

## Original Research Article

# Frequency of pes anserine bursitis in patients with knee osteoarthritis

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## ABSTRACT

**Background:** Knee pain is a very common disease in the elderly, which is often attributed to osteoarthritis but pes anserine bursitis also can cause knee pain, especially in OA patients. The aim of this study was to determine the frequency of pes anserine bursitis in patients with knee osteoarthritis.

**Methods:** This cross-sectional descriptive study included 245 patients with definitive knee osteoarthritis referred to Imam Khomeini Hospital in Ardabil city from September 2020 to December 2021. All patients were sent to ultrasonography to diagnosis Pes Anserine Bursitis. Osteoarthritis was divided into 4 groups based on the radiographic classification of Kellgren-Lawrence. The severity of knee pain was also determined by the Visual Analogue Scale (VAS). The necessary data were collected by a checklist and then analysed by statistical methods in SPSS version 22.

**Results:** Total 175 out of 245 patients (71%) were diagnosed with pes anserine bursitis. There was a significant relationship between age, gender, BMI, OA and staging of OA with the risk of anserine bursitis.

**Conclusions:** Results showed that the high prevalence of anserine bursitis in patients studied indicates the importance of this issue and the need for attention by physician as one of knee pain reasons. Since the clinical examination has a significant diagnostic power in the detection of anserine bursitis, it is recommended that special attention be paid to the clinical examination. Attention to the risk factors in the country such as obesity, the use of toilets and so on, which can be controlled and can be prevented.

**Keywords:** Knee pain, Osteoarthritis, Pes anserine bursitis

## INTRODUCTION

Knee pain is a very common disease in the elderly, which is often attributed to osteoarthritis of the knee, but posterior anserine bursitis can also cause knee pain, which is often ignored by doctors in clinics.<sup>1,2</sup> In osteoarthritis, local destruction of articular cartilage is the main manifestation of pathology at the tissue level. Knee osteoarthritis causes more disability and clinical symptoms than other joints, and according to the available evidence, it is considered a major health problem worldwide, so that this disease is the most important cause of chronic disability in developed

countries.<sup>3,4</sup> In general, the prevalence of knee osteoarthritis in people over 65 years old is reported to be about 35%.<sup>5</sup> In a study conducted in 2008 on 10,291 people from the population of Tehran, Iran, the frequency of knee osteoarthritis was reported as 15.3%.<sup>6</sup> Osteoarthritis is more common before the age of 45 in men and after the age of 55 in women, and its frequency increases with age in both sexes. Age is the strongest risk factor for this disease. Other risk factors of this disease include obesity, type of job, metabolic diseases, trauma, continuous use of stairs, not using the toilet, and overall lifestyle.<sup>7</sup>

The main symptoms of osteoarthritis of the knee are pain, morning dryness, limitation of joint movements and tenderness in the joint line.<sup>8</sup> Pes Anserine bursitis is a knee problem in which the fluid-filled bursa at the common junction of the three hamstring muscles becomes inflamed and causes pain. This complication is not a problem that occurs suddenly but occurs gradually and can cause pain and suffering to the patient and is responsible for limiting individual functions. This condition is known as "post-anserine bursitis" or "anserine bursitis".<sup>9</sup> Patients with anserine bursitis may complain of dull pain on the inside of the knee or may have swelling and tenderness along the proximal medial aspect of the tibia. Symptoms may worsen when going up and down stairs. Conditions associated with anserine bursitis usually include degenerative knee joint disease, obesity, knee valgus deformity, posterior planus, and sports activities and lifestyle issues such as continuous use of stairs and not using the toilet, etc.<sup>9-14</sup> Although osteoarthritis is considered to be the main cause of knee pain in most cases, but in some patients with knee pain complaints, anserine bursitis may also exist together with knee osteoarthritis, which may be anserine bursitis caused knee pain. The treatment methods of these two are different from each other.<sup>15,16</sup> Attributing the pain to osteoarthritis in these patients can lead to invasive interventions such as intra-articular injection or joint replacement without reducing the amount of knee pain, while the correct diagnosis of anserine bursitis as the cause of knee pain and its treatment with things like ultrasound or local corticosteroid injections often significantly reduce knee pain.

