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Research Article

PRESENTATION AND CLINICAL FEATURES OF CHILDREN WITH SEPTIC ARTHRITIS

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Abstract:

Background: Septic arthritis (SA) is known to be an infectious disease emergency. Children age groups are affected more with SA in comparison to adults. The aim of the current study was to find out the presentation and clinical features of SA amongst children aged 2 to 15 years.

Material and Methods: This descriptive cross-sectional study was conducted from January 2017 to May 2019, in children having SA, aged less than 16 years of age. Institute of Child's Health, Multan, and Mayo Hospital, Lahore, Pakistan were the centers for this study. A total of 46 patients with a diagnosis of SA, admitted for more than 24 hours, were enrolled in the study. Demographic features like age and gender, symptoms at the time of presentation, laboratory findings as well as joint involvement were recorded. SPSS Version 20.0 was used for data entry and statistical analysis.

Results: There were 29 (63.0%) male and 17 (37.0%) female. Majority of the children, 33 (71.7%) were below 4 years of age. Most common reported symptoms at the time of admission was recorded to be fever, found in 34 (73.9%), joint swelling was noted in 20 (43.5%) children while joint pain or decreased usage of involved joint were noted in 44 (95.6%). Most common joint involved was noted to be hip, found in 28 (60.9%), followed by knee 10 (21.7%).

Conclusion: Most of the children with SA were male, had age below 4 years. Joint pain or decreased usage of involved joint and fever at the time of admission was the commonest presentation. Hip and Knee joints seemed to be most involved in children with SA.

Key Words: Septic arthritis, fever, joint pain, hip, knee.

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INTRODUCTION:

Septic arthritis (SA) is known to be an infectious disease emergency. Children age groups are affected more with SA in comparison to adults.¹ Amongst children, incidence of SA is noted between 1-37 per 100000¹⁻³ while in the United States, 3-4 per 100,000.⁴ Children less than 4 years of age seem to be influenced most with SA. Most commonly involved joints are noted to be hip and knee joints.⁵

Haematogenous bacterial spread is known to be the commonest reason of SA in children.⁶ Delay in the early control of infection related to septic arthritis may go on to cause long-term damage to joints as well as in rare cases, it can disseminate infection.¹ Pyogenic infections related to joint space are complicated due to avascular necrosis as well as by the destruction of the cartilage of the joints. Long term sequelae of septic arthritis include chronic arthritis while need for the joint replacement may also arise.⁷ Due to all these reasons, timely diagnosis of septic arthritis and its effective management is essential to reduce its short term as well as long term complications.⁸

Children with SA are usually presented with an onset of pain that is of acute nature involving joints.⁹ Lower limb joints are usually unable to bear weight while subcutaneous joints like knee or ankle may present with effusion that involves swelling as well as warmth. Passive movement of joints is quite painful. Clinically, many researchers have got that having history of non weight bearing joint and temperature more than 38.5 °C are noted as the most authentic signs distinguishing SA and transient synovitis.^{10,11}

Staphylococcus aureus is found to be the most frequent causative agent amongst children with osteoarticular infections.¹² It has also been noted that standard culture is not able to find cause of SA in about half of the cases. *Kingella kingae* has been labeled as a regional pathogen, found more in children who are between the age of 6 to 36 months.¹³ *E. coli* has been found commonly in birth canal so seem to have been present in majority of the neonates with SA.¹⁴

Not much is done at our settings regarding SA so we aimed this study to find out the clinical features as well as the demographics of SA amongst children aged 2 to 15 years. This study is thought to be proven helpful presenting us very helpful data and helping us enabling early diagnosis as well as subsequent management of SA.

MATERIAL AND METHODS:

This descriptive cross-sectional study was conducted from January 2017 to May 2019, in children having SA, aged less than 16 years of age. Institute of Child's Health, Multan, and Mayo Hospital, Lahore, Pakistan were the centers for this study. A total of 46 patients with a diagnosis of SA, admitted for more than 24 hours, were enrolled in the study. SA was labeled¹⁵ in children who had clinical symptoms of SA (fever, irritability, reduction in ambulation, reduction in weight bearing of the affected extremity, pain or tenderness, erythema, swelling and restricted range of motion of the affected joint), joint fluid white blood cell (WBC) count of more than 50000 per uL or positive joint fluid or blood culture. Those children who had received any sort of antibiotics in the last 72 hours prior to collection of joint fluid for culture, those who had any prior joint fluid evaluation at any other healthcare facility, those with positive Lyme serology were not enrolled for the study. Children having comorbidities like primary immunodeficiency, malignant diseases, transplant, receipt of an immunosuppressive medication, sickle cell disease, trauma, presence of foreign body at infection's site or needing admission in ICU were also excluded from this study.

Demographic features like age and gender, symptoms at the time of presentation, laboratory findings as well as joint involvement were recorded for all children on a predesigned proforma. All the laboratory investigations were sent to institutional laboratories for the results. SPSS Version 20.0 was used for data entry and statistical analysis. Quantitative variables were presented as mean and standard deviation while qualitative variables were described in terms of frequency and percentages.

