Section: Orthopaedics

Research

A CLINICAL ANALYSIS OF AVASCULAR NECROSIS OF THE HEAD OF FEMUR

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Abstract

Background: The healthcare burden for the prevention and management of avascular necrosis is a complex phenomenon and it requires a proper management approach to lower unforeseen complications of this health issue. Diagnosis and management of avascular necrosis is a complex procedure and it requires certain medication to lessen complications of avascular necrosis at its early stages. NSAIDs help to relieve associated pain raises from avascular necrosis and the implication of medication on the affected part opens the underlying blood vessels. It is required to provide cholesterol-lowering medication and drugs for preventing vessel blockage associated with avascular necrosis. All the data was collected in MS Excel and presented in the form of tables and charts. The aim of the study is to conduct a dimensional analysis of avascular necrosis of head of femur in Indian population. To analyze the different presentations and management techniques for avascular necrosis disorder, to examine the Harris Hip score and the surgical management methods of the affected patients, to interpret the risk factors those mainly cause the chosen disorder among Indian Population. **Materials and Methods:** All the patients who consented to be included in the study underwent detailed history taking. All the necessary clinical examinations were performed. Investigations like X Ray, MRI and CT scan were done. Harris Hip Score was calculated based on standard protocols. All the data was collected in MS Excel and presented in the form of tables and charts. **Result:** It has been observed that about 73.9% of the patients are males, and about 26.1% are females. 26% of patients belonged to the age group of 31-40 years showing predominance. Additionally, it has come into an observation that 29% of the patients are found to be smoking in 21% of the risk factors involved. In addition, results indicate that bilateralism is predominant with 89% of occurrence, while 73% of cases are managed with surgical aids and in 47% involves bone grafting. **Conclusion:** Research and study are necessary for the context of India for lowering associated complications of vascular necrosis and it will lower the issues arising due to it. The high rate of morbidities and higher prevalence among young adults has increased the research concern among the Indian population.

INTRODUCTION

"Avascular necrosis (AVN)" is one disorder that is observed to affect approximately 10,000 to 20,000 unaffected people, each year on a global scale. The appearance of symptoms is observed in end portions of "long" bones of the body such as the humerus and femur.[1] This disease can affect both women and men ages about 30 to 40 years. It can be termed a global burden affecting a huge number of people each year worldwide.

AVN also known as osteonecrosis is a phenomenon of death in "tissue" of bone because of interruptions caused in blood supply. In early stages of this disorder, there are no visible symptoms observed. Gradually development of pain in the region of joints is observed that tends to restrict movement in individuals. Complications may include collapsing

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of joints or bones.[2] Hematopoietic cells that are present in the body are ones that are most sensitive to a low supply of oxygen and are first to suffer death due to removal or reduction in blood supply within a stipulated period of about 12 hours. Some recent studies suggest that bone cells or osteocytes undergo death within a period of 10-24 hours and cells in bone marrow tend to die within about 5 days. Repair of affected bones usually occurs with help of two phases, angiogenesis followed by movement of undifferentiated mesenchymal cells.[3] This is followed by differentiation of mesenchymal cells into fibroblasts or osteoblasts. The main risk factors include joint dislocations, bone fractures, intake of high steroid doses, and even alcoholism.[4] The digital tools that help in diagnosing this disorder include MRI scans and bone scintigraphy.

There are very few researches that are conducted based on this disorder in India and negligible people know about the complications that are associated with this disorder. So, this study is performed in order to improve the existing health condition of India and thereby make more people aware of the severity and risk factors that are associated with the disease.[5,6]

MATERIALS AND METHODS

Study Design: This was a hospital based observational study.

Study Setting: Department Of Orthopaedics, Government Medical College and Hospital, Nalgonda.

Study Duration: One year January 2021 to January 2022

Sample Size

146 patients with Avscular Necrosis of head of Femur.

All the patients who consented to be included in the study underwent detailed history taking. All the necessary clinical examinations were performed. Investigations like X Ray, MRI and CT scan were done. Harris Hip Score was calculated based on standard protocols. All the patients over 20 years of age with radiologically and clinically proven avascular necrosis of head of femur were included in the study. Patients below 20 years of age, those did not give consent and failed to follow up were excluded from the study.

Statistical Analysis

All the data was collected in MS Excel and presented in the form of tables and charts.

RESULTS

Based on [Table 1], it can be stated that about 73.9% of the patients are males, and about 26.1% are females. Thus, it can be stated that males are more prone to the disorder. necrosis as compared to female counterparts.

According to the [Table 2], it has been observed that most of the patients are in the range of 30 to 60 years. About 26% of patients are between ages of 31-40 years, and 20% of affected patients are between age 41 to 50 years and about 23% are between the ages of 51 to 60 years. Analysis from table 2 data revealed that the most affected age group who are potential victims of avascular necrosis lies within the age group 31 to 40, which accounts for 26%.

