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PREVALENCE OF BAKERS'S CYST AMONG PATIENTS WITH KNEE OSTEOARTHRITIS IN KASHMIR

Orthopaedics

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ABSTRACT

Introduction: Baker's cyst (BC) represents a bursa between the gastrocnemius and semimembranosus tendons which is communicating with the knee joint synovial covering that typically appears as swelling in the popliteal fossa. The aim of this study was to estimate the prevalence of Baker's cyst among knee osteoarthritic patients in Kashmir valley. **Materials and Methods:** Patients attending the out-patient Department of Orthopaedics, Govt. Bone and Joints Hospital, Barzulla Srinagar an associated Hospital of Govt. Medical College Srinagar from June 2019 to January 2020. A total of 52 patients with knee osteoarthritis were enrolled in this study. These patients were complaining of chronic knee pain, inadequately controlled by systemic or local pharmacotherapy. All patients underwent ultrasonographic examinations of both knee joints for the investigation of Baker's cysts and among 52 patients, the prevalence of Bakers cyst was found in 17 patients. **Results:** Among 52 patients with knee osteoarthritis, Bakers Cyst was found in 17 patients by ultrasound procedure with a prevalence of 32.69 %. The prevalence of Bakers Cyst markedly increased with the duration of osteoarthritis. The Bakers cyst was more prevalent among patients with severe obesity and there is a significant relation between Bakers cyst and obesity grades. The higher prevalence of Bakers Cyst was common among patients with severe hyaline cartilage degeneration and more prevalent among patients with large effusions. **Conclusion:** Baker's cysts are a common ultrasonographic finding in knees with chronic osteoarthritis. The factors significantly associated with presence of baker cyst were; increase in the duration of osteoarthritis, presence of severe obesity, severe femoral hyaline cartilage degeneration, and large effusion.

KEYWORDS

Prevalence; Baker Cyst; Knee Osteoarthritis; Ultrasonographic Study

INTRODUCTION

Knee osteoarthritis is the most prevalent type of arthritis, a common disease in aged adults. Osteoarthritis of knee is the most common worldwide degenerative joint disease. Pain is the most common clinical presentation of KOA, which typically exacerbates by mechanical movements and usually relieved by rest [1]. Away from Pain which is the chief complain in KOA, the development of functional decline, physical functional limitation and disability represents the major challenge in the management of KOA [2].

Baker's cyst (BC) is a buildup of fluid in the bursa between the tendons of the gastrocnemius and semimembranous muscles, which often communicates with the joint space. Its development is therefore associated with the passage of joint fluid, and may occur in various diseases, especially when there is joint effusion [3, 4]. Although clinical symptoms may include pain and swelling, especially during maximum flexion or extension of the knee and may also be asymptomatic and pass undetected during clinical examination. Detection is important because rupture of an undiagnosed cyst may cause acute inflammation and loss of function that is difficult to distinguish from thrombophlebitis, which calls for quite different treatment [3, 4].

It may be detected incidentally in the general population but is more frequently found in patients suffering from knee osteoarthritis (KOA) [5-10]. In these patients the prevalence ranges from 20% to 40%, and increases with age, severity of OA, and duration of disease [11-17]. This figure is not surprising given that in almost 30–50% of cases a connection is present between the knee articular space and the Gastrocnemio semimembranosus bursa. The communication channel is a 15–20 mm transverse slit-like capsular opening adjacent to the proximal postero-lateral margin of the medial femoral condyle [18-20]. There is a valve effect between the bursa and the joint, due to the action of the semitendinosus and gastrocnemius muscles. During flexion the valve opens and the synovial fluid under pressure moves into the bursa; during extension the valve closes due to the tension of these muscles and the fluid remains trapped inside the bursa. In normal conditions the amount of fluid is small and can be easily reabsorbed; on the contrary, in OA (mainly in activated knee osteoarthritis) the amount of fluid is increased and this causes the filling and the formation of popliteal cysts [19, 20]. However, roughly 50% of BCs do not communicate with the knee joint; therefore, other mechanisms may be involved. Bursal enlargement and inflammation could be the result of the same factors involved in the pathogenesis of KOA (e.g., multiple micro-traumas due to an excessive loading on the joint, sporting activity, impaired joint stability, meniscal tears, chondromalacia, valgus deformity and others) [6, 15, 16]. Several symptoms (e.g., pain, swelling, stiffness, loss of flexibility) are common both to KOA and BC. The location of pain and swelling may be diagnostic, but sometimes it may be difficult to evaluate the exact cause of symptoms. So, it is debated whether and to what extent each condition contributes to the patient's discomfort. In the current study, we estimate the prevalence of Baker's cyst among knee osteoarthritic patients.

