Achromobacter xylosoxidans Septic Arthritis in a Child with Primary Immunodeficiency

Sir,

Achromobacter is a Gram-negative aerobic bacilli known to cause opportunistic infections in neonates and patients with HIV infection,[1] cancer,[2] cystic fibrosis,[3] and hyper-immunoglobulin M[4] syndrome. We report a case of *Achromobacter xylosoxidans* sepsis with septic arthritis in a child with suspected severe combined immunodeficiency (SCID).

A 2-year and 11-month-old male child presented with complaints of high-grade fever with swelling and restriction of movement of bilateral knee joints for 10 days. There was a history of multiple respiratory infections starting at 1 year of age, including an episode of empyema thoracis. Initial investigations revealed total leukocyte count 28,360 cells/mm^3, neutrophil 65%, lymphocyte 25%, monocyte 7%, eosinophils 3% (absolute neutrophil count = 18,434/mm^3 and absolute lymphocyte count = 7090/mm^3), and C-reactive protein 290 mg/dl. Bilateral knee aspirates revealed acute inflammatory exudate. The child was empirically started on injection ceftriaxone and cloxacillin; however, there was no response in 72 h.

On day 4, his initial blood culture and knee aspirates showed growth of *A. xylosoxidans*. All the isolates were sensitive to ceftazidime, ciprofloxacin, and levofloxacin and resistant to gentamicin, amikacin, ceftriaxone, and cotrimoxazole. The antibiotic was changed to ceftazidime. Patient's joint symptoms improved and he became afebrile within 7 days of starting ceftazidime, which was continued for 6 weeks.

In view of a history of recurrent respiratory infection and disseminated infection with an opportunistic pathogen, possibility of immunodeficiency was considered. HIV serology was negative. His immune globulin profile showed severe panhypogammaglobulinemia and lymphocyte subset study was suggestive of T^- NK^- B^+ SCID [Table 1].

Table 1: Immunoglobulin Profile and Lymphocyte Subset Analysis of the Patient

Immunoglobulin profile
IgA level: <10 mg/dl (14-159 mg/dl)
IgG level: <75 mg/dl (345-1236 mg/dl)
IgE level: <2 IU/ml (0-230 IU/ml)
Lymphocyte subset analysis by flow cytometry
T-cell markers
$CD3^+$: 21.2% (control 84.7%)
$CD4^+$: CD8+ratio: 0.97
B-cell marker
$CD45^+CD19^+$: 18.3% (control 16.9%)
NK-cell markers
$CD3^-CD56^+$: 0.56% (control 4.03%)
$CD3^-CD16^+$: 0.18% (control 26.5%)
$CD3^-CD56^+CD16^+$: 0.05% (control 21.3%)
Neutrophil oxidative index: 26.5 (control 7.1%)

Intravenous immunoglobulin was given as a replacement therapy for panhypogammaglobulinemia. The child was advised monthly intravenous immunoglobulin replacement therapy and cotrimoxazole prophylaxis. He was referred for genetic testing and stem cell transplant. Mother was advised carrier testing for genetic counseling to explain the risk in future pregnancy.

A. xylosoxidans infections are more common in immunocompromised hosts with indwelling catheters, endotracheal tubes, or other medical devices. It may disseminate and cause sepsis, meningitis, and death. It is a very rare cause of septic arthritis. *A. xylosoxidans* is found in water sources, and well water is considered to be the source of community-acquired infections and intravenous fluid, ventilator, or dialysis fluid in nosocomial infection. It is usually multiresistant to antimicrobial therapy.

SCID is most severe form of primary immune deficiency with a presentation in early infancy with recurrent infections and failure to thrive. Atypical or milder expression of SCID with genetic defects known to be associated with classical disease is reported.[5] Maternal T-cell engraftment is considered as a possible explanation for such atypical presentation.

To conclude, *A. xylosoxidans* is an emerging opportunistic pathogen. Although recurrent infections are common in children in developing countries, diagnosis of primary immunodeficiency should be considered in presence of severe, unusual, prolonged, or recurrent infections.

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Conflicts of interest

There are no conflicts of interest.

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References

1. Manfredi R, Nanetti A, Ferri M, Chiodo F. Bacteremia and respiratory involvement by *Alcaligenes xylosoxidans* in patients infected with the human immunodeficiency virus. Eur J Clin Microbiol Infect Dis 1997;16:933-8.
2. Tugcu D, Turel O, Aydogan G, Akcay A, Salcioglu Z, Akici F, *et al.* Successful treatment of multiresistant *Achromobacter xylosoxidans* bacteremia in a child with acute myeloid leukemia. Ann Saudi Med 2015;35:168-9.
3. Dunne WM Jr., Maisch S. Epidemiological investigation of infections due to *Alcaligenes* species in children and patients with cystic fibrosis: Use of repetitive-element-sequence polymerase chain reaction. Clin Infect Dis 1995;20:836-41.
4. Weitkamp JH, Tang YW, Haas DW, Midha NK, Crowe JE Jr. Recurrent *Achromobacter xylosoxidans* bacteremia associated with persistent lymph node infection in a patient with hyper-immunoglobulin M syndrome. Clin Infect Dis 2000;31:1183-7.
5. Frucht DM, Gadina M, Jagadeesh GJ, Aksentijevich I, Takada K, Bleesing JJ, *et al.* Unexpected and variable phenotypes in a family with JAK3 deficiency. Genes Immun 2001;2:422-32.

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