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SYSTEMIC REVIEW

Coccidiodomycosis: A systematic review of unusual case reports

Mohamed Qasim **Mohammed**

College of Medicine, University of Baghdad, Baghdad, Iraq

Abstract:

Background: Coccidioides immitis, a soil fungus that is native to the San Joaquin Valley of California, and C posadasii, a fungus that is endemic to specific arid-to-semiarid regions of the southwestern United States, northern portions of Mexico, and sporadic areas in Central America and South America, are both responsible for coccidioidomycosis. The most common way that coccidioidomycosis is spread is through airborne spores of C immitis or C posadasii.

Methods: It is a systematic review article that included 45 case reports in Coccidioidomycosis. The data was obtained from Medline and Google scholar which was then reviewed and read carefully. The data then was analyzed by the SPSS program version 25 for frequency and percentages.

Results: A total of 9 studies were selected out of 45 studies, because the others did not meet the standards and their data was incomplete. The ages of the patients in the cases ranged from 7–78 years. 7 of them were females and only 3 females. Their presentations were depending on the site of infection and some of them have a silent disease, especially in the lymph nodes. After treatment, all of them fully recovered except for one case of retroperitoneal dissemination which ended with death.

Conclusion: The infection known as coccidioidomycosis is typically brought on by breathing the spores of the fungus Coccidioides immitis or Coccidioides posadasii. In specific geographic places, such as several endemic US regions, these spores are found in the soil. Depending on the site of infection, but mostly in the lungs, it can cause a variety of symptoms and presentations.

Keywords: Coccidioidomycosis; Case reports; Disseminated disease; Clinical manifestations; Antifungals.

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Introduction

Coccidioides immitis, a soil fungus that is native to the San Joaquin Valley of California, and *C posadasii*, a fungus that is endemic to specific arid-to-semiarid regions of the southwestern United States, northern portions of Mexico, and sporadic areas in Central America and South America, are both responsible for coccidioidomycosis. The two species are identical morphologically despite being genetically diverse. [1].

The 2 species of Coccidioides show few immunologic variations, and the symptoms of infection with either organism are thought to be the same; however, this idea has not been formally confirmed. [2].The most common way that coccidioidomycosis is spread is through airborne spores of C immitis or C posadasii. [3,4].

Infected people typically contract the disease through outdoor activities in the summer or the late fall in places where it is endemic.The initial infection in most coccidioidal infection patients is in the lungs. This infection is asymptomatic in 60–65% of cases. [5].

Resolution typically occurs over several weeks (although fatigue may persist for months), and 95% or more of patients recoverwithout any further sequelae [6,7].

Corresponding author: Mohammad Qasim Mohammad
Affiliations: University of Baghdad, College of Medicine, Iraq.
Email: mohammedqasimmohammed3@gmail.com

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San Joaquin Valley fever (or just Valley fever) or desert rheumatism are terms used to describe a more complicated presentation that includes the constellation of fever, arthralgias, erythema nodosum or erythema multiforme, and chest pain.

Hematogenous spread is responsible for the majority of extrapulmonary disseminated infections. Rapid and deadly dissemination is a possibility. The peritoneal cavity, liver, kidney, prostate, eyes, endocrine glands, and soft tissues of the body can all be affected, but the Coccidioides species prefers the lungs, skin, meninges, soft tissues of the joints, and CNS. Meningitis is a serious side effect. [8].

Disseminated disease can strike a person who is generally healthy, although the risk is noticeably higher in those who have cellular immunity that has been compromised by illness (such as HIV infection or lymphoma), medication (such as corticosteroid therapy), or pregnancy.

Trauma from an infected instrument puncturing a wound can result in extrapulmonary primary infections. Children and laboratory workers are particularly vulnerable to developing chancres or other cutaneous or soft tissue diseases that are accompanied by regional lymphadenitis. [9].

The organism must be isolated in culture, identified on histologic samples, or detected through serologic testing for a diagnosis. The majority of Coccidioides infection patients are asymptomatic or have self-limited symptoms and simply need supportive care.[10].