Therefore, the correct management of patients with knee pain requires diagnosing its main cause and considering anserine bursitis as one of the causes that has received less attention, and then using appropriate treatment modalities to reduce pain and restore patients' performance. Anserine bursitis has been known for years, but not much attention has been paid to anserine bursitis as a cause of knee pain, and there is conflicting information about its frequency, such that its frequency in England is 2.5%, 7.2% in Korea, 20% in Turkey, and 46% in another study in Korea.<sup>17-20</sup>

There are no exact statistics available about its frequency in Iran. In most of the previous studies, clinical examination or MRI has been used as a diagnostic method, while anserine bursitis is easily diagnosed using a detailed clinical examination and, if necessary, ultrasound confirmation, which is a cheaper method and also is more accessible.<sup>19</sup>

The aim of this study is to determine the frequency of pes anserine bursitis in osteoarthritis patients who referred to the rheumatology clinic of Imam Khomeini Hospital and Royan Subspecialty Clinic with complaints of knee pain.

## METHODS

### *Study design and participant*

This cross-sectional descriptive study was conducted on 245 patients with osteoarthritis who had referred to the clinic of Imam Khomeini Hospital (RA) and Royan Subspecialty Clinic with complaints of knee pain from Sep 2020 to Dec 2021. Considering the frequency of 20% of anserine bursitis in patients with osteoarthritis in past studies, and considering the type 1 error of 5 percent and accuracy of 5 percent, the sample size was estimated about 245 people.<sup>19</sup> Osteoarthritis patients with complaints of knee pain were included in the study, and patients with a history of rheumatology such as rheumatoid arthritis, seronegative spondyloarthropathies, systemic lupus erythematosus, or connective tissue diseases, a history of malignancy, patients with a history of stroke or a history of neuromuscular or neurological diseases, arthritis related to infections, patients with a history of trauma to the knee, patients with a complete knee prosthesis, a history of surgery on the knee, and patients with effusion findings in knee examination were excluded from the study.

After receiving informed consent, the patients were sent to ultrasound to diagnose anserine bursitis. Ultrasound was performed by a radiologist who is not aware of the findings of the physical examination and direct radiographs of the knee.

Osteoarthritis patients were divided into 4 groups based on the radiographic classification of K lgren-Lavernke knee (grade 1: small and suspicious osteophyte; grade 2: definitive osteophyte without joint space reduction; grade 3: moderate joint space reduction; grade 4: severe reduction of joint space and subchondral sclerosis).<sup>22</sup> The severity of knee pain was also determined by visual pain assessment scale (VAS). The results were recorded along with the demographic data (sex and age), height, and weight of the patients in the data collection checklists. Body mass index was calculated using the formula of weight in kilograms divided by the square of height in meters. Hemogram, biochemical values, sodium concentration and C-reactive protein were determined and recorded for all patients.

### *Statistical analysis*

The data were presented in the form of tables and graphs using descriptive statistics methods. To compare the two groups in terms of quantitative variables, independent t-test was used and in terms of qualitative variables, chi-square test (and Fisher's exact test if necessary) was used. The analysis was done in the SPSS version 22 environment and considering the significance level to be less than 0.05.

## RESULTS

A 245 patients who were suffering from osteoarthritis and came to the clinic with knee pain were included in the study. After examination and ultrasound confirmation, 175 cases (71.4%) were diagnosed with pes anserine bursitis. 72 people (41.1%) had bursitis on both sides. 28 people (16%) had right bursitis and 75 people (42.8%) had left bursitis. The average age of the entire studied population was 57.15±9.47 years. For comparison, patients were divided into two age groups, larger equal to 50 and smaller than 50. 190 patients were older than 50 years old, of which 148 (77.8%) had anserine bursitis. 55 people were under 50 years old and 27 people (49%) had bursitis. Statistical analysis showed that the rate of bursitis increases significantly in older age. Of these, 3 cases were men and 243 cases were women, which

statistical analysis showed that the percentage of women is higher and gender is an important risk factor. In relation to BMI, the average was 28.35±5.23. Among the people who had a BMI greater than 25, 136 patients were diagnosed with anserine bursitis, and among those with a BMI below 25, 39 patients were diagnosed with anserine bursitis. Chi-Square statistical analysis showed that there was a significant relationship between BMI and the occurrence of anserine bursitis, so that people with a higher BMI are more likely to suffer from anserine bursitis. In order to determine the frequency of anserine bursitis in patients, based on the radiographic classification, the patients were divided into 4 categories, grades 1 to 4, according to the radiology grade. The highest rate of bursitis was observed in grade 4 with the number of 62 people (35.4%) and the lowest rate in grade 1 with the number of 14 people (8%) (Table 1).

