

Prevalence of Kinesiophobia in Patients with Osteoarthritis Knee: A Cross Sectional Study

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ABSTRACT

Background: Osteoarthritis (OA) is one of the commonest forms of joint disease, and the knee is one of the most commonly affected joints. OA is clinically associated with pain, joint stiffness, joint deformity and swelling. Kinesiophobia is a condition in which a patient has an excessive, irritational, and debilitating fear of physical movement and activity resulting from a feeling of vulnerability to painful injury or reinjury. This study addresses the influence of biological (eg: X-ray changes) as well as severity of pain, kinesiophobia in individual physical functioning. The purpose of the study aims to know the prevalence of kinesiophobia in patients with OA knee.

Methodology: A simple random sampling of 30 patients with diagnosed OA knee who visited Pravara Rural hospital (Loni) was included. The patients included were between the age group of 40 - 80 years and were screened according to inclusion and exclusion criteria. The data collection includes the application of scales (Tampa scale of Kinesiophobia-11) which includes 11 items, WOMAC (3 components), VAS to all the 30 subjects and was taken by the principal investigator. The total scores of each scale were analyzed mean and standard deviation were taken. Pearson correlation test was performed to know the correlation between each component.

Result: Pearson correlation test was performed which showed a positive correlation between all the four variables i.e. stage of OA, VAS, TSK 11, WOMAC with $r = 0.0312$.

Conclusion: The present study concluded that as there is progression in level or stage of OA there is increase in severity of pain which leads to further increase in level of kinesiophobia in individuals with OA of knee. This all components furthers leads to decrease in physical functioning in individuals with OA knee.

KEY WORDS: Osteoarthritis, knee, Kinesiophobia, TSK11, WOMAC, VAS.

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INTRODUCTION

Musculoskeletal disorders are considered one of the important public health problems. Osteoarthritis (OA) is the most prevalent musculoskeletal disorders of humans. Osteoarthritis is one of the commonest forms of joint

disease, and the knee is one of the most commonly affected joints. In India it is encountered as prevalence of around 28.7%. Osteoarthritis of the knee is a chronic progressive disorder, which is characterized joint pain and stiffness [1]. It is defined as “a group of

overlapping distinct diseases which may have different etiologies but with similar biologic, morphologic and clinical outcome [2]. The term osteoarthritis defines a condition that results in a structural and functional failure of synovial joints and occurs when the failure of the tissues within the joint are overwhelmed causing progressive cartilage loss, bony remodeling (osteophyte formation), capsular restriction and generalized muscle weakness (Felson, 2006) [3]. The clinical symptoms of OA which include joint stiffness, pain, joint deformity, and swelling (Altman et al., 1986) and the few contributing factors to the development and progression being age, obesity, previous joint injury, genetics and abnormal mechanics (Felson et al., 2000) [1]. This disease in knee joint can limit activities such as stair ascend or descend, rising from sitting, and walking, leading to dependency in activities of daily living.[3] The pathological changes in the joint and the level of pain directly relates to the level of physical functioning.

According to the pathological changes in the joint structures they are classified into 5 stages of OA by Kellgren- Lawrence to know the severity of the osteoarthritis. This classification was proposed by Kellgren et al in 1957 and was accepted by WHO in 1961. Grade 0- No radiographic features are present, Grade 1- doubtful joint space narrowing and osteophytic liping, Grade 2- definite osteophytes and possible joint space narrowing, Grade 3- multiple osteophytes, definite joint space narrowing, sclerosis and possible bony deformity, Grade 4- Large osteophytes, marked joint space narrowing, severe sclerosis, definite bony deformity [1].

Pain is the important component as it is described as a major symptom of OA. It is dull or aching type of pain and it is a variable type of feature. At the initial stages of the disease pain is present only on activity. It may occur after prolonged exercises after bed rest or in bed when limb becomes warm. Later the patient experiences a constant or pain at rest also. OA patients experience some of the typical neuropathic pain symptoms such as burning, tingling, and some of the sensory abnormalities such as hyperalgesia and

allodynia. Currently, the underlying mechanism of OA-related pain may be considered as peripheral and central sensitization. When peripheral joint nociceptors continuously stimulate pain during mechanical and inflammatory processes there is increased peripheral sensitivity and altered central pain modulation in the central nervous system (CNS) may result which may be causing effects on sensitization of the spinal nerves and an increased reaction to environmental stimuli [4]. The intensity of pain, physical and structural impairment only partly predict the level of (daily) functioning. Psychological factor plays an important role in the development, maintenance and exacerbation of chronic disability of musculoskeletal disorders [5]. The factors associated with the presence of pain is self-limitation /fear of activities which are perceived to cause or increase pain.