The cornerstones of antifungal therapy for coccidioidomycosis are amphotericin and oral azoles. The duration of the infection's treatment is frequently lengthy, lasting anything from a few months and years, with some people needing permanent suppression. [11,12].

Materials and Methods

The search was done in the Medline database and Scholar through the Google search service for English language studies that presents unusual case reports of Cocciodiomycosis and unusual manifestations. The text words and related keywords and terms were used such as: Cocciodiomycosis, unusual case reports, Cocciodiomycosis infections, Cocciodiomycosis diseases and transmission. References of the reviewed articles were also searched for relevant titles. We executed and reported our findings according to the guidelines of the systematic review.

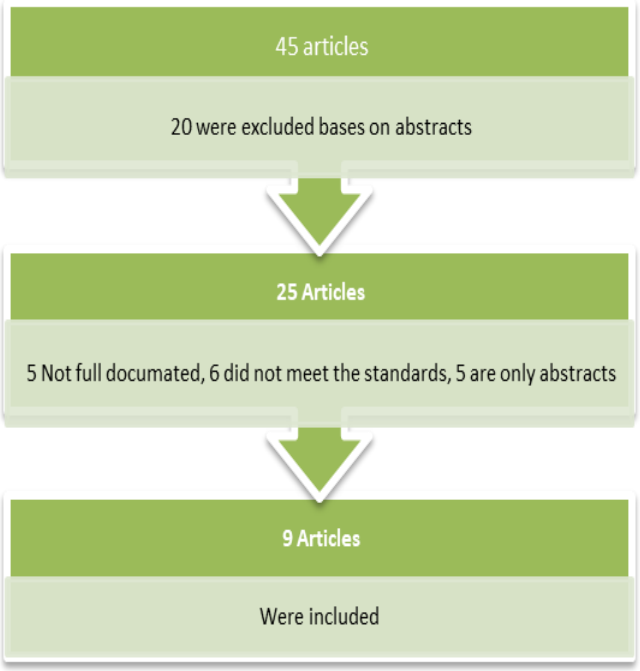
The articles were screened for appropriateness before retrieval of the articles. I included only the case reports and the reviews that presented unusual or new manifestations and infection sites for Cocciodiomycosis in humans.

The following data and information of the study was concluded: author, year, design, sample, size, the drugs, the amount, age, gender and case reports, site of infection, the manifestation and the treatment if applicable. All statistics were done by using Statistical Package for the Social Science (SPSS) program version 25.

Results

Results from the literature search are shown in Figure 1.

Figure 1: The flow gram of the selection process of the papers



Selected unusual cases of Cocciodiomycosis case report data is presented in Table 1 and Table 2

Table 1. Presents ten case reports data and the studies that have been selected as unusual cases of Cocciodiomycosis

Author	Site of infection	No. of cases	No.of cases in the literature	Year	Refer-enc-es
Chen et al	Prostate	1	9 cases	1985	[13]
Dykes et al	Epididymis	1	12 cases	2005	[14]
Ellis et al	Peritoneal coccidioidomycosis mimicking ovarian carcinoma	1	No previous case of peritoneal coccidioidomycosis has presented as an adnexal mass.	2004	[15]
Papadopoulos et al	Bilateral isolated adrenal coccidioidomycosis	1	No previous cases	1996	[16]
Taljanovic et al	Musculoskeletal Coccidioidomycosis	2	Accounting for 15% to 20% of cases	2011	[17]
Crum-Cianflone et al	Retroperitoneal	1	None	2006	[18]
Smith et al	lymph node	1	None	1994	[19]
Larsen et al	Respiratory failure	2	1 case	1985	[20]
Jamidar et al.	Peritoneal Coccidioidomycosis	1	2 cases	1992	[21]

Table 2. Demographic data of the patients and their other diseases associated with Cocciodiomycosis.

