

Cutaneous Sporotrichosis: experience of tertiary care hospital in Cali, Colombia

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ABSTRACT

Introduction: Sporotrichosis is a subcutaneous mycosis caused by the *Sporothrix schenckii* species complex which is acquired by a traumatic inoculation of the fungus.

Objective: To describe the epidemiological and clinical aspects of patients with sporotrichosis. **Methodology:** A descriptive, retrospective study was carried out in a referral hospital in the city of Cali between January 2000 and June 2011; laboratory records were used to select patients who had a positive culture for *S. schenckii* and/or staining with periodic acid-Schiff (PAS)-diastase positive for blastoconidias compatible with this complex.

Results: The group consisted of 20 men and three women. Eight (34,8%) of them were employed in agriculture while four (17,4%) worked in construction; six (26,1%) were children under 15 years of age. *S. schenckii* was isolated in 22 (95,7%) patients and 15 of 21 (71,4%) showed blastoconidias on direct examination. There were 14 (60,9%) cases of the lymphangitic form and nine (39,1%) of the fixed. The disease was present in the upper extremities of 16 (69,6%) patients, in the lower extremities of four (17,4%) and in the face of three (13%). Twenty-two (95,6%) of the patients were treated with potassium iodide.

Conclusions: Lymphangitic sporotrichosis was found to be the most common clinical form in this study. The PAS-diastase staining proved to be useful in the diagnosis of disease.

KEY WORDS

Colombia; Epidemiology; Sporotrichosis; Sporothrix schenckii; Subcutaneous Mycoses.

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RESUMEN

Introducción: la esporotricosis es una micosis subcutánea causada por especies del complejo *Sporothrix schenckii*, que se adquiere por la inoculación traumática del hongo.

Objetivo: describir los aspectos epidemiológicos y clínicos de un grupo de pacientes con esporotricosis.

Metodología: se realizó un estudio retrospectivo, descriptivo en un hospital de referencia de la ciudad de Cali, entre enero de 2000 y junio de 2011; de los registros de laboratorio se seleccionaron los pacientes que presentaron cultivo positivo para *S. schenckii* y/o tinción con ácido periyódico de Schiff (PAS)-diastasa positiva para blastoconidias compatibles con las de este complejo.

Resultados: el grupo estuvo formado por 20 hombres y 3 mujeres; ocho (34,8%) de ellos se desempeñaban en la agricultura y cuatro (17,4%), en la construcción; seis (26,1%) fueron niños menores de 15 años. En 22 (95,7%) se aisló *S. schenckii* y 15 de 21 (71,4%) mostraron blastoconidias en el examen directo. Hubo 14 casos (60,9%) de la forma linfagítica y nueve (39,1%) de la fija. La enfermedad se presentó en las extremidades superiores en 16 (69,6%) pacientes, en las inferiores en cuatro (17,4%) y en la cara en tres (13%). Se hizo tratamiento con yoduro de potasio en 22 pacientes (95,6%).

Conclusiones: la esporotricosis linfagítica fue la forma clínica más común en este estudio. La coloración de PAS-diastasa mostró ser útil en el diagnóstico de la enfermedad.

PALABRAS CLAVE

Colombia; Epidemiología; Esporotricosis; Micosis Subcutáneas; *Sporothrix Schenckii*

INTRODUCTION

Sporotrichosis is a sub-acute or chronic fungal infection caused by dimorphic fungi within the *Sporothrix schenckii* complex that mainly affects the skin, subcutaneous tissue and regional lymph nodes (1,2). The disease occurs in persons of all ages, both men and women, who perform work that is conducive to traumas, such as farming, gardening

and others. It has also been associated with insect bites and bites or scratches from cats and other animals (3,4). The most common clinical forms are lymphocutaneous or lymphangitic that involves lymph nodes with the development of a chain of nodules, and fixed cutaneous with a single lesion located at the site of the inoculation without apparent lymphatic spread (1). The incidence of sporotrichosis is high in tropical and subtropical areas of Latin America, South Africa, India and Japan (5).

In Colombia, there are few reports of this disease (6-8) and most of these relate to research conducted in Medellín (6,7); such work has not been carried out in the city of Cali and therefore it was considered important to undertake this study to describe the epidemiological and clinical aspects of patients with sporotrichosis diagnosed in the Mycology Laboratory of the University Hospital of Valle (HUV) between January 2000 and June 2011. The University Hospital is located in Cali, Colombia and it is a referral center for all Southwestern Colombia.

METHODS AND MATERIALS

A retrospective, descriptive study was carried out. From the records of laboratory samples, all patients who had a positive culture for *S. schenckii* and/or by direct examination blastoconidias compatible with this agent were selected. Information concerning demographic and clinical variables that included: age, sex, occupation, origin, evolution, topography of the lesion and treatment was obtained from clinical histories. The study was approved by the Ethics Committees of the University of Valle and the HUV.