There are different terms used for describing pain related fear. Kori, miller and Todd subsequently applied the ideas about fear avoidance to chronic pain and physical movement, with the introduction to the term "Kinesiophobia"[9]. Kinesiophobia is a condition in which a patient has an excessive, irritational, and debilitating fear of physical movement and activity resulting from a feeling of vulnerability to painful injury or reinjury [10]. There are different terms used for describing pain related fear. Kori, miller and Todd subsequently applied the ideas about fear avoidance to chronic pain and physical movement, with the introduction to the term "Kinesiophobia"[6].

Kinesiophobia is a condition in which a patient has an excessive, irritational, and debilitating fear of physical movement and activity resulting from a feeling of vulnerability to painful injury or reinjury [7].

Fear of movement or Kinesiophobia has been studied in number of conditions such as chronic low back pain, chronic fatigue syndrome, shoulder pain and even in elderly population to know the level of kinesiophobia which affects the patient daily physical activity. This term is used in rehabilitation medicine and physiotherapy to describe the patients pain due to movement. Kinesiophobia

can be acquired through two forms: a direct aversive experience (e.g. Pain or trauma) or social learning (observation and instruction) [8]. To assess the fear of movement or fear of pain related activities several questionnaires were developed Pain Anxiety Symptoms Scale (McCracken et al., 1992), the Fear-Avoidance Beliefs Questionnaire (Waddell et al., 1993) and the Tampa Scale of Kinesiophobia (TSK; (Miller et al., 1991; Vlaeyen et al., 1995)). But Tampa scale of kinesiophobia is considered one of the ideal scale for assessing the fear of movement or kinesiophobia [6]. TSK 11 is considered to be the recent version containing 11 components. TSK-11 has a valid and reliable psychometric measure and a high degree of internal consistency. It is four-point Likert scale with total score of 44. Higher the score severe is the kinesiophobia is considered. Kinesiophobia and pain is directly related physical functioning. To know the level of physical functioning several scales are there for example KOOS scale, WOMAC scale. The most commonly used scale for assessment is WOMAC scale. The Western Ontario McMaster's Universities Osteoarthritis (WOMAC) index was used to assess clinical parameters and functional levels.

Several studies where done to raise the question about the role of kinesiophobia in patients with OA. This study addresses the influence of biological (eg:X-ray changes) as well as severity of pain, kinesiophobia in individual physical functioning. To reach a better understanding of pain-related fear in OA patients this study will be performed. The purpose of the study has twofold. First, the study had tried an attempt to examine the factor structure of the TSK in OA patients by means of confirmatory factor analysis. Second, the role of pain-related fear in OA disability will be investigated. The main research question was to examine the degree to which pain-related fear measured with the TSK-11, compared to other factors, such as radiological findings and level of pain intensity, influences daily functioning in OA patients [5].

METHODOLOGY

Participants: The study was a cross sectional type of study design, there was a comparison

of kinesiophobia with pathological changes of osteoarthritis (OA) knee and functional status. The population consisted of 45 OA knee patients were screened visiting Pravara rural hospital. All the participants were under the age group of 40 to 80 years. Both male and females were included in the study. All the participants were diagnosed cases of OA knee by the physician with proper X- ray findings. Patients with Pain severity of 3 to 7 on visual analog scale (VAS) and stage 2, 3, 4 of OA knee according to Kellgren and Lawrence classification were included in the study. Exclusion criteria are: stage 1 OA, rheumatoid arthritis, ankylosing spondylitis and gout. The 45 patients were screened from which 15 were excluded in which 5 patients were having rheumatoid arthritis, 2 were not willing, 3 were the patients of gout, 5 patients were not having recent radiograph of knee joint. All the patients were informed about the protocol and written informed consent was taken.

Measures

Radiographs: Recent radiographs of bilateral knee were taken and grading was done according to Kellgren and Lawrence classification. The grading ranges from grade 0 to grade 4. As grade 0 and grade 1 were excluded from the study.

