ACUTE SEPTIC ARTHRITIS AND ITS MANAGEMENT

Muhammad Shabir

Department of Orthopaedic,
Khyber Teaching Hospital,
Peshawar.

ABSTRACT

Objective: To know about the most common organism causing acute septic arthritis. To discuss the most effective antibiotic and best method of treatment of such patients.

Material and Methods: This study was conducted in the Department of Orthopaedic at Postgraduate Medical Institute/Lady Reading Hospital, Peshawar, from 1st March 1996 to 28th February 1997. The study was carried out, on 40 patients. The causative organism and management of acute septic arthritis is discussed. Patients were evaluated and culture sensitivity of synovial fluid was done. Antibiotics were administered on the basis of culture sensitivity for 2-4 weeks. All the septic joints were drained either through arthrotomy or by aspiration/irrigation. Follow up was done for 6-12 weeks.

Results: Hematogenous septic arthritis was more common and the highest incidence was found in children. Males were more commonly affected, than females. Previous treatment records of the patients showed that most of them were given antibiotics without culture/sensitivity. The disease is common in poor class. Most of the patients were having fever, pain, swelling and restriction of movements. In majority of cases septic arthritis was mono-articular. Hip was the most commonly affected joint, which also has the worst prognosis. TLC, DLC and ESR were found raised in majority of the patients. Staphylococcus aureus was the commonest organism and needed arthrotomy for good outcome. Second commonest organism was Streptococcus, which can even be treated with aspiration and irrigation, satisfactorily. First generation cephalosporin, ampicillin – cloxacinill, ampicillin – clavulonic acid combination and second-generation cephalosporins were the most effective antibiotics.

Conclusion: From this study we concluded that early diagnosis and proper treatment of septic arthritis decreases its morbidity. Method of
intervention makes little difference if the pre-intervention period is less than five days, except in deep joints.

**Key words:** Septic arthritis, Culture sensitivity, Staphylococcus aureus, Antibiotics, Arthrotomy.

---

**INTRODUCTION**

Acute septic arthritis is an acute inflammation of the joint caused by pus forming organisms. It is usually monoarticular. Any synovial joint may be involved, but the hip, knee and shoulder are the most commonly affected joints.\(^1^\,^2\) Diagnosis of septic arthritis in young children requires high index of suspicion, because lack of typical sign and symptoms cannot exclude the disease.\(^3^\,^4\,^5\) In infants its diagnosis is not an easy job, particularly when rarely affected joint is involved.\(^6^\,^7\) Prompt treatment is required to avoid disastrous outcome, especially in children.\(^8\) Different methods have been used for treating septic arthritis (arthroscopy, aspiration irrigation, arthroscopic drainage), with variable results. Arthroscopic method is the best,\(^9\,^10\) but it is not available everywhere.

**MATERIAL AND METHODS**

This study was conducted at Postgraduate Medical Institute, Lady Reading Hospital, and Peshawar from 1\(^{st}\) March 1996 to 28\(^{th}\) February 1997. Forty patients with acute septic arthritis, which were diagnosed clinically, radio logically and on laboratory investigation were included. Joint infection associated with hemi or total joint arthroplasty, fungal, Gonococcal and Tuberculous arthritis were excluded.

Patients were evaluated and culture sensitivity of synovial fluid was done. Antibiotics were administered on the basis of culture/sensitivity for 2-4 weeks. All the septic joints were drained either through arthrotomy or by aspiration/irrigation. Follow up was done for 6-12 weeks. Results were graded poor, good and excellent, after assessing for range of movement, pain relief and complete eradication of infection.

**RESULTS**

A total of 40 patients (male 23, female 17) from 1-60 years of age (mean=11 years) were studied. Most of the patients were having fever, pain, swelling and restriction of movements of the joint involved. Previous treatment record of the patient showed that most of them (57.5%) were given antibiotic without culture sensitivity. In

<table>
<thead>
<tr>
<th>Method of Treatment</th>
<th>No. of patients</th>
<th>Failure No.</th>
<th>Failure %</th>
<th>Successfully No.</th>
<th>Successful %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspiration/irrigation</td>
<td>21</td>
<td>12</td>
<td>57%</td>
<td>09</td>
<td>48.8%</td>
</tr>
<tr>
<td>Secondary arthroscopy</td>
<td>12</td>
<td>04</td>
<td>33.3%</td>
<td>08</td>
<td>66.65%</td>
</tr>
<tr>
<td>Primary Arthroscopy</td>
<td>19</td>
<td>08</td>
<td>42.15%</td>
<td>11</td>
<td>57.9%</td>
</tr>
</tbody>
</table>

