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RESEARCH ARTICLE

EVALUATION OF THE OUTCOMES OF CULTURE POSITIVE INFECTIONS FOLLOWING AN UNEVENTFUL ARTHROPLASTY- A SINGLE INSTITUTION EXPERIENCE

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Abstract

Total hip or knee replacement, especially, has been a resort for many individuals plagued with deforming joint pathologies, alleviating pain, and improving joint mobility, but is not without complications. Prosthetic joint infection is the most commonly occurring early and late complication of PJI. Any PJI which develops thereafter is considered to be late, irrespective of the stability of the components. It is important to realise that PJI does not only reflect an infection of the prosthetic interface, but also an infection of the surrounding bone and soft tissues. Hence we conducted this study to demonstrate the incidence of PJI following an uneventful arthroplasty.

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Introduction:-

Arthroplasty in India has gained popularity in recent times as it has been identified as a lifestyle enhancement procedure, especially for those middle aged and elderly people suffering from this debilitation (1). Total hip or knee replacement, especially, has been a resort for many individuals plagued with deforming joint pathologies, alleviating pain, and improving joint mobility. While it is shown to be a relatively safe procedure, it is not without its complications. Septic complications, otherwise referred to as Prosthetic Joint Infection (PJI) are not uncommon, owing to the presence of an implant (2)

Current guidelines of the American Academy of Orthopaedic Surgeons (AAOS), (2) the Infection Disease Society of America (IDSA) (1) the International Consensus on PJI, (3) and the Liostal Algorithm from Switzerland⁴ make a clear distinction between early and late PJIs: an early infection is considered to occur within three weeks of the procedure, or in the case of a late haematogenous infection, within three weeks of the development of symptoms. Any PJI which develops thereafter is considered to be late, irrespective of the stability of the components. It is important to realise that PJI does not only reflect an infection of the prosthetic interface, but also an infection of the surrounding bone and soft tissues (4).

There has been a lot of recent research into diagnosis and treatment options. However, there have been not many studies to research the changing trends in organisms causing PJI and the resulting outcome of the same.

Hence, this study was aimed at evaluating the aetiopathogenesis and outcomes of patients suffering with culture positive infections following arthroplasty.

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Methods And Materials:-

This study was conducted in M.S.Ramaiah Medical College in the department of Orthopaedics between June 2020 to June 2022. Patients with culture proven prosthetic joint infection were identified with the data obtained from the Department of microbiology. The Inpatient and Outpatient records of the respective patients were accessed and contact numbers were obtained.

Data was retrospectively collected from case records and was recorded in a semi-structured pro forma. The relevant information was then entered in a MS Excel spreadsheet.

The data collected included demographic details, surgery performed, duration of surgery and the complications associated with the same. In the post-operative period, the details of the culture from the joint aspirate was also recorded.

The data was then analysed using SPSS software v21. Categorical variables were represented as mean and median where appropriate. Ordinal variables were represented as proportions and ratios where deemed necessary. A p value of <0.05 was considered to be statistically significant.

Results:-

After a thorough record search, we identified 24 cases of prosthetic joint infection after an uneventful arthroplasty. Out of the 24 patients assessed, 15 were male and the remaining 9 were female patients with ages ranging from 32 years to 82 years. The mean age was 56.42 with a median age of 56 and a standard deviation of 12.448. Patients were included from all three units of Orthopaedics in the institution. 16 out of 24 patients had their index surgery in our institute whereas the remaining 8 had their index surgery elsewhere. The total number of admissions to the hospital varied from 1 to 4 and the duration of admission varied from 8-126 days with a mean duration of 37.5 days and median of 31.5 days with a standard deviation of 27.67 days.

16 patients out of the 24 underwent some form of arthroplasty for the hip and the remaining 8 underwent knee arthroplasty. In the 16 patients who underwent arthroplasty of the hip, 7 underwent Total hip replacement, 5 underwent bipolar hemiarthroplasty and 4 underwent revision arthroplasty. 3 out of 16 hips were cemented and the rest was uncemented.

