Coccidioidomycosis In Children Younger Than Two Years Of Age: A Retrospective Review

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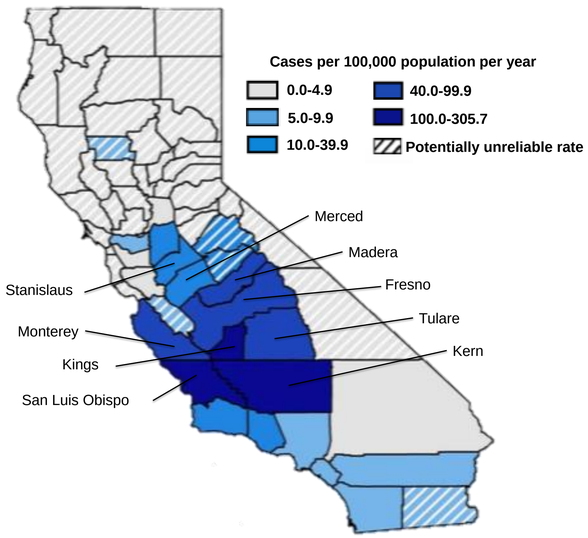
Background

- Coccidioidomycosis, an infection caused by the dimorphic fungi of the genus Coccidioides (C. *immitis* and C. *posadasii*), is endemic in the southwestern United States.
- In California, the highest rates of coccidioidomycosis are encountered in the San Juaquin River Valley. The disease burden in this area is substantial, especially among children.
- Coccidioidomycosis is associated with significant morbidity and healthcare utilization, particularly in patients in the extremes of age and patients with immunodeficiency or other comorbidities.
- Clinical manifestations range from self limited febrile illness to disseminated invasive disease.
- Published literature on the disease burden in infants and young children is limited.

Coccidioidomycosis Annual Incidence by County California 2017



CA Department of Public Health, Epidemiological Summary of Coccidioidomycosis in CA 2017 Published July 2018

Objectives

- Review the clinical manifestations, diagnostic methods, treatment and clinical outcome of coccidioidomycosis in infants and toddlers younger than two years of age at a large tertiary children's hospital in central California.

Methods

- Retrospective chart review of cases of coccidioidomycosis diagnosed in patients younger than 24 months of age at Valley Children's Hospital over a 10-year period; between 06/01/07 and 12/31/17.
- Categorical values were compared using Chi-square or Fisher exact tests.
- Continuous variables were expressed as median and interquartile range (IQR).

Results

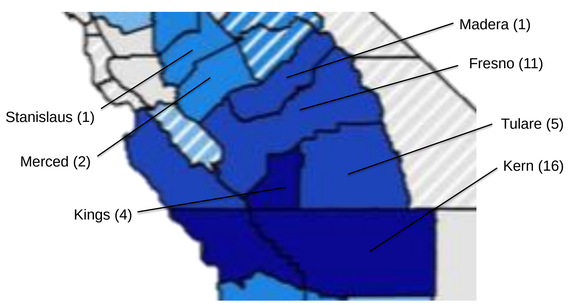
- Forty cases were identified during the study period.
- Patient's characteristics are summarized in Table 1.
- Clinical manifestations are summarized in Table 2.
- Treatment and outcome measures are summarized in Table 3.

Results

Table 1

Characteristics	N (%) = 40
Age: median, (IQR)	10.9 months, (5.3- 15.8)
Sex	
- Male	25 (63%)
- Female	15 (37%)
Ethnicity	
- Hispanic	32 (80%)
- Caucasian	7 (18%)
- African American	1 (2%)
County of Residence	
- Kern	16 (40%)
- Fresno	11 (28%)
- Tulare	5 (13%)
- Kings	4 (10%)
- Merced	2 (5%)
- Madera	1 (2%)
- Stanislaus	1 (2%)
Comorbid condition:	
- Healthy	37 (93%)
- Other (FTT, Prematurity, blood dyscrasia)	3 (7%)

Number of cases by county of residence



Number of cases by year of diagnosis

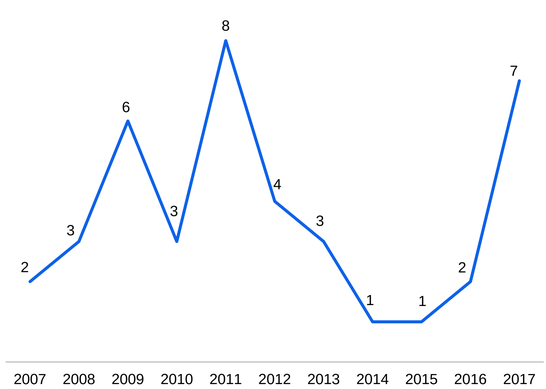
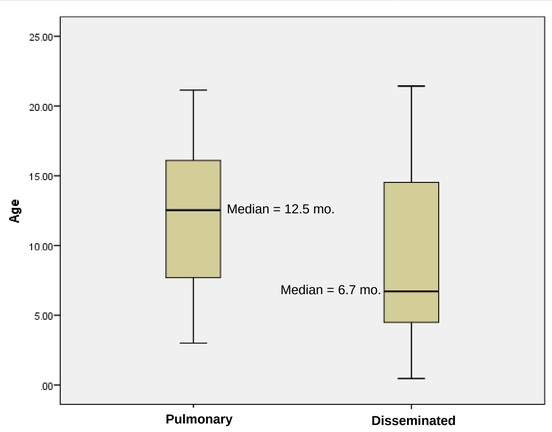


