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CODEN: IJBRFA **Case Report**

Salmonella Typhi: A cause of septic arthritis knee: A Rare entity

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Abstract

Salmonella species *enterica* subspecies *enterica* serovar Typhi infection may result in various presentations like enteric fever, septicaemia with and without local suppurative lesions, gastroenteritis and the carrier state. Arthritis is an uncommon and rare manifestation of salmonella infection. Here, we report a case of septic arthritis of knee in a patient with benign prostate hypertrophy and catheter *in situ*. The case is presented for its rarity and to highlight the atypical manifestations of *Salmonella Typhi* in endemic regions. Hence salmonella species must always be kept in mind for the differential diagnosis of septic arthritis in a clinically relevant setting. Although few case reports have been reported signifying *Salmonella enteritidis* as a cause of septic arthritis knee however this is the first report of septic arthritis knee caused by *Salmonella Typhi*.

Keywords: septic arthritis, salmonella, knee joint.

1. Introduction

The local suppurative lesions may involve any site in the body including the osteoarticular tissue. Localized salmonella infections usually present following Salmonella bacteraemia, but sometimes it may occur after enteric fever or gastroenteritis [1-2]. Though dissemination of infection can occur but, septic arthritis due to *Salmonella Typhi* is rare especially of knee joint. Most of the patients with such metastatic infective lesions have underlying chronic disease or immunosuppressive state [3-4]. But there are studies which have reported septic arthritis cases without predisposing factors.

2. Case History

An 80-year-old male patient came to the orthopaedic ward with chief complaints of acute pain, restriction of movements in right knee joint for past 5 days. The patient was a known case of benign prostate hypertrophy with catheter in situ for past one month. The patient did not report any episode of fever over the preceding months. There was no history of trauma, prior surgery, or abdominal discomfort. There was no history of illness suggestive of typhoid fever in any of his family members. Local examination of the right knee region showed red, swollen joint with severe tenderness and the movements were painfully restricted.

The laboratory findings were haemoglobin 12.8 gm%, white blood cell count 12,180 cells/cu.mm with neutrophilic leukocytosis. ESR was 32 mm/hour. X-ray knee was done which showed age related early osteoarthritic changes (Figure 1). Pus was aspirated from the knee joint and was inoculated in brain heart infusion broth, nutrient agar, 5% sheep blood agar, and MacConkey agar and incubated for 24 hours at 37^0C. The Gram stained smear of the pus showed plenty of polymorphonuclear cells and gram negative bacilli. The culture yielded non-lactose fermenting bacterial colonies which were confirmed as *Salmonella enterica subspecies enterica serovar Typhi* with biochemical reactions and serological typing.

On performing antibiotic susceptibility by disk diffusion method, isolate was found to be susceptible to

ampicillin, chloramphenicol, ciprofloxacin, cefotaxime, and ceftriaxone, cefepime, piperacillin-tazobactam, amoxicillin-clavulanic acid.

Blood culture, Widal test and stool culture was simultaneously done to find out the source of infection or probability that the patient might be a carrier. The blood culture (performed by both BACTEC 450 and manual method) was found to be sterile after 5 days of aerobic incubation. Both, Widal test and faecal culture were non-significant.

Treatment with ciprofloxacin 500mg twice daily was instituted and continued for 3 weeks along with repeated aspirations. Fortunately on follow up, patient is relatively asymptomatic with only minimal discomfort.

Figure 1: X-ray right knee (AP/Lateral view)

3. Discussion

The genus Salmonella being enteroinvasive and enteropathogenic, consists of a large heterogeneous group of gram negative bacilli. Infection is usually transmitted by ingestion of contaminated food or water [3]. Many case reports have been published reporting that osteoarticular infections occur in the immunosuppressed patients commonly, but in our study the patient was immunocompetent [3-5]. However, since the patient was 80 years old the possibility of waning immunity cannot be ruled out.

According to Uyegur *et al*, virulence of salmonella is different from staphylococcus species since local or systemic fever is usually not observed and similarly in our study patient was afebrile [6]. Acute arthritis caused by gram-negative bacilli usually occurs after instrumentation, trauma or as post infectious reactive arthritis but majority of cases are believed to occur by internal dissemination of bacteria [7-9]. In the present scenario, the point of entry for infection remains unknown.

Most patients with *Salmonella* septic arthritis usually have a predisposing factor like sickle cell anaemia, SLE, or a prosthetic joint or avascular necrosis [10-12]. But, in our study besides age factor, there were no comorbid conditions. Similar findings were also reported by Spencer *et al* [13]. Organisms which are commonly associated with septic arthritis include *Staphylococcus aureus*, *Haemophilus influenzae type B*, and *Streptococci*. *Salmonella* arthritis is infrequent and accounts for only 1% of all cases [14-15]. *Salmonella* is often considered to affect primarily the gastrointestinal tract; however infection at various other sites where they are hardly expected may also occur, producing characteristic clinical syndromes [16]. A case series by Reddy *et al* stated *Salmonella enteritidis* as a cause of septic arthritis knee but *Salmonella Typhi* causing septic arthritis knee is the first case report to the best of our knowledge [6].

This case was unique because, the Widal test was negative, the patient history did not reveal any significant fever in the preceding months, and the faecal culture to investigate carrier state or subclinical infection was non-contributory. Early diagnosis, surgical intervention and administration of appropriate systemic antibiotics plays a pivotal role in successful management.

4. Conclusion

Although Salmonella infections are endemic in India but pyogenic infection of joint is a rare presentation. Routine laboratory investigations including Widal test and blood culture may not be useful for diagnosis. The typical history of fever may be lacking in some of the individuals.

This case is reported to highlight the unusual presentation of *Salmonella* as a cause of septic arthritis knee and to create awareness amongst the Clinicians. This can help them to diagnose the infection at the earliest by which severe damage to the affected joint can be minimized by early and proper administration of antibiotics along with surgical intervention.

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