Diagnosis and Initial Management of Musculoskeletal Coccidioidomycosis in Children

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Introduction

- Coccidioidomycosis is an invasive fungal infection caused by inhalation of aerosolized spores of *Coccidioides* spp., which grow in and soil of the southwestern United States.
- Approximately 80% of all reported cases of coccidioidomycosis occur in Arizona, where the incidence has increased over the last decade.
- Primary coccidioidomycosis is asymptomatic in 60% of patients, the remaining 40% commonly present with vague flu-like symptoms.
- Hematogenous dissemination occurs in 1% to 5% of patients, and can lead to extrapulmonary manifestations including meningitis (most commonly), osteomyelitis, and skin and soft-tissue involvement.
- Musculoskeletal coccidioidomycosis is rare, and requires long-term medical therapy and often aggressive surgical debridement.
- There have not been any previous studies specifically examining musculoskeletal coccidioidomycosis in the pediatric population.

Purpose of study: To retrospectively examine musculoskeletal coccidioidomycosis and characterize the initial presentation and management of a disease in a population that has received little study as compared to adults.

Subjects and Methods

- Retrospective chart review of patients who were seen and treated at Phoenix Children’s Hospital from 1997 to 2010 for musculoskeletal coccidioidomycosis.
- Patients were included if they were under age 17, and had an ICD-9-CM discharge diagnosis code of at least one of the following: primary coccidioidomycosis (114.1), other forms of progressive coccidioidomycosis (114.3), and coccidioidomycosis, unspecified (114.9).
- Patients with only pulmonary disease or meningitis were excluded.
- Information gathered included patient age, gender, method of diagnosis, clinical presentation, serologic and microbiologic findings, and initial management.

Results

- Twenty children were identified, including 13 males and 7 females.
- The mean age was 12.3 (range, 2 to 17) at the time of diagnosis.
- Locations of infection included the foot and ankle (24%), knee (14%), spine (10%), forearm (10%), lower leg (7%) and other sites (26%).
- All patients complained of bone pain (100%) on presentation.
- 3 patients (15%) had pulmonary symptoms and 3 patients (15%) were febrile (≥38.1°C) on presentation.
- Only 2 patients (5%) had an initial white blood cell count >15x10^9/L.
- Surgical Debridement required – 40% (8 patients).
- All patients were treated with oral antifungal agents. Fluconazole was used in 15 patients (75%), itraconazole in 2 patients (10%), voriconazole in 2 patients (10%), and amphotericin B in 1 patient (5%).

Discussion

- This is the first study specifically examining disseminated musculoskeletal coccidioidomycosis in children.
- Although a primary pulmonary infection, all of these patients had musculoskeletal complaints as their primary presenting feature of disseminated coccidioidomycosis.
- Initial laboratory findings may be misleading, and accurate diagnosis may require a comprehensive approach, incorporating microbiologic, histopathologic, immunologic and radiographic evidence.
- The surgical burden of this disease in the pediatric population is significant, with nearly half requiring debridement.

Summary

- Our data demonstrate the importance of having a high level of suspicion in order to diagnose this infection and manage these children appropriately.
- Pediatric orthopaedic surgeons should consider this diagnosis when faced with a musculoskeletal infection in children from endemic areas or with a positive travel history.

Selected References