All samples for the analysis arrived at the laboratory in Stuart agar (Oxoid, UK) with a test request form that included the presumed diagnosis. Direct examinations were performed using periodic acid-Schiff (PAS)-diastase and 20% potassium hydroxide (KOH). Cultures were carried out in 2% Sabouraud dextrose agar and Mycosel (BBL™, USA) and were incubated at 25° C. Dimorphism was confirmed in all isolates using brain-heart infusion (BHI) (BBL™, USA) agar at 37° C.

STATISTICAL ANALYSIS

The information was entered into a database using SPSS Data Documents and the analysis was carried

out with SPSS version 15.0 (SPSS Inc., Chicago IL). A univariate analysis was performed; the data were presented as measures of central tendency and dispersion, absolute frequencies and percentages.

RESULTS

Twenty (87%) men and three (13%) women diagnosed with sporotrichosis were studied (male/female ratio: 6,7/1); the age range varied between 1 and 75 years with a median of 23 years. Six (26,1%) patients were children less than 15 years of age (table 1). The culture

was positive for *S. schenckii* in 22 (95,7%) cases with growth between three and five days, and the identification was based on the characteristics of the colony (figure 1), microscopic examination (figure 2), and growth at 37° C. In one patient *S. schenckii* was not isolated; instead, *Candida non albicans*, which grows at a faster rate, was cultured. However, the disease was confirmed using PAS staining that showed elongated and oval polymorphic blastoconidias. Fungal structures were found on direct examination only in 15 of 21 (71,4%) individuals.

Table 1. Distribution of patients according to age group and sex

Age Group (years)	Gender		Total n (%)
	Male n (%)	Female n (%)	
1-9	1 (4,3)	2 (8,7)	3 (13,0)
10-19	4 (17,4)	1 (4,3)	5 (21,7)
20-29	4 (17,4)	-	4 (17,4)
30-39	1 (4,3)	-	1 (4,3)
40-49	2 (8,7)	-	2 (8,7)
50-59	1 (4,3)	-	1 (4,3)
60-69	4 (17,4)	-	4 (17,4)
70-79	3 (13,0)	-	3 (13,0)
Total	20 (87,0)	3 (13,0)	23 (100,0)



Figure 1. Glabrous moist, tan colored colonies

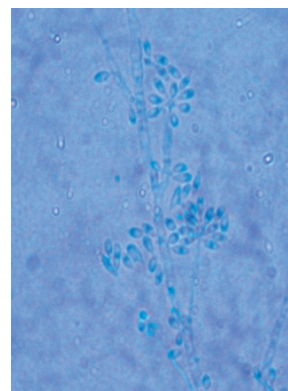


Figure 2. Preparation with lactophenol blue that shows microconidia arranged around the conidiophore giving a daisy aspect (100X)

Staining with PAS was not done for two patients but instead direct examination with 20% KOH was used because the presumptive diagnoses differed from sporotrichosis. Eight (34,8%) patients worked as farmers, four (17,4%) in construction, and three (13%) had other trades (driver, watchful, seller); the remaining eight (34,8%) were students and children under 5 years of age.

Of the 23 patients, 10 (43,5%) had experienced trauma with different agents: knife or glass, plant material including wood, one (4,3%) had an insect bite and one (4,3%) did not recall any antecedents of trauma. In the clinical records of the remaining 11 (47,8%), the previous history was not specified

Table 2 shows that the lymphangitic form presented in 14 (60,9%) of the patients and that the most affected body area was the upper limbs (69,6%). In the six children under 15 years of age, there were three cases of lymphangitic form and three of the fixed form that affected a finger and elbow (three cases), the face (two cases) and the knee (one case). Lesions were characterized as nodular (47,8%), ulcerative (26,1%), verrucous (13%), crusting (8,7%) or desquamativa (4,4%). The duration of the disease was from seven days to four years, 17 (73,9%) patients consulted after a six month period.

Table 2. Frequency of clinical forms of cutaneous sporotrichosis according to age and anatomical site

Clinical Form	Anatomical Site			Total n (%)
	Upper Extremities n (%)	Lower Extremities n (%)	Face n (%)	
Lymphangitic				14 (60,9)
< 15 años	2 (8,7)	-	1 (4,3)	
≥ 15 años	11 (47,8)	-	-	
Fixed				9 (39,1)
< 15 años	1 (4,3)	1 (4,3)	1 (4,3)	
≥ 15 años	2 (8,7)	3 (13,0)	1 (4,3)	
Total	16 (69,6)	4 (17,4)	3 (13,0)	23 (100,0)

Of the 23 individuals, 18 (78,3%) were primarily from Valle de Cauca, mainly from the city of Cali (14; 77,8%); three (13,1%) came from the department of Cauca, one (4,3 %) from Nariño and one (4,3%) from Quindío.

