ORIGINAL ARTICLE

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IMPACT OF OSTEOARTHRITIS ON FRAILTY AMONG INDIVIDUALS IN COMMUNITY-DWELLERS- A CROSS-SECTIONAL STUDY.

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ABSTRACT:

Background: The relationship between OA and frailty has been demonstrated by several longitudinal studies, showing that these two conditions share important common risk factors and lead to similar consequences, but if and how OA-related pain, in particular, is linked to frailty is unclear.***Aim:*** To study the association of frailty with osteoarthritis in community dwellers. ***Materials and Methods:*** 15 Participants were selected between age group of 40-70 and were assessed. Participants were assessed for osteoarthritis according to Kellgren and Lawrence system of classification, and frailty was assessed using frailty index and scores were obtained after answering questions. ***Results:*** Mean age of participants was 56.93. Mean BMI for participants was 22.2. Out of 15 participants, 8 males and 7 females were present. Speraman rank correlation test was done to find the correlation between two variables .

Conclusion: Results showed that there was a positive correlation between osteoarthritis and frailty.

Key words: Osteoarthritis, Frailty, Kellgren-lawrence system, frailty index, fatigue, gender.

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INTRODUCTION

Biological ageing is a complex process and that it involves that ageing starts with molecular damage, which leads to cell, tissue, and organ dysfunction. Extensive evidence from animal models studies has shown that mitochondria is responsible to specific aspects of the ageing process, including cellular senescence, chronic inflammation, and the age-dependent decline in stem cell activity.[1] Ageing is a complex process of accumulation of molecular, cellular, and organ damage, which leads to loss of function and increased vulnerability to disease and death, the rate and extent which varies among individuals.[1]

Osteoarthritis (OA) is one of the most common chronic diseases in the elderly with an elevated risk of disability due to pain and degenerative changes causing wear and tear. Pain is one of the primary symptoms reported by OA patients, and its assessment along with typical symptoms and radiographic signs, is recommended by the American College of Rheumatology for the diagnosis of the disease.[2]

People with OA associated with pain are at an high risk of experiencing physical inactivity, falls, and disability. The prevalence of OA increases variably with age. Moreover, OA is rarely associated with mortality in the elderly and is considered a physiological condition of ageing. However, the overall impact of OA is similar to or greater than the impact of stroke.[2]

Song et al. reported that older adults with baseline OA had a higher incidence of activities of daily living (ADL) disability compared with those without OA (9.3% vs 4.5%). In a multivariate model, OA is an independent predictor for developing ADL disability and one out of four cases of ADL disability was related to OA. Nevertheless, the relevance of OA becomes more evident when the typical pathways of disability in the frail elderly are examined. [3]

Frailty is a geriatric syndrome characterized by various systemic changes such as reduced homeostatic capacity, body's physiological reserve, comprising sarcopenia, and immune dysfunction. Which leads to disability, mortality, increased risk of fall.[4]

Frailty as a geriatric syndrome that has its pathophysiological substrate in sarcopenia; it involves loss of functionality with reduction in muscle mass and thus reduced strength, and is a prognostic factor for disability. [5]

OA is not purely a mechanical problem. OA leads to pain and so reduced activity leading to inactivity for various events. In addition to age, genetic and nutritional factors are also important; obesity predisposes individuals to OA both for mechanical reasons and through inflammatory or metabolic mechanisms.[6]

The relationship between OA and frailty has been demonstrated by several longitudinal studies, showing that these two conditions share important common risk factors and lead to similar consequences.[7] Nonetheless, few studies have considered the impact of OA-related pain on frailty. Painful symptoms has been associated with depression, poor sleep, and reduced nutritional intake, as well as the worse quality of life and greater frailty and disability risks, but if and how OA-related pain, in particular, is linked to frailty is unclear.[3]

There are many studies evaluating frailty in older adults, but other associated factors are ignored all time, so osteoarthritis was considered and assessed in this study. Aim of the study was to study the association of frailty with knee osteoarthritis in older individuals and the level of frailty in the older individual.

Methodology:

This is a cross-sectional observational study carried out at geriatric home care and hospital setting. 15 participants were selected with purposive sampling. People aged 40-60 years, both male and female were selected. Participants were selected on the basis of MMSE score, with the normal cognitive ability to answer the questions. Participants with neurological disorders, cognitive disorders, any recent joint replacement surgery were excluded from the study as they were not able to walk for a distance. Frailty: It is a clinically recognizable state of increased vulnerability resulting from an aging-associated decline in reserve and function across multiple physiological systems. Institutional Research Ethics Committee approved this study and written consent was obtained from all participants. Participants were assessed for OA according to clinical symptoms, which was then confirmed by x-ray (Kellgren-lawrence grades) and were assessed for frailty using the frailty index.