MATERIALS AND METHODS

Patients attending the out-patient Department of Orthopaedics, Govt. Bone and Joints Hospital, Barzulla Srinagar an associated Hospital of Govt. Medical College Srinagar from June 2019 to January 2020. A total of 52 patients with knee osteoarthritis were enrolled in this study. These patients were complaining of chronic knee pain, inadequately controlled by systemic or local pharmacotherapy. All patients underwent ultrasonographic examinations of both knee joints for the investigation of Baker's cysts and among 52 patients, the prevalence of Bakers cyst was found in 17 patients.

Inclusion criteria:

- Both female and male patients
- Aged >18
- Radologically confirmed of Bakers Cyst

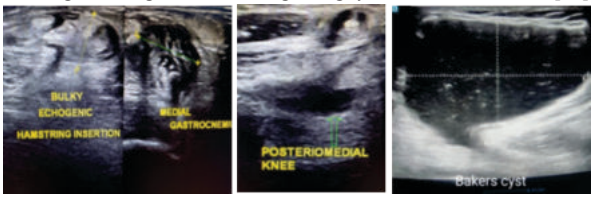
Exclusion criteria:

- Age <18 years
- Patients affected by rheumatoid arthritis or other inflammatory conditions
- Patients with history of joint surgery or recent trauma

A knee-orientated history was taken and knee discomfort was graded using a 3-point scale: 0, no pain; 1, pain only at stress limiting daily activities (walking, climbing, weight-lifting); 2, pain at stress and rest

(also including nocturnal pain). The range of motion of the knees was measured from full extension to maximum flexion using a goniometer.

All subjects underwent plain radiography of the knees. Radiographic severity of the disease was classified according to the standard radiological Kellgren–Lawrence grading system for osteoarthritis [21]



A B C

Figure 1: Ultrasonography

RESULTS

The mean age of the enrolled population in this study was 51.7 (range 42-69) years. The current study included 52 patients with knee osteoarthritis, among which Bakers Cyst was found in 17 patients by ultrasound procedure with a prevalence of 32.69 %.

In this study the average duration of onset of osteoarthritis was 3.90 (range 1-8) years. The prevalence of Bakers Cyst markedly increased with the duration of osteoarthritis. The prevalence of Bakers Cyst reported was 11 (64.71 %) in patients with duration of onset of osteoarthritis ≥5 years and 6 (35.29 %) in patients with < 5 years (Table 1).

The Bakers cyst was more prevalent among patients with severe obesity and there is a significant relation between Bakers cyst and obesity grades (Table 1).

Baker cyst was commonly prevalent in the left knee 11 (64.71%) than in the right 6 (35.29 %) table 1. The prevalence of Bakers Cyst among patients with severe hyaline cartilage degeneration was in 8 (47.06 %) patients, with moderate hyaline cartilage degeneration was in 6 (35.29 %) patients and with mild hyaline cartilage degeneration was in 3 (17.65 %) patients. The higher prevalence of Bakers Cyst was common among patients with severe hyaline cartilage degeneration (Figure 2).

The findings revealed that there was significant relation between knee effusion and presence of Bakers Cyst and more prevalent among patients with large effusions. Bakers Cyst was significantly higher in patients with large effusion 9 (52.94 %) compared to 5 (29.41 %) and 3 (17.65 %) among those with moderate and mild effusions respectively (Figure 3).

Table 1: Patients demography

Parameters		No. of patients	Percentage
Gender	Male	36	69.23
	Female	16	30.77
Prevalence of Bakers Cyst among enrolled patients		17	32.69
Prevalent side	Right	11	64.71
	Left	6	35.29
	Bilateral	2	11.76
Duration OF Osteoarthritis	<5 years	6	35.29
	≥5 years	11	64.71
Weight	Normal	2	11.76
	Over weight	2	11.76
	Mild obesity	4	23.53
	Moderate obesity	3	17.65
	Severe obesity	6	35.29

DISCUSSION

Knee osteoarthritis (KOA) is the most frequent form of arthritis affecting the knee with subsequent significant impact on patient functional ability. Knee osteoarthritis (KOA) also represent the most frequent knee disorder that linked to baker cyst (BC) and the increased pain and disability with the presence of baker cyst in such cases necessitates looking for the frequency of baker cyst and possible risk factors associated with its development [22-25]. Among all these widely different results they all represent baker cyst as a common problem in knee osteoarthritis.