Pain severity: Severity of pain was assessed by visual analog scale (VAS). The visual analog scale as 10 rating which is rated by the patient. The patient is asked to mark on the scale according to the severity. 1,2,3,4 is considered as mild, 5,6,7 is considered as moderate, and 8, 9,10 is considered as severe pain.

Kinesiophobia: The english version of Tampa scale of kinesiophobia version 11 to assess the level of kinesiophobia. TSK 11 there are 11 components i.e. 11 questions. TSK 11 is considered to be the recent version containing 11 components. TSK-11 has a valid and reliable psychometric measure and a high degree of internal consistency. It is four-point Likert scale with total score of 44. Higher the score severe is the kinesiophobia is considered.

Physical functioning: The Western Ontario

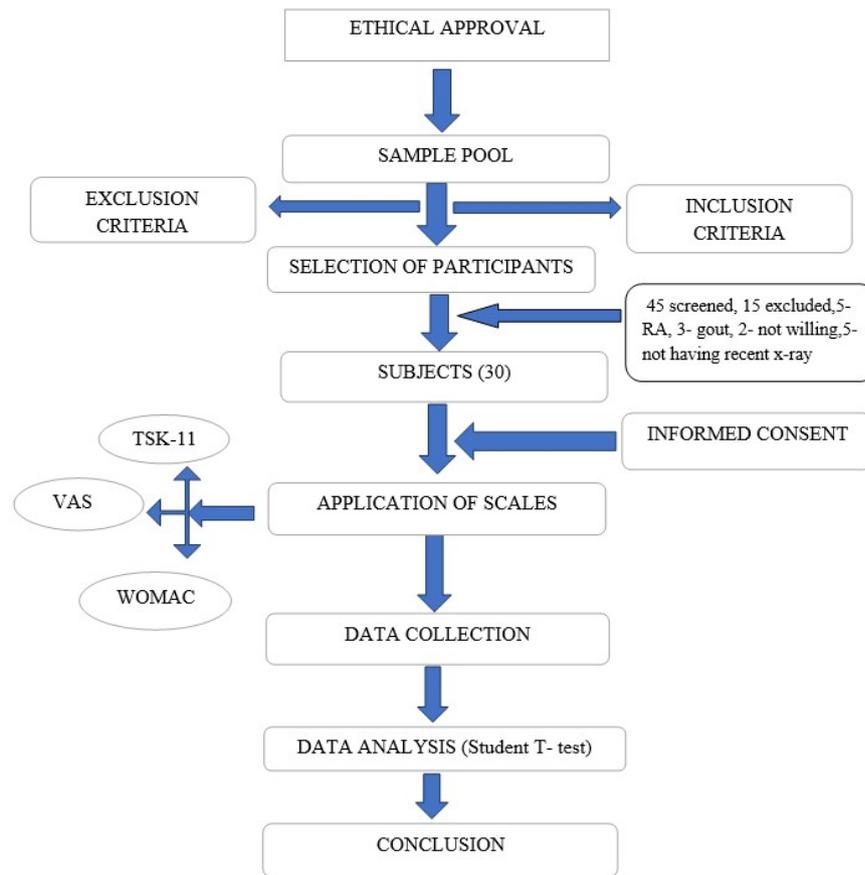


Fig. 1: Showing the Procedure flow chart.

McMaster’s Universities Osteoarthritis (WOMAC) index was used to assess clinical parameters and functional levels. This measure is three dimensional (pain, stiffness and physical function. The index consists of pain (5 items), stiffness (2 items), physical function (17 items), social function (7 items), and emotional function (10 items) subscales. All of the items in these subscales are rated on a 5-point scale (1: none, 2: slight, 3: moderate, 4: very, 5: extremely).

Procedure: An informed consent was taken from every subject before participation in complete study. The data collection was done by the application of scales (Tampa scale of Kinesiophobia-11) which includes 11 items, WOMAC (3 components), VAS to all the 30 subjects from rural population in Ioni visiting Pravara rural hospital. The assessment of scales were taken by the principal investigator. Procedure is explained in figure no 1.

RESULTS

The sum of total score to TSK11 and WOMAC scale of each patient was calculated.

The mean and standard deviation of in all score of stage of OA, VAS scale, TSK11 and WOMAC scale was taken. It is shown in table no 1.

Pearson correlation test was done to know the correlation between all the four variables.

Pearson correlation test measures the strength of linear association between the variables and which is denoted by value r. A r value can range from +1 to -1 or 0.

