Moraxella osloensis: Septic Arthritis

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Abstract: Moraxella osloensis is a rare causative agent of infection in humans with most cases reported in immunocompromised patients. We report a case of 40 years old chronic alcoholic patient who presented with septic arthritis of left knee joint. Culture of pus aspirate was found to be positive for gram negative coccobacilli that were aerobic, oxidase positive and catalase positive. M. osloensis was identified by biochemical tests and Vitek 2 Compact. Prompt control of infection was achieved by treatment with Meropenem for 7 days along with debridement of left knee joint.

Keywords: Moraxella osloensis, coccobacilli, arthritis, immunocompetent, carbapenems.

INTRODUCTION
Moraxella osloensis is an aerobic gram negative coccobacilli infrequently isolated from clinical specimens. Because of its rare occurrence the clinical significance and antimicrobial therapy for patients with infection due to Moraxella osloensis is not well understood. We report a unique case of Moraxella osloensis septic arthritis in alcoholic patient with alleged history of fall following attack by a domestic animal.

CASE REPORT
A 40 year old man presented to orthopedic outpatient department with history of fall from a vehicle, with multiple injuries 1 month back after a drinking episode. He complained of fever since 10 days associated with pain and swelling of left knee joint. He had undergone surgery for fracture of left clavicle by plate and screwed. Clinical examination revealed swelling, tenderness and restriction of movements of left knee joint.

LABORATORY STUDIES REVEALED
Hb - 12.1 gm%, PCV - 36%, WBC - 13.300(N-84, L-11, E-03, M-02), ESR - 20mm/hr, CRP - 4.4 mg/dl (positive in 1:2 dilution). Platelet count - 3.35 x 10^5 cu mm. His Blood sugar, Serum creatinine, Serum Uric acid, Na+, K+ & Ca2+ levels were within normal range. His liver function tests were within normal range.

Pus aspirate obtained from left knee joint grew Moraxella osloensis – sensitive to Imipenem, Meropenem, Netilimicin and Cefaperazone+ Sulbactam. The organism was resistant to Penicillins, Cephalosporins other Aminoglycosides (Gentamicin, Amikacin), Cotrimaxazole, Piperacillin and Piparacillin+Tazobactam.

The patient remained symptomatic with pain in the left knee joint, swelling and tenderness despite therapy with IV Cefaperazone + Sulbactam 1.5 gm BD and IV Amikacin 500 mg BD for 7 days.

Repeat sample from the same site was requested and culture and sensitivity test was performed. Repeat culture also grew the same Moraxella osloensis organism with the same sensitivity pattern.
Table 1: Characters of the organism isolated from patients knee joint aspirate

<table>
<thead>
<tr>
<th>Tests</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gram’s staining</td>
<td>Gram negative coccobacilli in pairs, tetrads</td>
</tr>
<tr>
<td>Aerobic culture</td>
<td>Growth present</td>
</tr>
<tr>
<td><strong>Culture on:</strong></td>
<td></td>
</tr>
<tr>
<td>Blood agar</td>
<td>Mucoid grey non lytic colonies</td>
</tr>
<tr>
<td>Macconkey agar</td>
<td>No growth</td>
</tr>
<tr>
<td>Chocolate agar</td>
<td>Mucoid colonies</td>
</tr>
<tr>
<td><strong>Biochemical tests:</strong></td>
<td></td>
</tr>
<tr>
<td>Oxidase test</td>
<td>Positive</td>
</tr>
<tr>
<td>Catalase test</td>
<td>Positive</td>
</tr>
<tr>
<td>Indole test</td>
<td>Negative</td>
</tr>
<tr>
<td>Mannitol Motility medium</td>
<td>Mannitol not fermented non motile</td>
</tr>
<tr>
<td>Triple sugar iron medium</td>
<td>Alkaline slant/alkaline butt</td>
</tr>
<tr>
<td>Citrate test</td>
<td>Citrate not utilized</td>
</tr>
<tr>
<td>Urease test</td>
<td>Urease not produced</td>
</tr>
<tr>
<td>Vitek 2 - compact *</td>
<td>Moraxella group 99% confidence</td>
</tr>
<tr>
<td>Anaerobic culture</td>
<td>No growth</td>
</tr>
</tbody>
</table>