PROCEDURE:

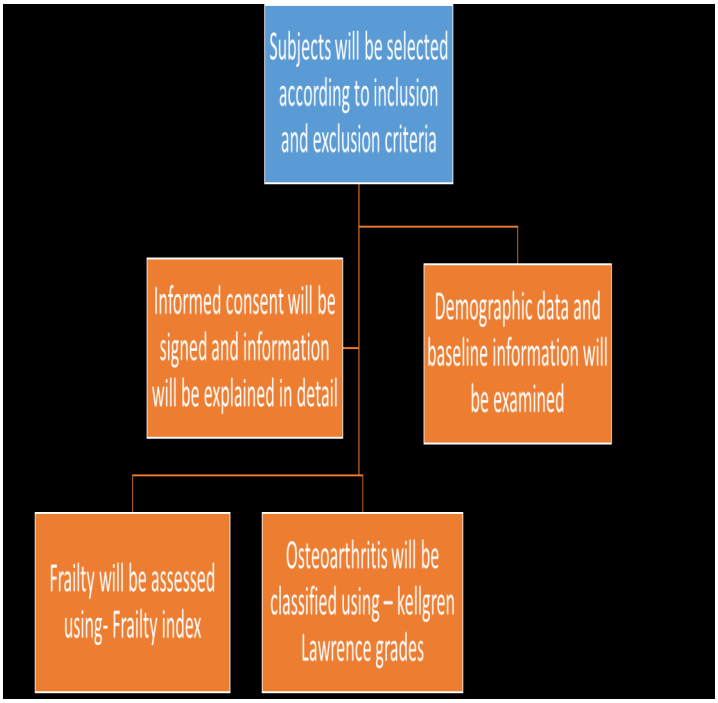

Figure 1: Flow chart explaining procedure.

Testing protocol:

Figure 1 explains the procedure of study and following is the assessment for the same.

Assessment of osteoarthritis :

Examined the participant's medical history and records, previous x-ray reports, and the use of analgesics, and carried out a clinical examination. Knee OA was evaluated by assessing deformity, pain at passive movement, reduced passive mobility, and crepitus. The diagnosis of OA was later confirmed by X-ray using Kellgren-Lawrence classification.

Assessment of Frailty:

Frailty assessment in older community dwellers was done using frailty index which included 10 questions related to health and its perception. Answers to this question included yes or no response. The total score was calculated and accordingly the interpretation was done. It is an assessment done to assess frailty level. The frailty index for elders using items collected in the dataset. FIFE is a 10-item assessment instrument with scores ranging from 0-10.

Interpretation for frailty scale:

Presence of score >4: frailty,

1-3: frailty risk, 0: no frailty.

STATISTICAL ANALYSIS:

Analysis will be done in Microsoft Excel 2010. Descriptive analysis, spearman rank correlation coefficient test will be used for assessing association between frailty and osteoarthritis in healthy older individuals.

RESULTS

The statistical test was done in instat application. The descriptive analysis of the data collected was performed. The spearman rank correlation test was used to assess the differences between the frailty and osteoarthritis for variables. Figure 2 describes the association of frailty in osteoarthritis in both genders.

Patients were evaluated and then divided into two groups as male and female (8-males and 7-females). Spearman rank correlation for 15 subjects showed r=0.5731, two-tailed p=0.0255 considered as significant. Statistics for male subjects showed r=0.7463, two-tailed p=0.036 considered as significant.

Statistic calculation for female subjects showed r=0.8199, two-tailed p=0.0341considered as significant.

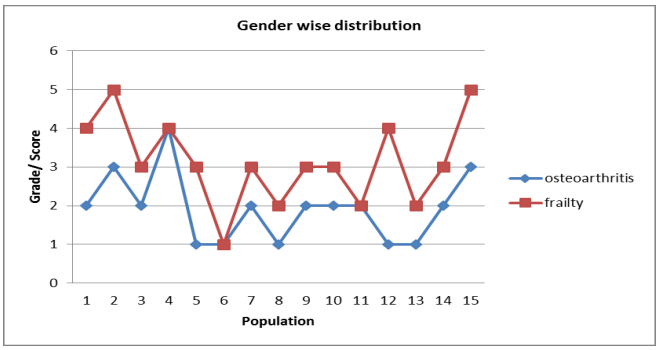

Figure 2: Score for frailty in male and female subjects, Grade of osteoarthritis in Male and female subjects.