Pearson correlation test showed a positive correlation between all the four variables, with the r value 0.0312. (Table no 2)

This signifies that if there is a progression of stage of OA which eventually leads to increase in pain severity, increase in level of kinesiophobia, increase in WOMAC score (which will signifies decrease in physical function).

Hence progression in stage of OA, increase in severity of pain, increase in level of kinesiophobia which eventually decreases the level of physical function.

Table 1: Mean and standard deviation (SD) of variables.

Variables	Mean	SD
Stage of OA	3.17	0.76
VAS	5.87	1.04
TSK 11 scale	29.54	2.99
WOMAC scale	58.06	12.53

Table 2: Pearson correlation value.

Variables	Mean	SD	r value	Significance
Stage of OA	3.17	0.76	r= 0.0312	Positive correlation
VAS	5.87	1.04		
TSK 11	29.54	2.99		
WOMAC	58.06	12.53		

DISCUSSION

The present study evaluated the influence of kinesiophobia on physical functioning in individuals with OA knee. For that purpose TAMPA scale of kinesiophobia (TSK 11) was used which was correlated with the WOMAC (Western Ontario McMaster’s Universities Osteoarthritis) scale for physical functioning was evaluated. Not only with the physical functioning, Kinesiophobia was also correlated with current stage of OA and severity of pain. Kinesiophobia is defined as specific fear of injury or reinjury. The stage of OA was classified according to Kellgren and Lawrence classification via radiological findings. The severity of pain was evaluated by VAS (Visual analog scale). All these factors were correlated with each other to know how these factors affect each other and which has negative effects on physical functioning as well as the patient undergoing rehabilitation.

Kinesiophobia has been studied in diverse patient populations (e.g., chronic low back pain, chronic fatigue syndrome) and has been associated with increased pain, physical disability, and psychological disability. Few experimental data suggest that pain-related fear of movement and avoidance or kinesiophobia can be acquired through associative learning. In patients with osteoarthritis (OA), maintaining a sufficient level of daily activity is critical to managing pain and disability associated with the disease, but individuals who experience kinesiophobia may be hesitant to initiate or engage in daily activity [9]. Research findings suggest that cognitive, affective, and behavioural factors

play a role in the aetiology and persistence of chronic pain [13]. In this study 30 participants with diagnosed OA knee and recent knee radiology were included in the study. Pearson correlation test was done between all the four variables which showed a positive correlation between all the four variables with r value 0.0312. This signifies that as there is increase in stage of OA, severity of pain and increase in level of kinesiophobia there is decrease in physical functioning. Increase in degenerative changes, pain and fear of injury or reinjury which reduces the level of physical functioning.

Some of the studies hypothesized that the sensory and emotional component of pain may lead to a fear of pain that may contribute to the development of chronic musculoskeletal pain syndromes such as neck pain, fibromyalgia syndrome, even in postoperative total knee arthroplasty. The complex interaction between the physiologic factors (sensation of pain) and psychologic factors (emotional reaction to pain) may lead to a maladaptive response in which the perception of pain becomes exaggerated. Individuals with OA knee physical therapy is important to regain strength, range of motion, and improvement in physical activity. Patient with kinesiophobia as difficulty in undergoing physical therapy or rehabilitation. Any exercise that cause pain on movement, the individual with kinesiophobia reduces the efforts of doing the exercise. That is why it is important to evaluate the degree of kinesiophobia in relation with pain, stage of OA, and physical function before getting the patient for physical therapy or rehabilitation. Therefore it appears relevant and important to study the role of kinesiophobia in OA knee patient further and investigate treatment strategies to reduce this fear. This may be helpful in adopting a active and healthy lifestyle in individuals with OA knee [3,10].

CONCLUSION

The present study concluded that as there is progression in level or stage of OA there is increase in severity of pain which leads to further increase in level of kinesiophobia in

individuals with OA of knee. This all components further leads to decrease in physical functioning in individuals with OA knee. This can lead to disability, poor quality of life, reduction in exercise tolerance and making individual dependent. Measuring the level of kinesiophobia is an important part of assessment for better outcome of rehabilitation.

ABBREVIATIONS

OA- Osteoarthritis.

TSK 11- Tampa scale of kinesiophobia version 11.

WOMAC- Western Ontario McMaster's universities osteoarthritis

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Conflicts of interest: None

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