International Journal of Orthopaedics Sciences

E-ISSN: 2395-1958
P-ISSN: 2706-6630
IJOS 2021; 7(4): 855-857

www.orthopaper.com
Received: 19-08-2021
Accepted: 26-09-2021

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Clinical profile of cases of osteonecrosis of the femoral head

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DOI: https://doi.org/10.22271/ortho.2021.v7.i4l.3026

Abstract
Background: Osteonecrosis of the femoral head (ONFH) is a disabling condition of the hip joint that primarily affects the young individuals. The present study was conducted to assess cases of osteonecrosis of the femoral head.
Materials & Methods: 52 cases of osteonecrosis of the femoral head of both genders were enrolled. Anteroposterior and lateral radiographs of the hip joint and magnetic resonance imaging (MRI) was taken.
Results: Age group <20 years had 20 males and 11 females, 20-40 years had 8 males and 6 females and 40-60 years had 4 males and 3 females. The difference was significant ($P< 0.05$). Common aetiology found to be steroids in 12, trauma in 6, alcohol in 10, aplastic anemia in 5, drugs in 4, pregnancy in 7 and idiopathic in 8 cases. The difference was significant ($P< 0.05$). ARCO stage 1 was seen in 7, 2 in 24, 3 in 16 and 4 in 5 cases. The difference was significant ($P< 0.05$).
Conclusion: Steroid administration is most common cause of osteonecrosis of the femoral head.

Keywords: Femoral head, osteonecrosis, steroid

Introduction
Osteonecrosis of the femoral head (ONFH) is a disabling condition of the hip joint that primarily affects the young individuals. The etiology, natural history, and epidemiology of ONFH have not been fully elucidated. There are associations of many diseases and drugs with ONFH [1].
Death of bone cells is the end result of one or more pathogenic mechanisms, acting individually or synergistically, that include ischemia, direct cellular toxicity, and altered differentiation of mesenchymal stem cells. Ischemia may result from vascular disruption, compression, constriction, or intravascular occlusion [2]. Disruption of the vascular network around the femoral head results in traumatic osteonecrosis, thus causing complications in 15% to 50% of displaced femoral neck fractures and 10% to 25% of hip dislocations. Vascular compression may result from intraosseous hypertension secondary to fatty infiltration of the bone marrow following corticosteroid use or alcohol overuse. Vasoconstriction of femoral head epiphyseal arteries may be enhanced by corticosteroids [3]. Intravascular occlusion may result from thrombosis, fat or gas embolization, or sickle cell aggregation. Mont *et al*. [4] believe that ONFH is multifactorial that is associated with genetic predilection and exposure to certain risk factors. These risk factors include chronic corticosteroid administration, chronic alcohol ingestion, smoking, and various chronic diseases (renal disease, hematological disease, inflammatory bowel disease, post-organ transplantation, hypertension, and gout).
ONFH may be asymptomatic in the early stages. Clinically, the most common symptom is a deep pain in the groin. Pain may be referred to the ipsilateral buttock or knee. Symptoms worsen with weight bearing and are relieved with rest. The range of motion becomes limited, particularly hip abduction and internal rotation; logrolling (i.e., passive internal and external rotation) elicits pain [5]. The present study was conducted to assess cases of osteonecrosis of the femoral head.

Materials & Methods
The present study comprised of 52 cases of osteonecrosis of the femoral head of both genders. All were informed regarding purpose of the study and all were convinced for the participation.

Socio- demographic data of all was recorded in case history proforma. A details history, clinical examination, radiological examination and Harris hip score (HHS) were recorded. Anteroposterior and lateral radiographs of the hip joint and magnetic resonance imaging (MRI) was taken. Routine investigations like complete blood count, renal function test, liver function test, lipid profile and coagulation profile were performed for all patients.

Results of the study thus were compiled and entered in MS excel sheet for statistical analysis. P value less than 0.05 was considered significant.