RESULTS:

Out of a total of 46 children, there were 29 (63.0%) male and 17 (37.0%) female. Mean age of the children was 4.7 years with a standard deviation of 2.4 years while majority of the children, 33 (71.7%) were below 4 years of age. Most common reported symptoms at the time of admission was recorded to be fever, found in 34 (73.9%), whereas mean duration of fever was noted to be 3.7 days with a standard deviation of 1.4 days. Joint swelling was noted in 20 (43.5%) children while joint pain or decreased usage of involved joint were noted in 44 (95.6%). Mean duration of symptoms before admission was recorded as 4.6 days with a standard deviation of 1.5 days. In terms of joints involved in children with SA, most common joint was noted to be hip, found in 28 (60.9%), followed by knee 10 (21.7%), foot 3 (6.5%), elbow 3 (6.5%) and shoulder 2 (4.3%).

With regards to laboratory findings at the time of presentation, mean peripheral WBC count was noted as 14648 per uL with a standard deviation of 2835 per uL. Mean joint fluid WBC count was 118849 per uL with a standard deviation of 28358 per uL. Mean neutrophil (%) in joint fluid were seen as 88.3% with standard deviation of 3.8%. Mean value of c-reactive protein was observed as 8.6 mg/dL with a standard deviation of 2.2 mg/dL. Mean erythrocyte sedimentation rate was noted as 57 mm/h with a standard deviation of 13.5 mm/h.

Table No.1: Reported Symptoms in Children with Septic Arthritis

Reported Symptoms	Number (%)
Fever	34 (73.9%)
Joint swelling	20 (43.5%)
Joint pain or decreased usage of involved joint	44 (95.6%)

Table No.2: Joints Involved in Children with Septic Arthritis

Joint Involved	Number (%)
Hip	28 (60.9%)
Knee	10 (21.7%)
Elbow	3 (6.5%)
Foot	3 (6.5%)
Shoulder	2 (4.3%)

Table No.3: Laboratory Findings in Children with Septic Arthritis

Reported Symptoms	Mean \pm Standard Deviation
Peripheral WBC Count (per uL)	14648 \pm 2835
Joint Fluid WBC Count	118849 \pm 28358
Neutrophil (%)	88.3 \pm 3.8
C-Reactive Protein (mg/dL)	8.6 \pm 2.2
Erythrocyte Sedimentation Rate (mm/h)	57.4 \pm 13.5

DISCUSSION:

As presentation of SA is variable in many ways but most often, acutely swollen and red joint having pain with restricted movement along with fever is accompanied. Affected cases refuse bearing of weight if the lower limb is affected.¹²

In the present study, we noted a male predominance as has been the case in many other studies and it is an established fact that male children are more affected with SA.^{6,15} A recent nationwide survey of pediatric

arthritis in the US showed a male to female ratio of 1.7:1.⁴

In the current study, it was also noted that majority of the children, 71.7% were below the age of 4 years. Our results were quite consistent with those found earlier where it has been observed that SA has a marked inclination towards children of less than 4 years of age.^{5,15}

Our study recorded that most common reported symptoms at the time of admission was recorded to be fever, found in 73.9% cases, followed by Joint swelling in 43.5% whereas joint pain or decreased usage of involved joint were noted in 95.6%. Our results were very similar to what was found in another study done by Spyridakis E et al¹⁵ where they found fever to be present in 70.0% children with positive culture SA. The same study also noted that Joint pain or decreased use of affected joint was present in 92.5% children. Similar results have been found by others as well.¹⁶

In the current work, most common joint involved was noted to be hip, found in 28 (60.9%), followed by knee 10 (21.7%), foot 3 (6.5%), elbow 3 (6.5%) and shoulder 2 (4.3%). Data from around the world shows that most commonly involved joints are noted to be hip and knee joints.^{15,17}

It has been endorsed that all children who present having symptoms of joint pain along with the fever should always be evaluated for SA whereas diagnosis should always be confirmed using joint puncture as well as a sample asking bacteriology prior to intravenous antibiotics administration.^{14,18} Immediate referral to emergency department of a healthcare facility is a common practice when a child presents with signs and symptoms of SA. In those children who are presenting with joint limping without any history of fever, transient synovitis is suspected more and these cases should be continued with non-steroidal anti-inflammatory drugs (NSAIDs) with a follow up on next day. In cases which are reported in showing ambiguity in the diagnosis of SA, urgent referrals should be made emergency departments.

In terms of limitations of the study, there were few. We could not gather the data about the culture reports or pathogens involved in the studied cases. Information about the treatment during the admissions as well as surgical procedures done during the stays could not be documented for this study. Regular follow ups involving reviews of any possible other diagnosis could also not be made for these SA cases.

CONCLUSION:

Most of the children with SA were male, had age below 4 years. Joint pain or decreased usage of involved joint and fever at the time of admission was the commonest presentation. Hip and Knee joints seemed to be most involved in children with SA.

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