytes also increases in number. There can also be fusion of the articulating bones and the patient is not able to walk [4, 5].

The result of present study showed that the mean score of OA knee in obese participants at 77-85 years is 17.5 (extremely severe), at 69-76 years is 13 (very severe) and at 60-68 years is 8.6 (severe). Whereas the mean score in non-obese participants at 77-85 years is 13.3 (moderate), at 69-76 years is 9.6 (severe), at 60-68 years is 6.8. In obese people OA is more severe because due to weight of body there are compressive forces acting on the knee joint, during weight bearing position. This leads to more damage of the articular cartilage and more friction between the articulating bones. Therefore OA is more severe in obese people than in non-obese people [5-7]. In non obese people there are different reasons for the severity of OA knee. They might be due to degenerative changes.

From the previous study we concluded that the prevalence of osteoarthritis is more in female than male due to the hormonal changes occurring after menopause. The prevalence is even higher in geriatric population due to increasing degenerative changes in the joints. Obesity is a precipitating factor of osteoarthritis knee due to excessive weight causing compressive forces acting on knee joint [8, 9].

5. Conclusion

This study concluded that amongst obese participants the percentage of severity is 20% who were moderately affected, 25% severely affected, 25% very severely affected and 30% extremely affected. Amongst the non-obese participants the percentage of severity is 10% who were mildly affected, 10% moderately affected, 50% severely affected, 20% very severely affected, and 10% extremely affected. It was also reported that the level of severity in OA is higher in obese people than in non obese people of the

same age. With respect to the age group the percentage of severity in elderly between 60 to 68 years is 24.5% who were moderately affected. In age group between 69 to 76 years 35.6% were severely affected and in age group between 77 to 85 years 44.3% were very severely affected.

5.1 Limitations: In the present study, the Sample size was too small. More parameters could be taken into consideration.

5.2 Recommendation: More detailed study can be done using larger sample size and more parameters. Further study can be done with orthotic support. There were no dropouts that can be strategically improved in future.

6. Acknowledgement

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