**Table 1: Frequency of anserine bursitis in OA patients by variables.**

Variables	Levels	Number of patients	Number of bursitis	Percent	P value
Age (years)	≥50	190	148	77.8	0.03
	<50	55	27	49	
BMI	≥25	163	136	83.4	0.012
	<25	82	39	47.5	
VAS	≥6	130	95	73.07	0.5
	<6	115	80	69.56	
OA Grade	1	31	14	8	0.03
	2	62	40	22.8	
	3	79	59	33.7	
	4	73	62	35.4	

**Table 2: Compare OA patients with and without anserine bursitis by ESR and CRP amounts.**

Group	Mean ESR	SD	P
With bursitis	12.97	7.71	0.9
Without bursitis	11.65	6.22	
Group	Number of CRP+	Percent	P
With bursitis	44	25.1	0.9
Without bursitis	17	24.2	

In order to compare the frequency of anserine bursitis in patients based on the severity of knee pain, pain intensity was measured based on the VAS ruler. Patients were divided into two groups. Anserine bursitis was observed in 73.07% of those who had a VAS score above 6 and 69.56% of those who had a VAS score below 6. Chi-Square statistical analysis did not show a significant relationship. To compare ESR, patients were divided into two groups with bursitis and without bursitis. The mean ESR in patients who did not have bursitis was 11.65±6.22 and in patients who had bursitis was 12.97±7.71. Statistical analysis by T-test method did not show any significant difference in two groups (Table 2). Out of 175 people who had bursitis, 44 people had positive CRP levels. And out of 70 people who did not have anserine

bursitis, 17 people had positive CRP. Chi-Square statistical analysis showed no significant difference in the two groups. In order to determine the diagnostic power of the clinical examination as a side finding, we identified the patients in whom there was a strong clinical suspicion of anserine bursitis in the file, so that after the ultrasound and the diagnosis is confirmed, it is possible to compare the clinical diagnostic power. In the meantime, out of 245 patients, we identified 163 cases in which the suspicion of anserine bursitis was higher. After ultrasound, it was found that 139 of these patients had anserine bursitis. Positive and negative predictive value and sensitivity and specificity for the diagnostic power of clinical examination in order were positive predictive value =85.27%, negative predictive value =56.09%, specificity =65.71%, sensitivity =79.42%, test accuracy =75.51%.

## DISCUSSION

The average age of the entire study population was 57.15±9.47. This average age in the study of Eshen et al was 59.61, in the study by Uysal et al, the age of the patients was 58.9±9 years, and in the study by Kang et al was 60.76 and in the study by Helfenstein et al was 55.6.<sup>15,19-21</sup> It seems that the average referral of

osteoarthritis patients does not have any special dependence on race and geographical location because in almost all studies, the average age was similar in the same category.

Also, a statistically significant relationship was found between age and the occurrence of anserine bursitis, and older patients were more likely to have anserine bursitis. Regarding gender and OA, 98.7% of the patients in the present study were women, which shows a very significant difference between OA and gender. Regarding the frequency of anserine bursitis in the study of Eshen et al, anserine bursitis was observed with a frequency of 20%, which was a significant percentage.<sup>15</sup> This rate was reported as 2.5% in the study of Rennie et al.<sup>17</sup> In the study of Uysal et al, the overall prevalence of anserine bursitis in these patients was 20% (34 cases out of 170 examined knees).<sup>19</sup> In this study, the incidence of bursitis in women were significantly more. In a study in 2000, Kang et al, investigated anserine bursitis in patients with knee osteoarthritis.<sup>20</sup> In this study, 62 patients were examined, of which 29 (46.8%) had anserine bursitis. Among the studies we reviewed, the highest prevalence rate of bursitis in patients was related to Kang et al.'s study, which was reported as 46.8%. A noteworthy point in our study was that 175 people out of 245 people had 71.42% of anserine bursitis, which is almost twice the amount observed even in studies where a high percentage of anserine bursitis was observed in them. The reason for this high prevalence of bursitis is related to risk factors in Iran, such as obesity and people's lifestyle, such as not using the toilet, continuous use of the stairs, sitting on the floor, etc. In relation to gender and bursitis. Anserine Bursitis, in general, in all similar studies, women had a significantly higher frequency in relation to osteoarthritis and also anserine bursitis. This rate was 83% in the study of Eshen et al, 88% in Rennie et al.<sup>15,17</sup> In the study of Uysal et al, 85 patients with osteoarthritis included 11 men and 74 women, and the frequency of women included in the study was 87% of the target population. In our study, only 3 of the patients were men and the rest of the patients were women (98.7%). This high prevalence in Iran is due to the nature of the disease itself, which mostly affects women, and due to the type of the disease. It is life and... that causes illness and going to the doctor. On the other hand, it can be assumed that women pay more attention to pain and are more persistent than men, and symptomatic osteoarthritis is more common in women. And the reason for visiting the clinic is more. Uysal et al, reached a positive conclusion about the existence of a significant relationship between gender and the occurrence of anserine bursitis, and the findings showed that the prevalence of anserine bursitis in women was significantly higher than that of men.

