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A PROSPECTIVE STUDY OF PREVALENCE OF NEUROPATHIC PAIN IN PATIENTS WITH KNEE OA

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ABSTRACT

Background: Pain in knee osteoarthritis (OA) is generally inflammatory (nociceptive), but may also have a neuropathic component. The mechanisms of neuropathic pain (NP) and OA pain, although different, are both defined as chronic pain, and combinations are possible.
Objective: To evaluate the prevalence of neuropathic pain in patients with knee OA using the painDETECT questionnaire.
Methods: 140 patients with knee OA were enrolled and NP was assessed by painDETECT. Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) was used to assess pain, stiffness, and physical function.
Results: Mean age was 61.2 years. On assessment by painDETECT, 10 (7.14%) were classified as likely NP, 38 (27.14%) as possible NP, and 92 (65.72%) as unlikely NP. painDETECT scores, when correlated with WOMAC score revealed a strong correlation with WOMAC stiffness and WOMAC pain score.
Conclusions: The importance of NP in the management of knee OA cannot be overlooked.

Introduction

Osteoarthritis (OA), a chronic multifactorial degenerative disease characterized by progressive loss of articular cartilage causing subchondral sclerosis and joint deterioration, is the most common cause of arthritis in the general population in India.[1] The knee joint is most commonly involved. Pain in OA has been attributed to local tissue injury causing 'nociceptive pain'.[2] However, cumulative data suggest that both neuropathic and nociceptive mechanisms may contribute to the OA pain.[3-5]

Chronic pain can be categorized as inflammatory or neuropathic. Inflammatory pain, found inn conditions such as rheumatoid arthritis, is the result of sustained stimulation of nociceptors. In contrast, neuropathic pain is the result of damage to or dysfunction of, nerves. Principal causes include diabetes, cervical or lumbar radiculopathies, and spinal cord injury.[6,7]

According to the International Association for the Study of Pain (IASP), neuropathic pain is a "clinical syndrome with varied etiology arising as a consequence of a lesion or disease affecting neurosensory system.[8] Diagnosis depends on a good history, clinical neurological examination, and sensory testing. IASP also recommends screening tools to differentiate neuropathic pain from nonneuropathic pain. Although, there are several tools to assess neuropathic pain[9], Pain DETECT does not require a clinical examination, and shows a slightly higher sensitivity and specificity in comparison with the other tools.[10] Hence, for our study, we selected painDETECT for this advantage.

Although knee OA is very commonly seen in the elderly population, causing functional morbidity and extreme pain, there is scarcity of literature regarding the prevalence of neuropathic pain in knee OA. Hence, we conducted this prospective study.

Materials and Methods

We performed this prospective study in the Orthopaedics outpatient department (OPD) of Netaji Subhash Chandra Bose Medical College, Jabalpur (M. P.). Patients with knee OA (age >50 years) satisfying the American College of Rheumatology (ACR) 1986 classification criteria for primary knee OA[11] were included in the study. Exclusion Criteria were patients with OA secondary to diseases such as infection, trauma or rheumatoid arthritis or history of any type of surgery in and around the knee.

Study Procedure

Patients with knee OA (as defined by ACR criteria) were enrolled in the study. Clinical examination included measurement of height, weight, the presence or absence of joint line tenderness, swelling, effusion, bony hypertrophy/enlargement and crepitus.

The Western Ontario and McMaster Universities Osteoarthritis (WOMAC) Index was used to assess pain, stiffness, and physical functional ability in the knees.[12]

Although, there are several tools recommended by the IASP to assess neuropathic pain[9], we selected Pain DETECT, as it does not require a clinical examination, and shows a slightly higher sensitivity and specificity in comparison with the other tools.[10] PainDETECT is a patient-based questionnaire consisting of seven weighted sensory descriptor items and two items relating to the spatial (radiating) and temporal characteristics of the patient's pain pattern. The painDETECT score was distributed from 0 to 38 (Table 1). Patients were divided into three groups: neuropathic pain is likely (score ≥19), possible (score ≥13 to ≤18), and unlikely (score ≤12).

Results

We studied 140 patients with knee OA, in which 52 were males and 88 female. The mean age of the patients was 61.2 years. Table 2 shows the demographic characteristics of the patients.

Within the study population, 10 (7.14%) were classified as likely NP, 38 (27.14%) as possible NP, and 92 (65.72%) as unlikely NP. painDETECT scores, when correlated with WOMAC score revealed a strong correlation with WOMAC stiffness and WOMAC pain score.