**TABLE-1**
RESULTS RELATION TO PRE-INTERVENTION PERIOD

<table>
<thead>
<tr>
<th>Pre-intervention period</th>
<th>No. of Cases</th>
<th>Failure (%)</th>
<th>Successful (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 5 days</td>
<td>13</td>
<td>Nil</td>
<td>13 (100%)</td>
</tr>
<tr>
<td>5-10 days</td>
<td>16</td>
<td>5 (31.2%)</td>
<td>11 (68.8%)</td>
</tr>
<tr>
<td>&gt; 10 days</td>
<td>11</td>
<td>7 (63.6%)</td>
<td>4 (36.3%)</td>
</tr>
</tbody>
</table>

TABLE-2

16(40%) patients the pre-intervention period was 5-10 days, while in 11(27.5%) it was more than 10 days (Table-2).

Hip was the most commonly affected joint (40.8%) followed by; knee (31.8%). In majority of cases it was monoarticular (92.5%). ESR, TLC and DLC was found raised in 72.5%, 67.5% and 55% cases respectively. Culture of the synovial fluid was positive in 82.5% patients and Staphylococcus aureus was the commonest organism (57.5%) followed by Streptococcus pneumoniae (20%) (Table-3). First generation cephalosporin, ampicillin—cloxacillin, ampicillin—clavulonic acid combination were the most effective antibiotics (Table-4). In cases in whom the pre-intervention period was less than 5 days both the procedures were equally effective, but in cases in whom, the pre-intervention period was more than 5 days arthroscopy gave better results than aspiration and irrigation. Secondary arthroscopy even succeeded in eradicating infection in those cases where aspiration and irrigation failed (Table-1).

RESULTS RELATION TO CAUSATIVE ORGANISM

<table>
<thead>
<tr>
<th>Causative agent</th>
<th>No. of cases</th>
<th>Failure (%)</th>
<th>Successful (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staphylococcus aureus</td>
<td>23</td>
<td>11 (47.8%)</td>
<td>12 (52.2%)</td>
</tr>
<tr>
<td>Streptococcus</td>
<td>08</td>
<td>Nil</td>
<td>8 (100%)</td>
</tr>
<tr>
<td>Pseudomonas</td>
<td>01</td>
<td>1 (100%)</td>
<td>Nil</td>
</tr>
<tr>
<td>E.Coli</td>
<td>01</td>
<td>Nil</td>
<td>1 (100%)</td>
</tr>
<tr>
<td>No growth</td>
<td>07</td>
<td>Nil</td>
<td>7 (100%)</td>
</tr>
</tbody>
</table>

TABLE-3

DISCUSSION

All the patients studied had the clinical diagnosis of acute septic arthritis confirmed by bacteriology or radiographically. We have considered any residual clinical or radiographic abnormality as failure. In our study the ratio of adult to children is 1:1.9. This is also the finding of Shaw and Kasser who concluded that acute septic arthritis is common in children, however no ratio was given by them. Nduati and Wamola found that it is much more common in infants as compared to older children. In our study there were only three (7.5%) infants and no neonates. All the three infants were referred from paediatric ward. The probable cause may be lack of awareness about septic arthritis of infants and neonates amongst the general practitioners, who usually refer these patients to paediatrician and paediatric surgeon.

In this study the incidence of the disease was 15% higher in males as compared to females. Similar results were
Sensitivity results

<table>
<thead>
<tr>
<th>Antibiotics</th>
<th>Positive sensitivity</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st generation cephalosporin</td>
<td>30</td>
<td>90%</td>
</tr>
<tr>
<td>Ampicillin/Clavacillin</td>
<td>28</td>
<td>84%</td>
</tr>
<tr>
<td>Ampicillin/Clavulic acid</td>
<td>24</td>
<td>72.5%</td>
</tr>
<tr>
<td>Quinolones</td>
<td>03</td>
<td>69%</td>
</tr>
<tr>
<td>2nd generation cephalosporin</td>
<td>20</td>
<td>60%</td>
</tr>
</tbody>
</table>

TABLE - 4

reported by Chen CH et al and Youssef and York.

