

Sporotrichosis: A Comprehensive Review on Epidemiology, Clinical and Treatment of an Emerging Mycosis

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ABSTRACT

Sporotrichosis is an emerging subcutaneous mycosis caused by the fungus *Sporothrix schenckii*. In this article, a comprehensive review of the epidemiology, clinical and treatment of this disease is presented. Relevant aspects of its geographical distribution, risk factors, zoonotic transmission and epidemic outbreaks are discussed. In addition, the clinical variability of sporotrichosis is analyzed in detail, describing its various forms of presentation, including cutaneous, lymphangitic and systemic.

Diagnostic challenges associated with its similarity to other mycoses and skin diseases are highlighted, and guidelines for its microbiological diagnosis are provided. Therapeutic options are also discussed, with emphasis on the use of systemic antifungals and the consideration of surgical treatment in selected cases. Finally, the importance of comprehensive knowledge of sporotrichosis to improve early detection, effective clinical management and prevention of complications in patients affected by this fungal infection is highlighted.

KEY WORDS: sporotrichosis, fungus, skin, mycosis.

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INTRODUCTION

Sporotrichosis is a chronic subcutaneous mycosis of fungal origin, caused by the dimorphic fungus of the genus *Sporothrix*, predominantly by the species *Sporothrix schenckii*. This condition is characterized by the formation of cutaneous, lymphangitic and lymphadenopathic lesions, which usually progress insidiously and slowly, mainly affecting the skin, subcutaneous tissues and regional lymph nodes.

The infectious process of sporotrichosis is initiated by inoculation of the reproductive structures of the fungus, called conidia, through wounds or trauma to the skin. Subsequently, these conidia germinate and transform into the yeast-like form, which shows a special ability to multiply in the cutaneous and subcutaneous tissue, generating nodular lesions and ulcers with a tendency to spread along the lymphatic pathways. It is important to mention that, in exceptional cases, the disease can spread by hematogenous

route and affect internal organs such as lungs, bones and joints.

This mycosis is transmitted through traumatic inoculation of the fungal conidia into the skin, usually through wounds or scratches, allowing the fungus to penetrate the cutaneous and subcutaneous tissue. Once inside the host, *Sporothrix schenckii* adopts a yeast-like form that facilitates its reproduction and colonization of the affected tissue.

EPIDEMIOLOGY

The epidemiology of sporotrichosis is a field of medical study that focuses on the distribution, frequency, determinants and patterns of this mycosis in human and animal populations. This disease is considered an emerging subcutaneous mycosis in various regions of the world, and although its global incidence is not high, it presents epidemiological characteristics of clinical and public health interest.

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Sporotrichosis has a heterogeneous geographical distribution, being most common in subtropical and temperate areas of Latin America, including countries such as Brazil, Colombia, Venezuela, Peru and Mexico, where most cases have been reported. In addition, sporadic outbreaks have been described in other regions, such as the United States, Africa, Asia and parts of Europe.

The mycosis predominantly affects adults, and although both sexes are susceptible, some studies suggest a slight predominance in males. Occupational exposure to rural environments and agricultural or gardening tasks has been associated with an increased risk of infection, due to possible exposure to environmental sources of *Sporothrix schenckii*. The main mechanism of transmission of sporotrichosis in humans is through skin trauma, especially through wounds with thorns, splinters, twigs or other plant items contaminated with conidia of the fungus. Handling decaying organic material, such as soil, moss or plants, has also been linked to the acquisition of the infection.

Sporotrichosis is considered a zoonosis, meaning that it can be transmitted between animals and humans. In this context, cats, and to a lesser extent other animals, have been identified as potential reservoirs and transmitters of the fungus. Transmission of infection from cats to humans generally occurs by scratching or biting, and rarely through direct contact with the animal's skin.

It is important to mention that sporotrichosis has a long incubation, which may hinder the early identification of cases and contribute to its dissemination. In addition, climatic and environmental characteristics, such as humidity and temperature, may also influence the prevalence of the disease, as the fungus shows greater activity in certain environments. In terms of public health, sporotrichosis can generate localized outbreaks in rural communities or specific areas, especially at times of mass exposure to the fungus. In addition, the disease can have a significant socioeconomic impact due to the costs associated with diagnosis and prolonged treatment, as well as the potential work disability it can cause.