Kong et al, reported that osteoarthritis patients with and without anserine bursitis had no statistically significant differences in terms of age, sex, and disease severity. In other studies, the presence or absence of a significant relationship between gender and the presence of anserine

bursitis was not mentioned. In our study, the incidence rate of women was much higher. In relation to BMI, there was a significant relationship with high BMI and the rate of anserine bursitis ( $p=0.012$ ). Regarding the severity of osteoarthritis and its relationship with the presence of anserine bursitis, in the study of Uysal et al, the degree of osteoarthritis and the prevalence of anserine bursitis increased significantly with increasing age of patients, and there was a significant positive correlation between the degree of osteoarthritis and length and level of anserine bursitis. In our study, more anserine bursitis was observed in people who were older ( $p=0.03$ ). In order to compare the frequency of anserine bursitis in patients based on radiographic classification, we divided the patients into 4 groups. The first group had grade 1 radiographic criteria, the second group had grade 2 radiographic criteria, the third group had radiographic grade 3 criteria, and the fourth group had radiographic grade 4 criteria. The statistical results showed that the rate of anserine bursitis is significantly higher in high grades of osteoarthritis ( $p=0.03$ ). In order to compare the frequency of anserine bursitis in patients based on the severity of knee pain, pain intensity was measured based on the VAS scale. Patients were divided into two groups. The first group had a VAS score greater than 6 and the second group had a VAS score less than 6. The results showed that 73.07% of those with a VAS score above 6 and 69.56% of those with a VAS score below 6 had anserine bursitis. Chi-Square statistical analysis did not show a significant relationship. To compare ESR, patients were divided into two groups with bursitis and without anserine bursitis. The mean ESR in patients who did not have bursitis was  $11.65 \pm 6.22$  and in patients who had bursitis was  $12.97 \pm 7.71$ . Statistical analysis by t-test did not show any significant difference in two groups. In order to compare the relationship between anserine bursitis and CRP rate, patients were divided into two groups with and without anserine bursitis. 175 patients had bursitis and 70 patients had not. Out of 175 people who had bursitis, 44 people had positive CRP levels and out of 75 people who did not have anserine bursitis, 17 people had positive CRP. Chi-Square statistical analysis showed no significant difference in the two groups. Relying on inflammatory factors as well as patient's pain does not seem to be helpful in predicting the presence of anserine bursitis. In the end, what is worthy of consideration is the high percentage of women suffering from OA and of course suffering from anserine bursitis in our study, which was not found in any of the studies that we reviewed, which is news of the difference in lifestyle in Iran. Unfortunately, although anserine bursitis has a relatively high prevalence, especially in our climate, it may be ignored by doctors due to the lack of a detailed examination, while according to our study, a detailed examination has close to 85% sensitivity in diagnosis and this method is very easy and inexpensive. This finding is important because we may not even need to prove it by ultrasound method, and in case of strong suspicion of pes anserine bursitis, we can rely on our own diagnosis with

85% sensitivity. There were very few men included in the study and it was not possible to check some parameters.

This study has some limitations. The number of male in this study in compare with women is less and so the evaluation of some parameters were not applicable for us.

## CONCLUSION

The high prevalence of anserine bursitis in the studied patients indicates the special importance of this issue and the need for doctors to pay attention to it. This rate in this study was 71.4%, which is a significant rate. The accuracy of the examination in this study was almost 85%, which shows the importance of the examination and its diagnostic power, which reduces the need for ultrasound in many cases. A direct relationship between anserine bursitis and BMI was found with a significant level of 0.012. Paying attention to the risk factors in the country such as obesity, not using the toilet, sitting on the floor, using stairs, exercise and unprincipled walking along with extremes are things that can be controlled and the disease can be prevented. There is a significant relationship ( $P= 0.03$ ) between age and suffering from anserine bursitis, as well as the presence of a significant relationship between the degree of osteoarthritis and anserine bursitis ( $P= 0.03$ ) was also seen in this study. No significant relationship was found between the occurrence of anserine bursitis and inflammatory factors such as CRP and ESR. It is suggested to conduct a study with this title in such a way that the patients are divided into two equal groups consisting of men and women so that it is possible to compare the symptoms in men and women in creation anserine bursitis and osteoarthritis.