When the culture reports were analysed, it revealed that of the infections, 8 were Staphylococcus aureus, 4 were Gram Negative Bacilli (GNB), 6 were Coagulase Negative Staphylococcus aureus, 4 were Enterococcus, 1 was β hemolytic streptococcus and 1 was a chronic infection due to Mycobacterium tuberculosis that had a superadded infection with GNB. A draining sinus was present in 7 patients and the diagnosis of PJI was made on the basis of culture and blood tests in the remaining 17 patients.

There was a predisposition for infections by GNB in females and there was a definite increase in the number of infections caused by GNB overall in the study population. However, this was not found to be statistically significant.

Functional outcomes were also considered following both THA and TKA. For THA, Modified Harris Hip score was utilized, 5 had a score less than 60. Following TKA, New oxford knee score was used and it was found that 3 patients had a score between 0-19 (poor), while 3 had a score between 40-48 (excellent).

Discussion:-

Periprosthetic joint infection is a devastating complication following a joint arthroplasty. Though, there are a lot of studies that have explored various diagnostic modalities and organisms implicated, there was a lacuna in the current knowledge on the outcomes of patients following PJI.

In the study, we noticed that there was no difference between the age groups affected in terms of organism causing infection and also outcome. However, there was a significant increase in the duration and number of admissions in people who suffered PJI due to either MRSA or ESBL. ESBL had a longer median duration of admission with a median of 56 compared to 38 for MRSA.

A total of 37.5% of prosthesis was retained and survived whereas 62.5% of people who suffered from PJI had failed implant and had to undergo revision surgery or some other salvage procedure.

The patients who had implant survival predominantly had infections caused by organisms of low virulence like CONS and Enterococcus (66.6%). Only 33.3% of patients who had implant survival were affected by organisms of higher virulence. However, these 3 patients (2 infections were caused by Staphylococcus aureus and one by GNB) were sensitive to the first line of antibiotics and responded well to treatment with specific antibiotics. In a study done Berbari EF et al (4,5) and Lee et al (6), S. aureus and coagulase-negative staphylococci, which contribute to between 50 and 60% of PJIs, while streptococci and enterococci together account for only approximately 10% of cases. The proportions

The study revealed that PJI due to ESBL had a rather grim prognosis with more failures and more salvage procedures being performed to eradicate infection.

From the results we can observe that infections caused by ESBL had the worst prognosis and also had a poorer outcome in patients who underwent revision arthroplasty.

Conclusion:-

PJI is a uncommon, but life-threatening complication of THA and TKA, and we need to keep in mind the consequences of the same while evaluating patients for surgeries. Pre-operative optimization, intra-operative technique and post-operative antibiotic coverage are key in preventing such events.

References:-

1. Osmon DR, Berbari EF, Berendt AR, et al. Executive summary: diagnosis and management of prosthetic joint infection: clinical practice guidelines by the Infectious Diseases Society of America. Clin Infect Dis 2013;56:1–10. Crossref, Medline, ISI
2. Della Valle C, Parvizi J, Bauer TW, et al. American Academy of Orthopaedic Surgeons clinical practice guideline on: the diagnosis of periprosthetic joint infections of the hip and knee. J Bone Joint Surg [Am] 2011;93-A:1355–1357. Crossref, Google Scholar
3. Zmistowski B, Della Valle C, Bauer TW, et al. Diagnosis of periprosthetic joint infection. J Orthop Res 2014;32 (suppl 1):S98–S107.
4. Berbari EF, Osmon DR, Carr A, Hanssen AD, Baddour LM, Greene D, Kupp LI, Baughan LW, Harmsen WS, Mandrekar JN, Therneau TM, Steckelberg JM, Virk A, Wilson WR. 2010. Dental procedures as risk factors for prosthetic hip or knee infection: a hospital-based prospective case-control study. Clin. Infect. Dis. 50:8–16. 10.1086/648676
5. Berbari EF, Hanssen AD, Duffy MC, Steckelberg JM, Ilstrup DM, Harmsen WS, Osmon DR. 1998. Risk factors for prosthetic joint infection: case-control study. Clin. Infect. Dis. 27:1247–1254. 10.1086/514991
6. Lee J, Kang CI, Lee JH, Joung M, Moon S, Wi YM, Chung DR, Ha CW, Song JH, Peck KR. 2010. Risk factors for treatment failure in patients with prosthetic joint infections. J. Hosp. Infect. 75:273–276.