

# Acute Pyogenic Arthritis Seen In a Tertiary Teaching Hospital in Manipur.

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## ABSTRACT

**Background:** Acute pyogenic arthritis continues to be a major orthopaedic problem. The morbidity and mortality of delayed treatment is very significant. **Aims & Objectives:** To study the aetiology, predisposing factors and to evaluate the factors influencing outcome in the treatment of acute pyogenic arthritis. **Methods:** Forty-five consecutive cases of acute pyogenic arthritis of various joints of the body presenting to RIMS Hospital, Imphal were admitted and treated either operatively or non-operatively and the outcome of treatment was evaluated using modified Rosenthal et al criteria. The factors that influenced the outcome were identified and analysed. **Results:** There were 60% excellent, 15% good, 10% fair and 15% poor results. The median duration of symptoms prior to diagnosis and treatment in excellent group was seven days whereas it was 40 days in poor group. Superficial joints such as knee had better results than deep joints such as hip and shoulder. Infections caused by *Staphylococcus aureus* produced satisfactory outcome in 78.26% whereas those caused by the *Pseudomonas aeruginosa* and *E.coli* produced uniform poor results. Females had a less satisfactory outcome when compared with males. 85% of cases in this study had a minimum of one predisposing factor. **Conclusion:** Acute pyogenic arthritis continues to be a major health problem. It is a commonly seen clinical entity in day-to-day practice. With prompt and vigorous treatment, the results are not always unsatisfactory. The most important factor influencing final outcome was delay in diagnosis and treatment. A high index of suspicion is necessary because prompt diagnosis followed by vigorous and adequate treatment is the key to successful outcome.

**Keywords:** Acute pyogenic arthritis, Factors influencing outcome, Pre-disposing factors.

## INTRODUCTION

Acute pyogenic arthritis continues to be a major health problem in developing countries. Despite in-depth research into the pathophysiology and treatment, the morbidity and mortality remains significant, especially in extremes of ages. Serious complications still do occur even with the currently available treatment regimes. The question arises if we can improve the outcome. If so, how? Hence, there was need for a study.

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### Aims & Objectives:

This study attempts to identify the aetiology, predisposing factors, factors influencing the

outcome and suggest measures to improve the outcome of this potentially serious clinical condition.

## MATERIALS AND METHODS

Forty-five septic joints in 42 consecutive patients were treated in the department of Orthopaedics, Regional Institute of Medical Sciences (RIMS), Imphal from November 2001 to October 2003. After a detailed history and clinical examination, the affected joints were aspirated using a No. 18 G needle and sent for gram stain, culture and sensitivity, leucocyte counts and biochemical tests. Other routine examinations for urine and blood were then sent including C-reactive protein (CRP), blood culture and sensitivity and repeated at regular intervals. The local X-rays compared with contralateral joint also were taken along a chest X-ray. A broad spectrum antibiotic, depending on the age of patients (second or third generation

cephalosporin or amoxicillin plus clavulanic acid) was given parenterally. The limb was then immobilised.

Sixteen patients were treated non-operatively and twenty-six patients were treated operatively. Operative treatment by arthrotomy, copious lavage with normal saline followed by a negative suction drain was done in all of the following conditions: (i) if the pus on diagnostic aspiration was thick (ii) if duration of symptom is more than five days or more with severe pain and high fever (iii) if the patient's age is at extremes and (iv) if the response to conservative treatment was poor as indicated by a consistently high synovial fluid leucocyte count, culture positivity or continuously elevated ESR or CRP or lack of clinical improvement both locally and generally.

In other cases, non-operative treatment was done with daily aspirations and parenteral antibiotics. In either case, the parenteral antibiotics, changed after sensitivity test, was given for 2-3 weeks followed by oral to complete 4-6 weeks. Patients were followed-up regularly up-to 18 months. At each follow-up clinical examination along with local X-ray, haemoglobin estimation including ESR and CRP were done and recorded. Results were evaluated as excellent, good, fair or poor using our modification of Rosenthal et al criteria<sup>[1]</sup> at the end of follow-up (Table 1). The following parameters were taken into account for grading the final results in this study viz, Pain, Swelling, Discharging sinus, Local tenderness, Range of movement (degree restricted), Pathological dislocation(s), Joint instability, Deformity, Ankylosis (fibrous or bony), Persistently elevated ESR and CRP, and Radiographic changes in the affected joint(s). The outcomes were graded as (i) **Excellent:** No pain, stable, no deformity, full range of movements in the affected joint, normal ESR, negative CRP and normal radiology (ii) **Good:** No pain, stable, no deformity but limitation of ROM <5% of the normal contralateral joint, normal ESR, negative CRP and normal radiology (iii) **Fair:** No pain, stable, no deformity but limitations of ROM of 5-10% of the normal contralateral joint, some destruction of articular cartilage radiologically seen as narrowed joint space, normal ESR and negative CRP and (iv) **Poor:** Persistent pain and swelling, loss of function, persistent joint tenderness, limitation of ROM >10% of the normal contralateral joint, persisting discharging sinus, pathological dislocation, unstable joint, joint ankylosis, deformity, destruction of articular cartilage and bony erosions, persistently elevated ESR and CRP (any two or more of the above).