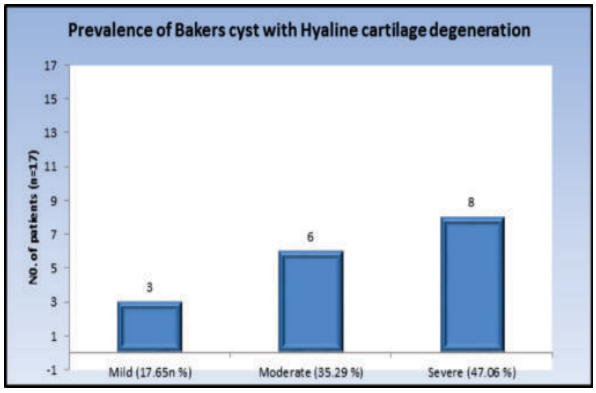


Figure 2: Prevalence of Bakers cyst with hyaline cartilage degeneration

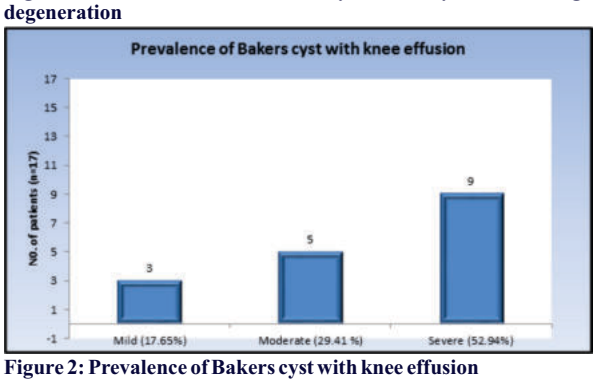


Figure 2: Prevalence of Bakers cyst with knee effusion

In the current study, we looked for the prevalence of baker cyst among 52 Kashmiri patients with established diagnosis of knee osteoarthritis, using ultrasound as useful significant tool for defining the baker cyst. According to our results prevalence of baker cyst was 32.69%, among enrolled patients with knee osteoarthritis. Our results represent baker cyst as a common problem that is associated with knee osteoarthritis. This finding is supported by Naredo., et al., Fem., et al., Chiou., et al., and Dimitrios., et al. as they reported a common presence of baker cyst in knee osteoarthritis, and in the other hands we all agreed about the usefulness of ultrasound in the diagnosis and detection of baker cyst [26-29].

More in depth finding of ultrasound assessment of knee osteoarthritis, is the hyaline femoral cartilage (HFC) which considered as a representative for the degree of knee osteoarthritis. Our results shows hyaline femoral cartilage as an important factor for the development of baker cyst, as higher prevalence of baker cyst 47.06% were encountered among patients with severe hyaline femoral cartilage loss in comparison to moderate and mild hyaline femoral cartilage loss, were baker cyst was 35.29% and 17.65% respectively. So according to our results the severity of knee osteoarthritis is associated with higher frequencies of baker cyst development, which is supported by Bevers., et al. as they reported a positive relation between baker cyst and the degree and symptoms of knee osteoarthritis [30].

Knee effusion has been Longley presumed as the cause of baker cyst by its positive effect on intra artciular pressure with subsequent posterior diffusion of the synovial fluid in to the potential space of baker cyst [31-34]. In the current study knee effusion was found with positive association between its presence and the baker cyst in both sides. Furthermore, large effusions were more associated higher frequencies of baker cyst than mild and moderate effusions. Similar association also reported by Naredo., et al and Chiou., et al. which support our results [26, 27].

Away from the ultrasound parameters obesity and disease duration were a risk factors significantly associated with baker cyst occurrence, which can be explained by the disease progression as both usually associated with more progressive disease, and obesity associated with increased intra articular pressure which can predispose to posterior diffusion of synovial fluid to baker cyst, in agreement with others [35, 36]. The limitation of our study includes the lack of comparison of ultrasound results to standard magnetic resonance imaging (MRI) for diagnostic accuracy of ultrasound, but for these large number of

patients the use of MRI will be very expensive, plus the multiple recent growing evidence for validity and reliability of ultrasound for detection of baker cyst, with comparable sensitivity to MRI can excuse this limitation [37].

CONCLUSION

Baker's cysts are a common ultrasonographic finding in knees with chronic osteoarthritis. The factors significantly associated with presence of baker cyst were; increase in the duration of osteoarthritis, presence of severe obesity, severe femoral hyaline cartilage degeneration, and large effusion.

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