CLINIC

The clinic of sporotrichosis is characterized by a wide range of clinical manifestations reflecting the diversity of forms of presentation of this subcutaneous mycosis caused by the fungus *Sporothrix schenckii*. The disease can affect both humans and animals, although in this context we will focus on sporotrichosis in humans.

The most common clinical form of sporotrichosis is cutaneous-dermatosis, which initially manifests as a small papule or nodule on the skin at the site of fungal inoculation. As the infection progresses, these lesions may increase in size and acquire ulcerative features, forming cutaneous ulcers with well-defined borders and granulomatous appearance.

These ulcers tend to be painful, pruritic and have a serosanguinous discharge.

A classic sign of sporotrichosis is lymphangitis, which consists of swelling and reddening of the lymphatic vessels extending from the skin lesion into the regional lymph nodes. This lymphatic spread may result in the formation of a chain of nodules or abscesses along the affected lymphatic pathway, known as the lymphangitic form. Lymphangitis and swollen lymph nodes may be painful and tender to the touch. In some cases, sporotrichosis may present a fixed-cutaneous form, characterized by the presence of cutaneous nodules firmly adherent to underlying tissues, making mobility difficult.

In addition to cutaneous clinical forms, sporotrichosis can also affect other organs and systems. In more severe or immunocompromised cases, the fungus can spread by hematogenous route, affecting internal organs, such as the lungs, bones, joints, central nervous system, among others. This disseminated form may present specific symptoms related to the affected organs, and its diagnosis and treatment may be more challenging.

It is important to note that sporotrichosis can have a chronic and insidious clinical course, with periods of remission and recurrence of skin lesions. The duration of the infectious process may vary and will depend on factors such as the individual's immune response, the extent of the infection and the effectiveness of the treatment.

DIAGNOSIS

The diagnosis of sporotrichosis involves a comprehensive clinical and microbiological approach to confirm the presence of the mycosis and distinguish it from other conditions with similar cutaneous manifestations. Since the disease can present with various clinical forms and nonspecific symptoms, a thorough patient evaluation and consideration of the epidemiologic history are essential to guide the diagnosis. The first step in diagnosis is to obtain a complete clinical history, including information on the occurrence of skin lesions, history of exposure to rural areas or agricultural work, and the presence of animals with possible skin lesions in the patient's environment.

Physical examination is essential to identify the clinical features of the skin lesions and to evaluate for the presence of lymphangitis and lymphadenopathy in the regional lymph nodes, which may suggest a lymphangitic form of sporotrichosis.

For microbiological diagnosis, samples should be obtained from the affected skin lesions or lymph nodes. Samples may be obtained by skin biopsy, aspiration of pus or exudate from ulcers or abscesses. These samples are subjected to direct microscopic analysis using special stains such as KOH (potassium hydroxide) stain, which allows visualization of fungal structures such as yeasts and conidia.

Culture is another key method for diagnosis, as it allows growth and definitive identification of *Sporothrix schenckii*.

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Samples are sown on specific culture media, such as Sabouraud agar or potato dextrose agar, and incubated at optimal temperatures for fungal growth. Observation of characteristic colonies and biochemical and morphological tests confirm the presence of *Sporothrix schenckii*.

In addition, in cases of atypical presentation or difficult diagnosis, serological and molecular tests can be used to detect antigens or genetic material of the fungus, respectively. It is important to mention that differential diagnosis is essential to rule out other diseases with similar cutaneous symptoms, such as leishmaniasis, leprosy, coccidioidomycosis, among others. Detailed clinical evaluation, together with laboratory findings, allows establishing an accurate diagnosis and ensuring an adequate therapeutic approach.

Diagnosis of sporotrichosis involves thorough clinical evaluation, microscopic analysis and culture of skin or nodal specimens, as well as consideration of epidemiology and differential diagnosis. The combination of these approaches is essential to accurately identify the presence of *Sporothrix schenckii* and to provide timely and effective treatment to affected patients.