Results

Table 1: Age and gender distribution

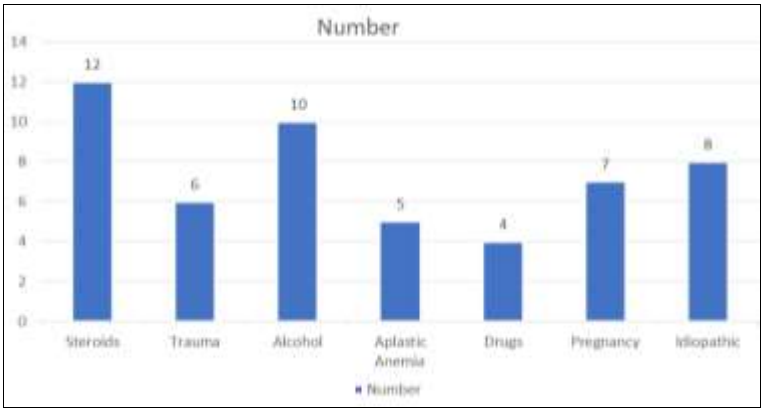
Age group (years)	Male	Female	P value
<20 years	20	11	0.04
20-40	8	6	
40-60	4	3	

Table I shows that age group <20 years had 20 males and 11 females, 20-40 years had 8 males and 6 females and 40-60 years had 4 males and 3 females. The difference was significant ($P< 0.05$).

Table 2: Aetiology of cases

Aetiology	Number	P value
Steroids	12	0.05
Trauma	6	
Alcohol	10	
Aplastic Anemia	5	
Drugs	4	
Pregnancy	7	
Idiopathic	8	

Table II, graph I shows that common aetiology found to be steroids in 12, trauma in 6, alcohol in 10, aplastic anemia in 5, drugs in 4, pregnancy in 7 and idiopathic in 8 cases. The difference was significant ($P< 0.05$).

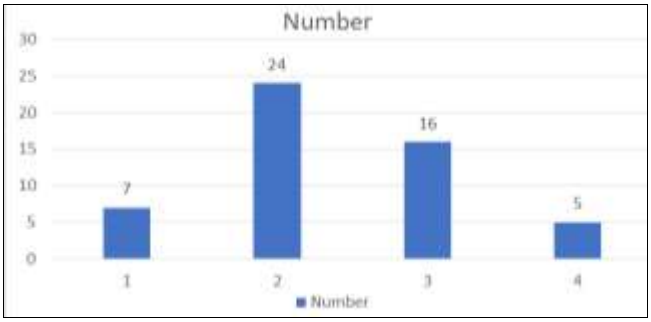


Graph 1: Aetiology of cases

Table 3: ARCO staging

ARCO staging	Number	P value
1	7	0.01
2	24	
3	16	
4	5	

Table III, graph II shows that ARCO stage 1 was seen in 7, 2 in 24, 3 in 16 and 4 in 5 cases. The difference was significant ($P< 0.05$).



Graph 2: ARCO staging

Discussion

Symptomatic femoral head osteonecrosis typically follows a progressive course [6]. Prognostic factors for progression include the extent of the osteonecrosis lesion, location of the lesion within the femoral head, and the presence of bone marrow edema in the proximal femur [7]. Imaging studies and particularly MRI are essential for evaluating these factors; these studies may help assess the risk for femoral head collapse and clarify the natural history of the disease [8]. The extent of the osteonecrosis lesion is a prognostic factor for femoral head collapse; it can be assessed as a proportion of the cross-sectional area of the head or as the combined angle of the necrotic area in midsagittal and midcoronal MRI cuts [9]. The present study was conducted to assess cases of osteonecrosis of the femoral head.

In this study, age group <20 years had 20 males and 11 females, 20-40 years had 8 males and 6 females and 40-60 years had 4 males and 3 females. Vardhan *et al*. [10] in their study 249 patients (382 hips) of osteonecrosis femoral head (ONFH) were evaluated. The mean age was 34.71 years (range 14-70 years) and 70.28% (n=175) patients were between 20 and 40 years. Male to female ratio was 5:1. Bilateral ONFH was observed in 53.41% (n=133) patients. In atraumatic conditions, bilateral involvement was seen in 61.61% (130/211) patients. Steroid administration (37.3%, 93/249) was most commonly observed in the patients followed by idiopathic in 21.3% (53/249) patients, chronic alcohol consumption in 20.1% (50/249) patients, and trauma in 15.3% (38/249) patients. There were 48% (185/382) hips in ARCO Stage 2 followed by 33% (125/382) in Stage 3 and 16% (61/382) in Stage 4. The mean HHS was 80.97 ± 14.35 in unilateral ONFH. The mean HHS was 72.79 ± 14.43 and 80.07 ± 13.52 in more involved hip and in less involved hip, respectively, in bilateral ONFH. The ARCO staging had statistically significant correlation with HHS (Pearson's

correlation coefficient r = −0.783, *P*< 0.01) in unilateral ONFH patients and more severely affected hip in bilateral (Pearson's correlation coefficient r = −0.654, *P*< 0.01) ONFH, but it did not show any association with less involved hip in bilateral cases.