In the [Table 3], it can be can be depicted that the risk factors in 29% of the patients are found to be smoking. In 21% the risk factors involved are unknown and in the case of 7% of patients, the risk factor is found to be alcoholism. The most common etiological factor from table 3 analysis reveals the impact of smoking on patients.

According to [Table 4], it has come into an observation that about 89% of the affected patients were bilateral. Apart from this, only 7% are found to be U/L left and about 4% are found to be U/L right.

As per the provided [Table 5], it can be mentioned that the Harris Hip score in about 40% of the affected patients is found to be within the score range of 70-79%. Besides this, only 5% of the diagnosed patients are observed to have a Harris Hip score in the range of 90-100%. Harris's hip score was most under fair, which accounts for 70 to 79%, which is found among 59 patients counting 40%.

The mentioned [Table 6] indicates that 73% of the management techniques are found to be surgical and 27% are conservative. Management conservation analysis of the table revealed that 39 patents require conservative management while 107 patents require a surgical management approach.

The [Table 7] presents that the surgical method used in 47% of the patients is bone grafting. Analysis of [Table 7] data provides more common surgical procedures that were taken into consideration from the analysis of result-relieved implication of bone grafting in 69 patients accounting for 47%.

Table 1: Gender Distribution

Gender	No of Patients
Male	108 (73.9%)
Female	38 (26.1%)
Total	146 (100%)

Table 2: Age Distribution

Age	No of Patients
21-30 Years	23 (16%)
31-40 Years	38 (26%)

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41-50 Years	29 (20%)
51-60 Years	34 (23%)
61-70 Years	22 (15%)

Table 3: Etiology

Etiology	No of Patients
Idiopathic	30 (21%)
Steroid Use	13 (9%)
Smoking	42 (29%)
Alcoholism	10 (7%)
Chronic Illness	24 (16%)
Blood Disorders	27 (18%)

Table 4: Laterality

Laterality	No of Patients
U/L Right	6 (4%)
U/L Left	10 (7%)
Bilateral	130 (89%)

Table 5: Harris Hip score

Score	No of Patients
Poor (<70%)	56 (38%)
Fair (70-79%)	59 (40%)
Good (80-89%)	23 (16%)
Excellent (90-100%)	8 (5%)

Table 6: Management

Management	No of Patients
Conservative Management	39 (27%)
Surgical Management	107 (73%)

Table 7: Surgical Management

Type Of Surgery	No of Patients
Core Decompression	56 (38%)
Bone Grafting	69 (47%)
THR – Total Hip Replacement	21 (14%)

DISCUSSION

From [Table 1], it is observed that about 73.9% of the patients diagnosed are males. In addition to this, as per the information in previous studies, about 75% of the patients diagnosed were males.[7]

In this study, from [Table 2], it is seen that about 20% of patients are found to be within the age group 41-50 years and about 23% of the patients are found to be within the age group 51-60 years. In support with this, according to previous studies, 33.3% of the patients were found to be in the age group of about 41-60 years.[6] Besides this, in this study, it has been found that the Harris Hip score within 40% of the patients is found to be within the range of 70-79%. In comparison to this, the Harris Hip score was about 45% in the patients diagnosed.[8]

From [Table 3], it is clearly observed that smoking served as a risk for about 29% of the patients. In comparison to this, according to previous research, the risk factors of about 25% of the patients were unknown.[9,10]

From [Table 4], it is seen that 89% of the diagnosed patients are bilateral. Furthermore, according to previous research, 87% of the diagnosed patients were found to be bilateral.[11] Besides this, in this study, it can be observed that about 47% of the diagnosed patients have to undergo bone grafting as management. It is also supported by the previous research, about 50% of the diagnosed patients had to undergo bone grafting as a management process.[12]

From [Table 5], it is noticed that about 38% of the diagnosed patients have a Harris Hip score of less than 70%. On the contrary, according to previous research, about 41% of the diagnosed patients have a Harris Hip score of less than 75%.[13]

From [Table 6], it is seen that about 27% of the diagnosed patients have to undergo conservative management techniques. On the contrary, according to previous research, about 30% of the diagnosed patients had to undergo conservative management techniques.

From [Table 7], it has been found that about 14% of the patients have to undergo THR – Total Hip Replacement and in addition to this, according to the previous studies about 10% of the patients had to undergo total replacement of the hip. In this study, it has come into an observation that the risk factors of patients in about 21% of the patients are unknown. According to previous research, risk factors of about 25% of the patients were unknown.[10]

In this study, it has been found that about 14% of the patients have undergone THR – Total Hip Replacement. On the contrary, in the previous studies, it was found that about 22.2% of the

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diagnosed patients had to undergo hip arthroplasty.[5]

CONCLUSION

Research and study are necessary for the context of India for lowering associated complications of vascular necrosis and it will lower the issues arising due to it. The high rate of morbidities and higher prevalence among young adults has increased the research concern among the Indian population.

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