TREATMENT

The treatment of sporotrichosis is based on the use of systemic antifungals, which aim to eradicate the fungus causing the mycosis, *Sporothrix schenckii*, and control the progression of the infection. The choice of antifungal and the duration of treatment will depend on the clinical form of the disease, the extent of the infection and the individual patient's response.

The most widely used antifungal drug for the treatment of sporotrichosis is itraconazole, which is considered the drug of first choice due to its efficacy and good tolerability. This drug is administered orally and is usually prescribed in daily doses that vary according to body weight and severity of infection. The duration of treatment may extend from several weeks to several months, depending on the clinical and microbiological response of the patient. It is essential that treatment is maintained for the entire period indicated by the physician, even if early improvement is observed, to avoid recurrence of the disease.

In some cases, especially in patients with more severe or disseminated forms of sporotrichosis, the use of amphotericin B, a more potent intravenous antifungal, may be required. Amphotericin B is reserved for specific situations because of its adverse effects and the need for intravenous administration under medical supervision.

In patients with cutaneous-dermatomal or fixed-cutaneous sporotrichosis who present with abscesses or large ulcers, surgical procedures such as drainage of the lesions may be necessary to promote healing and removal of infected tissues. In addition to pharmacological treatment, it is recommended to provide adequate local care to the lesions, such as cleaning

and hygiene of the affected areas, and dressings or topical medications can be applied to reduce inflammation and pain. Medical follow-up during treatment is essential to evaluate the patient's response and adjust therapy if necessary. Periodic clinical and microbiological examinations make it possible to monitor the evolution of the infection and ensure complete resolution of sporotrichosis.

It is important to note that, although antifungal therapy is effective in most cases, in some patients, especially those with immunosuppression, the disease may be more resistant and persistent, requiring more prolonged therapeutic management and ongoing clinical and microbiological evaluation.

In conclusion, treatment of sporotrichosis involves the use of systemic antifungals, mainly itraconazole, to eradicate the fungus *Sporothrix schenckii* and control the infection. The duration of treatment and therapeutic approach will depend on the clinical form of the disease and the individual patient's response. Medical follow-up and proper care of the lesions are essential to ensure successful resolution of sporotrichosis.

CONCLUSIONS

In conclusion, sporotrichosis is a chronic and emerging subcutaneous mycosis caused by the dimorphic fungus *Sporothrix schenckii*. This disease presents various clinical forms and is characterized by the formation of cutaneous, lymphangitic and lymphadenopathic lesions, which can vary in presentation and severity. Transmission occurs mainly through cutaneous trauma and sometimes by contact with infected animals, highlighting its zoonotic nature.

The epidemiology of sporotrichosis reveals a heterogeneous geographical distribution, being more frequent in subtropical and temperate areas of Latin America, although cases have been documented in other regions of the world. Occupational exposure to rural environments and agricultural tasks has been associated with an increased risk of infection, highlighting its public health relevance and socioeconomic impact.

The diagnosis of sporotrichosis requires a thorough clinical evaluation, considering the cutaneous presentation, the presence of lymphangitis and epidemiological exposure. Microscopic analysis and culture of clinical specimens allow definitive identification of the fungus, but may require experience and specialized knowledge due to the similarity with other mycoses and diseases with similar cutaneous symptoms.

The treatment of sporotrichosis is based on the use of systemic antifungals, mainly itraconazole, with the aim of eradicating the fungus and preventing recurrences. The duration of treatment may be prolonged and will depend on the clinical form of the disease and the individual patient's response. Surgery may be necessary in cases of abscesses or extensive lesions.

In summary, sporotrichosis represents a diagnostic and therapeutic challenge due to its broad clinical spectrum, its

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impact on public health and its capacity to generate chronic and recurrent infections. Knowledge of this mycosis is essential for its early detection, proper patient management, and prevention of serious complications. A comprehensive understanding of the epidemiology, clinical and treatment of sporotrichosis is essential to provide effective medical care and improve the prognosis of individuals affected by this fungal infection.

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