DISCUSSION:

Study shows that there is an association between two variables, osteoarthritis and frailty.

Statistical Spearman Rank Correlation test was done, showing r= 0.5402 with a 95% confidence interval. Two-tailed p -value is 0.0376, considered as significant. With the initial manifestation of frailty, weakness is the most common first sign, and occurrence slowness and low physical activity preceded exhaustion and so weight loss. The decline in strength attributed to the loss of muscle mass and muscle quality referred to as sarcopenia, occurring due to anatomic and biochemical changes in aging muscle.

Frailty is preceded by behavioral adaptation occurring in response to declining physiologic reserve and capacity to meet environmental challenges, intra individual challenges. A study was done by Divya Misra et al. on finding an association between frailty and knee osteoarthritis in older adults, 2012 found that from 7822 participants, 213 were prevalent frail subjects. Prevalence of frailty was high in those with radiographic knee OA, symptomatic OA, and increases with x-ray severity, and the number of knee involved.

Study was done by Maria victoria castell et al., to find the association between OA and frailty in elderly population of six European cohorts, in longitudinal study 65-85 years showed overall prevalence of clinical OA was 30.4 % (95 % CI:28.6-32.2); frailty was present in 10.2 % (95 % CI:9.0-11.4) and pre-frailty in 51.0 % (95 % CI:49.0-53.0). Results interpreted that Clinical OA is associated with frailty and pre-frailty in older adults in European countries. Rita de Cássia Corrêa Miguel, conducted a study on frailty syndrome in the community-dwelling elderly with osteoarthritis, The final sample comprised 58 elderly (mean age, 74 ± 5.5 years) as follows: 17 (29.31%) non-frail, 28 (48.28%) pre-frail, and 13 (22.41%) frail. The frail elderly received more medications than the non-frail ones (7.00 ± 2.00 and 4.00 ± 2.00, respectively; P = 0.001). which is similar to this study.

CONCLUSION

This study concludes that as age progresses the level of frailty also increases, but age is not the single factor responsible for it, there are various associated factors for frailty. Likewise, osteoarthritis is one factor responsible for the progression of individuals to frailty. As osteoarthritis progresses, the level of frailty in individuals also increases.

REFERENCES

1. Lo GH, McAlindon TE, Hawker GA, Driban JB, Price LL, Song J, Eaton CB, Hochberg MC, Jackson RD, Kwoh CK, Nevitt MC. Symptom assessment in knee osteoarthritis needs to account for physical activity level. Arthritis & Rheumatology. 2015 Nov;67(11):2897-904.
2. Salehi-Abari I. 2016 ACR Revised Criteria for Early Diagnosis of Giant Cell (Temporal) Arteritis. Autoimmune Dis Ther Approaches. 2016;3:1.
3. Schiphof D, Kerkhof HJ, Damen J, de Klerk BM, Hofman A, Koes BW, van Meurs JB, Bierma-Zeinstra SM. Factors for pain in patients with different grades of knee osteoarthritis. Arthritis care & research. 2013 May;65 (5):695-702.
4. Kohn MD, Sassoon AA, Fernando ND. Classifications in brief: Kellgren-Lawrence classification of osteoarthritis.
5. Veronese N, Maggi S, Trevisan C, Noale M, De Rui M, Bolzetta F, Zambon S, Musacchio E, Sartori L, Perissinotto E, Stubbs B. Pain increases the risk of developing frailty in older adults with osteoarthritis. Pain medicine. 2016 Aug 5;18(3):414-27.
6. Castell MV, Van Der Pas S, Otero A, Siviero P, Dennison E, Denkinger M, Pedersen N, Sanchez-Martinez M, Queipo R, Van Schoor N, Zambon S. Osteoarthritis and frailty in elderly individuals across six European countries: results from the European Project on OSteoArthritis (EPOSA). BMC musculoskeletal disorders. 2015 Dec;16(1):359.
7. Meessen JM, Leichtenberg CS, Tilbury C, Kaptein BL, Koster LA, Slagboom PE, Verdegaal SH, Onstenk R, van der Linden-van HM, Kaptijn H, Vehmeijer SB. Frailty in end-stage hip or knee osteoarthritis: validation of the Groningen Frailty Indicator (GFI) questionnaire. Rheumatology international. 2018 May 1;38(5):917-24.

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