Discussion

OA has a high prevalence in the elderly population and is a major cause of disability. It is recognized that the cause of pain in OA may not arise only from the joint, but may be contributed by a neuropathic component because of central sensitization.[13-16] Generally, the origin of OA pain has been considered to be nociceptive, but our study identified 7.14% of our patients as likely to have NP and 27.14% as possibly having NP. painDETECT scores, when correlated with WOMAC score revealed a strong correlation with WOMAC stiffness and WOMAC pain score.

Some authors have reported that joint pain arises mainly from free nerve endings that exists in the capsule or in the synovium,[17-19] whereas others have reported innervation of the osteochondral junction in human knee OA samples and indicated a possible contribution of the subchondral area to OA knee pain.[20,21] Regarding the mechanism of NP in knee OA, it is highly possible that NP occurs in association with damage to nerves innervating subchondral bone because of its weight-bearing surface in late stage OA, In early phase, synovitis produces joint fluid and stimulates free nerve endings in synovium. On the other hand, a decrease in the amount of joint fluid and destruction of the

osteochondral junction may induce injury to the nerve endings in this area in late phases of OA.

Another mechanism has been postulated for NP in OA. Approximately 60-80% of OA patients achieve pain relief after local anesthetic treatment or surgical replacement of the affected joint, indicating peripheral mechanisms driving the pain, although central mechanisms are also thought to play a role in some patients and dysfunction of diffuse noxious inhibitory controls has been described.[22-24] These central mechanisms may overlap with those in other pain states such as neuropathy.

A large community based study from Spain showed that 52% (1125/2167) patients with painful knee OA had neuropathic pain.[25] When patients with potential confounders were excluded, the prevalence of neuropathic pain reduced to 33%. In this Spanish study, authors used the DN4 questionnaire to diagnose neuropathic pain. Another community based study from Canada found that 28% (48/171) patients with knee OA had neuropathic pain.[26] In the Canadian study, the authors modified the painDETECT questionnaire to enquire about neuropathic pain. A recent Japanese study concluded from painDETECT scores for pain from knee OA to be 5.4% likely NP and 15.2% possibly NP.[26] Another recent study from the UK used the painDETECT and Leeds assessment of neuropathic symptoms and signs scale form to enquire about neuropathic pain and found neuropathic pain in 27% of 179 respondents.[16] A very recent cross-sectional study from southern India revealed a very high prevalence (49%) of neuropathic pain, as assessed by DN4 questionnaire, in patients with knee OA.[27] Our study identified 7.14% of our patients as likely to have NP and 27.14% as possibly having NP.

There are several limitations of this study. The reliability of painDETECT for NP in knee OA has not been fully evaluated; therefore, further study is needed to clarify this.

Conclusion

The painDETECT scores for pain from knee OA revealed that 7.14% are likely to have NP, and 27.14% are possibly having NP. The importance of NP in the management of knee OA cannot be overlooked.

Table 1 painDETECT Questionnaire

Item	Score
*Gradation of pain**	
• Do you suffer from a burning sensation (e.g. stinging nettles) in the marked areas?	0–5
• Do you have a tingling or prickling sensation in the area of your pain (like crawling ants or electrical tingling)?	0–5
• Is light touching (clothing, a blanket) in this area painful?	0–5
• Do you have sudden pain attacks in the area of your pain, like electric shocks?	0–5
• Is cold or heat (bath water) in this area occasionally painful?	0–5
• Do you suffer from a sensation of numbness in the areas that you marked?	0–5
• Does slight pressure in this area, e.g. with a finger, trigger pain?	0–5
Pain course pattern	
Please select the picture that best describes the course of your pain:	
Persistent pain with slight fluctuations	0
Persistent pain with pain attacks	−1
Pain attacks without pain between them	+1
Pain attacks with pain between them	+1
Radiating pain	
Does your pain radiate to other regions of your body? Yes/No	+2/0

Table 2 Demographic Characteristics

Number of patients	**140**
Sex	Male: 52 (37.14%) Female: 88 (62.86%)
Mean age (range)	61.2 years (50-75)
Duration of knee pain (range)	11.7 months (1-120)
WOMAC Scores 1. WOMAC pain 2. WOMAC stiffness 3. WOMAC physical function 4. WOMAC total	 13.7 5.4 48.6 67.5
painDETECT Score 1. 0-12 2. 13-18 3. 19-38	 92 (65.72%) 38 (27.14%) 10 (7.14%)

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