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## REFERENCES

1. Yusuf E, Kortekaas MC, Watt I, Huizinga TW, Kloppenburg M. Do knee abnormalities visualised on MRI explain knee pain in knee osteoarthritis? A systematic review. *Ann Rheum Dis.* 2011;70(1):60-7.
2. Grover RP, Rakhra KS. Pes Anserine Bursitis. *Bullet NYU Hosp Joint Dis.* 2010;68(1):46-50.
3. Deyle GD, Allison SC, Matekel RL, Ryder MG, Stang JM, Gohdes DD, et al. Physical therapy treatment effectiveness for osteoarthritis of the knee: a randomized comparison of supervised clinical exercise and manual therapy procedures versus a home exercise program. *Phys Ther* 2005;85(12):1301-17.
4. Kenneth D. Brand T. Osteoarthritis. In: Braunwald, et al. *Harrison's principles of internal medicine*, 15th ed. Mc Graw-Hill; 2005:2036-2039.
5. Solomon Louis. Clinical features of osteoarthritis. In: Ruddy Sh, Harris Ed, et al. *Kelly's Textbook of Rheumatology*, 6th ed. Saunders; 2005:1516.
6. Davatchi F, Jamshidi A, Banihashemi A, Gholami J, Forouzanfar M, Akhlaghi M, et al. WHO-ILAR COPCORD study (stage 1, urban study) in Iran. *J Rheumat.* 2008;35(7):1384.
7. Ahadi T, Saleki M, Razi M, Raeisi GH, Forough B. Comparison of physical modality and knee isometric exercise training on symptom of knee osteoarthritis. *J Gorgan Uni Med Sci.* 2011;12(4):12-17.
8. Tavakkoli M, Tavakkoli F. The effect of mobilization on improvement of physical function in knee osteoarthritis. *J Kermanshah Univ Med Sci.* 2010;15(1):13-17.
9. Wood LR, Peat G, Thomas E, Duncan R. The contribution of selected non-articular conditions to knee pain severity and associated disability in older adults. *Osteoarthr Cartil.* 2008;16:647-53.
10. Butcher JD, Salzman KL, Lillegard WA. Lower extremity bursitis. *Ame Fam Physi.* 1996;53(7):2317-24.
11. Imani F, Rahimzadeh P, Gharehdag FA, Faiz SH. Sonoanatomic variation of pes anserine bursa. *Kor J Pain.* 2013;26(3):249-54.
12. Gnanadesigan N, Smith RL. Knee pain: osteoarthritis or anserine bursitis? *J Am Med Dir Assoc* 2003;4(3):164-6.
13. Alvarez-Nemegyei J. Risk factors for pes anserinus tendinitis/bursitis syndrome: a case control study. *J Clin Rheumatol.* 2007;13(2):63-5.
14. Cohen SE, Mahul O, Meir R, Rubinow A. Anserine bursitis and non-insulin dependent diabetes mellitus. *J Rheumatol.* 1997;24(11):2162-5.
15. Eşen S, Akarırnak Ü, Aydın FY, Ünalın H. Clinical evaluation during the acute exacerbation of knee osteoarthritis: the impact of diagnostic ultrasonography. *Rheumatol Inter.* 2013;33(3):711-7.
16. Altman RD. Classification of disease: osteoarthritis. In: *Seminars in arthritis and rheumatism*. 20 Vol. WB Saunders; 1991:40-47.
17. Rennie WJ, Saifuddin A. Pes anserine bursitis: incidence in symptomatic knees and clinical presentation. *Skeletal Radiol.* 2005;34(7):395-8.
18. Yoon HS, Kim SE, Suh YR, Seo YI, Kim HA. Correlation between ultrasonographic findings and the response to corticosteroid injection in pes anserinus tendinobursitis syndrome in knee osteoarthritis patients. *J Kor Med Sci.* 2005;20(1):109-12.
19. Uysal F, Akbal A, Gökmen F, Adam G, Reşorlu M. Prevalence of pes anserine bursitis in symptomatic osteoarthritis patients: an ultrasonographic prospective study. *Clin Rheumatol.* 2015;34(3):529-33.



20. Kang I, Han SW. Anserine bursitis in patients with osteoarthritis of the knee. *South Med J.* 2000;93(2):207-9.
21. Helfenstein Jr M, Kuromoto J. Anserine syndrome. *Revis Brasil Reumatol.* 2010;50(3):s313-27.
22. Thomas J. Schnitzer A (ed). Osteoarthritis. In Goldman, Ausell, Cecil text book of medicine. 22nd ed. Saunders; 2004:170-711.

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