## RESULTS

The age of the patients ranged from neonates aged 20 days to elderly man of 69 years with a

maximum concentration of cases in 10-15 years age-group. Male to female ratio was 2:1. Knee joint was the commonest joint involved (48.89%). 92.86% of the cases were monoarticular. Patients presented to us at an average duration of 13.45 days with marked restriction of movement of the affected joint in 88.10%. The commonest causative organism identified was Staphylococcus aureus in this study. In children up-to 15 years old, the dominant organism identified was Staphylococcus aureus. In a 20 days' old neonate Streptococcus sp. was identified from the joint aspirate and Haemophilus influenzae was identified in an infant of eight months. In adults the most common organism identified was Staphylococcus aureus. Synovial cell count averaged 13,577 cells/mm<sup>3</sup> with 91% polymorphs. Average total leucocyte count (TLC), ESR and CRP were 10,150 cells/mm<sup>3</sup>, 88.85 mm/hr and 88 mg/L respectively. Trauma to the affected joint was the commonest predisposing factor (47.63%). Other predisposing factors identified were rheumatoid arthritis on systemic steroid, osteoarthritis, alcoholic liver disease, diabetes mellitus, local steroid injection, renal insufficiency and malignant diseases. Skin infection was the commonest primary source of infection identified (28.58%). The commonest late complication was restricted movement >10% as compared to the unaffected contralateral joint.

Factors that influenced the outcome were duration of symptoms prior to diagnosis and treatment, the infecting organism, situation of the affected joint whether superficial or deep, sex of the patients and predisposing factor(s).

The results at the end of follow-up were graded as excellent in 60%, good in 15%, fair in 10% and poor in 15% [Table 2].

**Table 1: Clinical outcome related to duration of symptoms.**

Outcome	Duration of symptoms before diagnosis and treatment (Median No. of days)	Range(days)
Excellent	7.0	2 - 20
Good	10.0	3 - 20
Fair	14.0	5 - 25
Poor	40.0	8 - 90

**Table 2: Final outcome at the end of follow-up**

Result	No. of patients	Percentage (%)
Excellent	24	60.00
Good	06	15.00
Fair	04	10.00
Poor	06	15.00
Total	40*	100.00

\*Two patients were lost to follow-up

## DISCUSSION

In this study, it was seen that the median number of days of delay in diagnosis and treatment was seven days in excellent group whereas it was 40 days in poor group. According to modified Rosenthal et al

criteria it was 10 days in good and 14 days in fair groups (Table 1). This clearly showed a progressive worsening of the final outcome if the delay in diagnosis is prolonged. This finding is consistent with those reported by other authors.<sup>[2-4]</sup> This delay in our study was because 71.43% (30 cases) of our cases were already treated usually by a general practitioner for more than a week with a course of parenteral or oral antibiotics without any local treatment which ideally should include immobilisation of the local part and frequent aspirations of the affected joint. The initial antibiotics should also be administered parenterally. So, most of these cases were treated inadequately before they reported to us. Also most of the remaining cases reported late to us.

*Staphylococcus aureus* was the commonest organism identified from this study. This was comparable to findings reported by other authors.<sup>[1]</sup> In infants and children also *Staphylococcus aureus* dominated and this agrees with other authors' findings<sup>[5-6]</sup>. In neonates *Streptococcus sp.* was identified as reported by Williams KD et al.<sup>[7]</sup> In older infants, identification of *H. influenzae* was consistent with that of Nelson JD and colleague.<sup>[8]</sup> In adults too, *Staphylococcus aureus* was the commonest organism identified (57.14%) and it was close to 64% as reported by Esterhai JL et al and Kelly PJ et al.<sup>[9,10]</sup>

The superficial joints e.g. knee (70% excellent result), ankle (62.50% excellent result) etc. had a better final outcome than deep joints e.g. shoulder (50% fair and 50% poor result), hip (50% excellent, 16.67% fair and 33% poor result ) etc. as reported by other workers.<sup>[11,12]</sup>

Infections caused by *S. aureus* produced 60.87% excellent results whereas infections caused by *Pseudomonas aeruginosa* and *Escherichia coli* produced uniformly poor results. This was comparable to study findings made by Petty W et al.<sup>[13]</sup> One-eighth of the female patients had excellent outcomes whereas less than half (47.50%) of male cases had excellent outcome. This is similar to the findings made by Meijers and colleagues.<sup>[14]</sup> 85% of our patients had a minimum of one predisposing factor, the commonest being trauma to the local part. The final outcome of acute pyogenic arthritis following systemic steroid produced excellent result in only 33% whereas only 28.57% excellent results was recorded from those with immune compromised patients (diabetes mellitus, alcoholic liver disease, malignant disease, renal failures). These findings were also comparable to findings made by Rosenthal and colleagues.<sup>[1]</sup> One case of injection of local steroid died due to septicaemia. Similar observation was made by Studahl and co-workers earlier.<sup>[15]</sup> Of the factors listed above, the one that the treating doctor

has some control is delay in diagnosis and treatment. Other factors are purely beyond the control of any physician.

## CONCLUSION

Acute pyogenic arthritis continues to be a major health problem because it is a commonly seen clinical entity in day-to-day practice and because of late reporting of cases. However, with prompt diagnosis and vigorous and adequate treatment the results are not always unsatisfactory. The most important factor influencing final outcome was delay in diagnosis and treatment. So a treating physician should have a high index of suspicion because prompt diagnosis followed by vigorous and adequate treatment is the key to successful outcome.

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