The cas	The age	The gender	The race or occupation	Travel history
1	-	Male	-	None
2	78 years	Male	White	USA
3	-	Female	-	None
4	43 years	Male	Caucasian	None
5	22 years 53 years	Male Female	Student Office worker	Arizona Chicago
6	7 years	Male	Black	None
7	76 years	Female	White	New
8	23 years 26 years	Males	Caucasian	California
9	42 years	Male	White	Southern Califor-

These cases were presented with different signs and symptoms and some of them (like lymph node Cocciodiomycosis) were silent and were diagnosed by biopsies.

Table 3. The clinical manifestation of the cases.

Case	Presenting symptoms	Duration of the symptoms	Medical or surgical history	Treatment	Outcomes
1	-	-	-	-	Full recovery
2	Painless, firm right scrotal mass on routine physical examination	-	History of benign prostate hypertrophy	Systemic antifungal therapy and surgical resection of infected scrotal contents	Survive
3	Ascites, omental caking, a complicated ovarian tumour, and an increased CA 125 were all present in the patient. At the staging laparotomy, frozen section histology was used to make the final diagnosis.	-	No previous history	-	-
4	Elevated plasma ACTH, anomalies in the mineralocorticosteroid and androgen pathways, and subclinical adrenal insufficiency were discovered.	-	Previously healthy and immunocompetent	Antifungals	Full recovery
5	Mild pain and swelling persisted in ankle. progressive bilateral lower extremity weakness and decreased sensation	6 months 1 month	Ankle surgery No history	Fluconazole for 14 months C	Full recovery
6	Abdominal distension	-	-	None	Died
7	In October 1992, the patient underwent screening mammography, which identified two nearby, clearly defined, benign-appearing nodular densities in the lower outer quadrant of the right breast, as well as nodular densities in the axillary regions on both sides that were consistent with small lymph nodes.	-	Excellent health	-	-
8	Cough and shortness of breath	8 days	Neither patient had any chronic medical illness	Intravenous amphotericin B	Nine months after discharge. He has not returned to his usual state of health.
9	History of increasing abdominal girth, anorexia, diarrhea, and general lethargy. He denied having fever, chills, night sweats, or weight loss	3 weeks	Jaundice and was found to have acute hepatitis A and to be positive for HIV-1 antibody by enzyme immunoassay.	Antifungals	Antifungal therapy prevented future buildup, and at the time of discharge, following many weeks of antifungal therapy, the ascites level had significantly decreased. He is still afebrile and has no clinically discernible ascites six months after being released.

The clinical manifestation of the cases and the outcomes after treatment and the treatment that was used for each case are presented in Table 3.

In areas of the United States where *C. immitis* is endemic, at least 50,000 new infections happen each year. These infections are typically self-limiting, immunocompetent patients, and may be asymptomatic or manifest with symptoms of the lower respiratory tract. Although widespread dispersion is rare, it can be dangerous and most frequently occurs in immunocompromised hosts.

Discussion

In areas of the United States where C. immitis is endemic, at least 50,000 new infections happen each year. These infections are typically self-limiting, immunocompetent patients, and may be asymptomatic or manifest with symptoms of the lower respiratory tract. Coccidioides infections are extra thoracic infections of the supraclavicular lymph nodes, bones, skin, meninges, and other sites.

Conclusions

The infection known as coccidioidomycosis is typically brought on by breathing the spores of the fungus Coccidioides immitis or Coccidioides posadasii. In specific geographic places, such as several endemic US regions, these spores are found in the soil.

It can produce a variety of symptoms and manifestations depending on the site of infection but predominantly in the lungs.

There are many rare or unusual cases that were reported in many regions of the world and I reviewed 9 cases of them for their importance.The treatment choices were antifungals like Amphotericin B and Fluconazole which are very effective.

Ethical approval and consent

The study was approved by the institutional board of studies.

Disclosure

The author reports no conflicts of interest.

Author's contributions

MQM was involved in the execution, design and writing of the manuscript.

Data availability

Available from the corresponding author on request.

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