Previous treatment records show that majority of patients (57.5%) received haphazard treatment. Most of the patients were given antibiotics on trial and error basis without proper culture and sensitivity. This may be due to lack of awareness and under estimation of the value of culture and sensitivity and importance of selecting proper antibiotics by general practitioner and "Quacks" who usually treat these patients.

The main symptoms and signs were pain, fever, swelling and restriction of movements in the affected joints. Lavy et al and Chen CH et also reported in their studies the common presenting features were pain, fever, restriction of movement and swelling. In 16 patients (68.8%) the pre-intervention period was from 5-13 days. In Bennett and Namnyak series this period was more than five days in 55.5% patients (16). Our study indicates that most of the patients present late in the course of the disease. This may because, either in the initial stages the symptoms and signs were vague and overlooked by the parents, or the patients were improperly treated by Quacks and general practitioner.

In Le-Dantec et al series in 88% cases, septic arthritis was mono-articular and the most commonly affected joint being the knee, followed by hip, shoulder and sacroiliac joint. Our results were similar to Le-Dantec et al, series, with only difference, that in our study hip was the most commonly affected joint, rather than knee. This difference may be due to the fact that septic arthritis of the hip is more common in paediatric patients. In our study majority of the patients were children, while in Le-Dantec et al series majority of the patients were adults. We found ESR raised in 72.5% of patients, while total leucocyte count was raised in 65% patients. Similar were the finding of Chen Ch et al. The culture of the synovial fluid was positive in 82.5% patients. Our bacteriological results are similar to those reported by Le-Dantec et al, Youssef and York and Dagan who found Staphylococcus aureus, the commonest organism, followed by streptococci, pseudomonas and E.coli. We have confirmed that staphylococcus aureus (57.5%) was the most common bacteria responsible for acute septic arthritis.

The sensitivity report showed that first generation cephalosporins were the most effective antibiotics, followed by cloxacillin - ampicillin, ampicillin - clavulonic acid and second generation cephalosporin in descending order. In Bennett and Namnyak study, combination of cloxacillin - ampicillin was found to be the most effective antibiotic. This difference may be due to non-uniformity of antibiotic sensitivity testing discs.

Sensitivity to quinolones and third generation cephalosporin were shown in minimum number of cases. This may be due
to the fact that in majority of cases culture sensitivity testing discs for quinolones and third generation cephalosporin were not available in our hospital, therefore no comments can be given about the efficacy of these drugs in acute septic arthritis.

Certain causative organism appear to warrant open drainage procedures as compared to aspiration/irrigation. Only one of the eight patients with staphylococcus aureus treated by needle aspiration/irrigation responded favorably, compared with 8 to 15 treated by primary arthroscopy. Three of the 8 patients with streptococcus infection treated by needle aspiration/irrigation did not respond favorably. Two of these three patients were infants with multiple joint involvements. Similar were the results of Lane et al.16

In this study the complication rate was 30%. Majority of these patients had initial septic arthritis due to staphylococcus aureus. The study of Bennett and Namnyak also showed that staphylococcus aureus was the poor prognostic factor.16 The high percentage of poor sequelae in these patients may be caused by the production of toxins such as staphylokinase, which have a direct destructive effect on articular cartilage.

We have no failure in treating acute septic arthritis either by aspiration/irrigation, or by arthroscopy, in patients in whom the pre-intervention period was less than 5 days. Similar results were reported by Bennett and Namnyak.16 Therefore it may be suggested that, the pre-intervention period is the most important prognostic factor. Out of 18 hip septic arthritis, we had unsatisfactory results in 8(44.4%) patients. While Chen CH et al have failure in 19% cases of their study.18 This difference may probably be due to difference of pre-intervention period. We received 72% of the septic hip late during the course of the disease.

This study also confirmed that septic arthritis of the hip, which is difficult to diagnose, needs urgent treatment.

**CONCLUSION**

From this study, we conclude that early diagnosis of acute septic arthritis must be made particularly of the hip joint in order to avoid serious morbidity. Antibiotics should be given on the basis of culture and sensitivity.

**REFERENCES**


Address for Correspondence:
Dr. Muhammad Shabir,
Trauma Casualty,
Lady Reading Hospital,
Peshawar.