We found that common aetiology found to be steroids in 12, trauma in 6, alcohol in 10, aplastic anemia in 5, drugs in 4, pregnancy in 7 and idiopathic in 8 cases. Ha *et al*. [11] prospectively evaluated 37 hips with precollapse osteonecrosis of the femoral head, of which 23 (62%) were symptomatic. The combined necrotic angle was determined on MRI using a modified Kerboul method and hips were randomly assigned to either nonsurgical management or core decompression. Patient follow-up continued until collapse or for a minimum of 5 years when no collapse occurred. None of the 4 hips with a combined necrotic angle of ≤190° collapsed; 4 of the 8 hips with a combined necrotic angle of between 190° and 240° collapsed; and all 25 hips with a combined necrotic angle of >240° collapsed. No difference was noted between untreated hips and hips undergoing core decompression.

We observed that ARCO stage 1 was seen in 7, 2 in 24, 3 in 16 and 4 in 5 cases. Yoo *et al*. [12] reported that, at a mean follow-up of 13.9 years, 13 of 124 hips (11%) failed and underwent THA. No difference in hip survival was observed between Ficat-Arlet stage II and III hips. Hip survival was significantly associated with patient age and size and with location of the lesion.

Conclusion

Authors found that steroid administration is most common cause of osteonecrosis of the femoral head.

References

1. Kang JS, Park S, Song JH, Jung YY, Cho MR, Rhyu KH. Prevalence of osteonecrosis of the femoral head: A nationwide epidemiologic analysis in Korea. J Arthroplasty. 2009;24:1178-83.
2. Mankin HJ. Nontraumatic necrosis of bone (osteonecrosis). N Engl J Med. 1992;326:1473-9.
3. Moya-Angeler J, Gianakos AL, Villa JC, Ni A, Lane JM. Current concepts on osteonecrosis of the femoral head. World J Orthop. 2015;6:590-601.
4. Mont MA, Cherian JJ, Sierra RJ, Jones LC, Lieberman JR. Nontraumatic osteonecrosis of the femoral head: Where do we stand today? A Ten-year update. J Bone Joint Surg Am. 2015;97:1604-27.
5. Liu F, Wang W, Yang L, Wang B, Wang J, Chai W, *et al*. An epidemiological study of etiology and clinical characteristics in patients with nontraumatic osteonecrosis of the femoral head. J Res Med Sci. 2017;22:15.
6. Microsurgery Department of the Orthopedics Branch of the Chinese Medical Doctor Association, Group from the Osteonecrosis and Bone Defect Branch of the Chinese Association of Reparative and Reconstructive Surgery, Microsurgery and Reconstructive Surgery Group of the Orthopedics Branch of the Chinese Medical Association. Chinese guideline for the diagnosis and treatment of osteonecrosis of the femoral head in adults. Orthop Surg. 2017;9:3-12.
7. Sugano N, Kubo T, Takoka K, Ohzono K, Hotokebuchi T, Matsumoto T, *et al*. Diagnostic criteria for non-traumatic osteonecrosis of femoral head. J Bone Joint Surg Br. 1998;81:590-5.
8. Lieberman JR, Berry DJ, Mont MA, Aaron RK, Callaghan JJ, Rajadhyaksha AD, *et al*. Osteonecrosis of the hip: Management in the 21st century. Instr Course Lect. 2003;52:337-55.
9. Steinberg ME, Steinberg DR. Osteonecrosis: Historical perspective. In: Koo KH, Mont MA, Jones LC, editors. Osteonecrosis. Heidelberg: Springer. 2014, 3-15.
10. Vardhan H, Tripathy SK, Sen RK, Aggarwal S, Goyal T. Epidemiological profile of femoral head osteonecrosis in the North Indian population. Indian J Orthop. 2018;52:140-6.
11. Ha YC, Jung WH, Kim JR, Seong NH, Kim SY, Koo KH. Prediction of collapse in femoral head osteonecrosis: A modified Kerboul method with use of magnetic resonance images. J Bone Joint Surg Am. 2006;88(3):35-40.
12. Yoo MC, Kim KI, Hahn CS, Parvizi J. Long-term follow up of vascularized fibular grafting for femoral head necrosis. Clin Orthop Relat Res. 2008;466(5):1133-1140.