Table 2

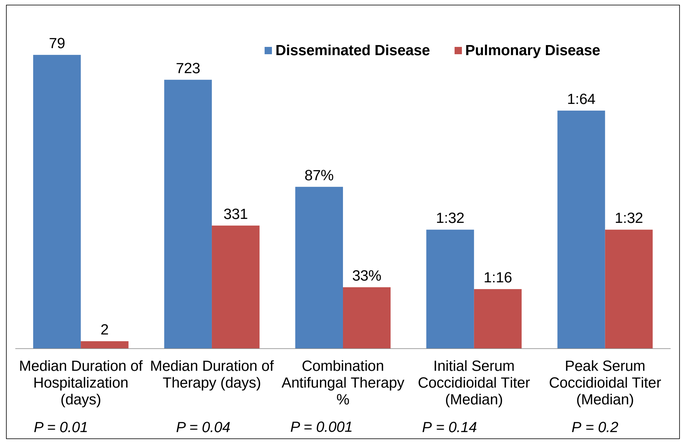
Clinical Manifestations	N (%) = 40
Symptoms	
- Fever	33 (83%)
- Cough	30 (75%)
- Fatigue	5 (13%)
- Erythema nodosum	4 (10%)
- Skin lesions (other than EN)	4 (10%)
- Night sweats	3 (8%)
Duration of illness: median, (IQR)	432 days, (234-802)
Simple Pulmonary Disease	19 (47%)
Complicated Pulmonary Disease	5 (13 %)
Extra-Pulmonary/Disseminated disease	16 (40%)
Extra pulmonary sites:	
- Bone and joint	5 (31%)
- CNS	4 (25%)
- Larynx	3 (19%)
- Skin	3 (19%)
- Cervical lymph nodes	1 (6%)
- Pericardium/SVC	1 (6%)

Table 3

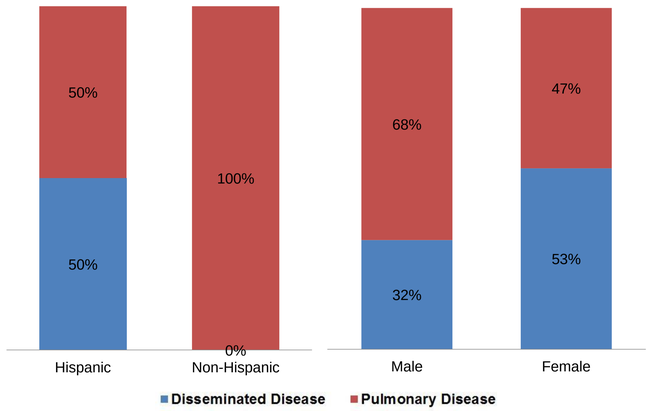
Treatment and Outcome	N (%) = 40
Antifungal therapy:	
- None	2 (5%)
- Monotherapy	16 (40%)
- Dual therapy	6 (15%)
- Triple therapy	6 (15%)
- More than 3 drugs	10 (25%)
Hospitalized:	
- No	10 (25%)
- Yes	30 (75%)
- Duration of hospitalization: median, (IQR)	16 days, (1-100)
Relapse:	
- Yes	2 (5%)
- No	38 (95%)
Final Outcome:	
- Resolved disease	30 (75%)
- Active, but stable	10 (25%)
- Progressive disease/Death	0



Patients with disseminated disease presented at a younger age than those with pulmonary disease alone (median 6.7 vs. 12.5 months, *P*=0.08)



Patients with disseminated disease had longer duration of hospitalization (median 79 vs. 2 days, *P*=0.01); and required longer duration of therapy (median 723 vs. 331 days, *P*=0.04); more frequently with combination antifungal therapy (87% vs 33%, *P*=0.001). However, the two groups did not differ in terms of initial (median 1:32 vs. 1:16, *P*=0.14) or peak serum cocci CF titers (1:64 vs 1:32, *P*= 0.2)



All patients with disseminated disease were Hispanic (*P*= 0.01), but there was no statistically significant difference between the two genders in terms of disease presentation or outcome results.

Conclusions

- Coccidioidomycosis in infants and toddlers younger than two years of age is associated with significant morbidity and health care utilization.
- Disseminated disease is frequently encountered in this age group.
- Work up for disseminated disease should be considered when formulating the plan for treatment and diagnostic investigations in this population.
- Further research efforts focusing on identifying other predictors of clinical outcomes in pediatric coccidioidomycosis are needed.

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