* Vitek 2 – compact (Biomerieux) is an automated system for bacterial identification and antibiotic susceptibility testing

Fig-1: Grams stain of pus aspirate showing gram negative coccobacilli

Fig-2: Blood agar showing grey non lytic mucoid colonies. There is no pitting seen
DISCUSSION

The genus *Moraxella* consists of pleomorphic gram-negative bacteria that are aerobic, oxidase positive, indole negative and assaccharolytic. *Moraxella* species are inhabitants of the environment as well as part of the normal flora of skin and mucosal surfaces. *M. osloensis*, *M. nonliquefaciens*, *M. catarrhalis* and *M. lincolnii* are part of the normal flora of the human respiratory tract [1]. *M. catarrhalis* is the most common species isolated from human sources and is responsible for infections such as otitis media, sinusitis and pneumonia [2]. Other species of *Moraxella* including *M.lacunata, M.atlantae, M.lincolnii, M.nonliquefaciens, M.oslensis* have been isolated from clinical sources [1].

*M. osloensis* is a rare causative agent of infections in humans with most cases reported in immunocompromised hosts [1]. Originally grouped with *M. nonliquefaciens* but was reclassified into its non-distinct species in 1967 [3]. *M. osloensis* is widely distributed in nature where it has been recovered from hospital environment [1]. *Moraxella osloensis* is an aerobic, oxidase positive, catalase positive gram negative coccobacilli found in infections associated with genito urinary tract, blood, spinal fluid, chest fluid and nose but seems to be rare in respiratory tract [4].

The characters that differentiates *Moraxella osloensis* from other species of *Moraxella* are that pitting on the agar is rare and colonies have a soft or coherent consistency and are unpigmented. This feature was characteristically seen in pus samples (aspirate) obtained from left knee joint of our patient.

Bacteria cause septic arthritis most often by haematogenous spread. Our patient had signs and symptoms resembling bacteremia i.e. fever, pain, tenderness, and swelling which showed prompt response following athrotomy, debridement and treatment with Carbapenem group of antibiotics. The patient continued to improve with eventual resolution of signs and symptoms. The prognosis for patients with *Moraxella osloensis* infections is generally good. Although it appears that infections due to *Moraxella osloensis* causes varying degrees of illness, there have been no reported fatalities attributable to infection with this organism.

Definitive identification of the isolate as *M. osloensis* by 16S rRNA gene sequencing has been reported as a useful method for correct identification. This method improves clinical and microbiological identification of poorly described organisms like *M.
*Moraxella osloensis*. With respect to treatment, Penicillin, Cephalosporin and Aminoglycosides are usually effective against *M. osloensis* [5]. In our case, the patient was initially treated with combination of injection Cefperazone – Sulbactam and injection Amikacin both BD for 7 days duration. Due to unfavorable response, Arthrotomy and debridement of the left knee joint was done after one week. Later repeat cultures from the same site yielded the same isolate with similar character and also the same sensitivity pattern. The patient was later treated with Meropenem 1gm BD for 7 days and patient showed good clinical response.

In conclusion, we report a case of monoarticular septic arthritis due to *Moraxella osloensis* in an chronic alcoholic patient. *Moraxella* septic arthritis is unusual and most frequently occurs in patients with underlying medical conditions such as arthritis or immunocompromised diseases [6].

We suggest that *M. osloensis* should be considered as a rare potential pathogen in immunocompetent individuals who present with clinical picture of monoarthritis, as this organism has been isolated from non immunocompromised patients and children with osteoarticular infection [7]. In view of a rapid and favourable clinical response shown by our patient, we advocate conservative management as the initial modality of treatment.

In summary, *M. osloensis* is a gram negative coccobacilli with potential to cause systemic diseases. Further studies are required to determine the epidemiology, risk factors, and appropriate treatment of infections due to *M. osloensis*

**REFERENCES**