Treatment using potassium iodide (KI) oral drops was administered in 22 (95,7%) patients, with a gradual increase in dosage until the optimal level in three divided dosages was reached. A clinical cure was described for three of them, but the results are unknown for the remaining 19. Only one patient received itraconazole 200 mg/day orally for six months with complete resolution of the lesions.

DISCUSSION

Sporotrichosis is the most important subcutaneous mycosis in Colombia with a prevalence rate between

0,1% and 0,5% (5). The department of Valle del Cauca, located in the southwest of the country, presents environmental conditions like temperature, humidity and altitude that favor the development of the *S. schenckii* species complex (9).

The culture is the best method for establishing a definitive diagnosis of this mycosis as found in this study where the fungus was isolated in 22 of the 23 patients (95,7%). This percentage is greater than that reported in some other national studies (87% and 88,5%) (7,8) and similar to that found in other studies (94% and 96%) (10,11). Although culture is the standard of reference, sensitivity can be affected by bacteria or fungi that colonize the affected site, as seen with a patient whose culture grew a *Candida* species different than *C. albicans*, a circumstance which impeded the isolation of *S. schenckii*.

Because of their size and scarcity, the blastoconidias are difficult to observe with KOH preparations; however, they can be readily viewed using the histological staining PAS (12) when searching for a diagnosis. The HUV uses this stain on samples with a presumed diagnosis of sporotrichosis which are initially treated with diastase (a amylase) to digest the polysaccharide layer surrounding the yeast (1) and enable it to react with periodic acid. The 71,4% of the cases were positive with PAS staining unlike other studies reporting figures between 2% and 2,7% (8,13) while studies have also reported greater frequencies, between 89,1% and 94,6% (11,14). None of these studies specified the use of diastase. The procedure of digestion with diastase followed by staining with PAS proved to be useful for displaying blastoconidia and establishing a presumptive diagnosis of sporotrichosis as happened with the patient with negative cultures.

The disease occurred in a high percentage of men (87%) which is consistent with data from various publications: between 62,7% and 75% (6-8,11,15,16); which is probably due to the occupational activity favoring trauma. In this series, most of the men were employed in agriculture (34,8%) or construction (17,4%), results similar to those of Rubio and colleagues (8) that reported these activities between 25% and 8,3% respectively. Other studies have found more cases among women: between 52% and 67,5% (10,14,17) due to the degree of engagement in farming by those from rural areas. The three patients in the study were two girls under 5 years of age and a student, therefore, occupation was not the factor that triggered the mycosis. *S. schenckii* has also been isolated from insects that act as mechanical vectors (3); inoculation of the fungus is facilitated by scratching and, in this study, one patient that was referred for an insect bite that resulted in a papule and that subsequently became ulcerated.

Most patients in this series were adults between 21 and 75 years which is attributes an increased occupational exposure as several researchers have reported (10,11,17). There were six (26,1%) cases in children under 15 years, while the proportion of this age group in other publications has been variable: 12,6%, 20% (8,13), 45% and 60% (18,19). In children,

outdoor activities and farm work increases the risk of contact with the fungus (19). None of the children in the study had a history of working or of having had an insect sting, animal bite or scratch, so it is conceivable that the outdoor games have facilitated the traumatic inoculation with material containing the fungus.

The most frequent clinical form of sporotrichosis is lymphangitic with percentages ranging between 56.7% and 82% (10,15-17,20,21) as was found in this study, 60.9%. In Colombia, Rubio and colleagues (8) obtained similar data; however, the fixed form predominated in other national studies (6,7). The frequency of the disease is attributed to several factors including: 1. The immune status of the host: the fixed form is related to development of immunity, unlike that which happens with lymphangitic with those who have not been in contact with the fungus; 2. The inoculum size, 3. The depth of the trauma and 4. The thermotolerance of the species of the *S. schenckii* complex that will develop the lymphangitic variety while the fixed type associates with less thermotolerant isolates (3,22).

In both children and adults the lesions occurred more frequently in the upper extremities, as other studies have reported (7,8,10,12,23). In children, the face was the second most common site affected, but it has been reported as the most common location (18). These parts of the body by being more exposed have a greater risk of receiving trauma.

Currently itraconazole is the drug of choice for treating cutaneous sporotrichosis (24); however, patients in this study received potassium iodide because of its low cost and high efficiency as evidenced in several studies (11,13,15,21). Due to the high percentage of loss during follow-up, the therapeutic response could not be determined, but one might consider that improvements or distances traveled were contributing factors. For the side effects produced by KI, itraconazole was prescribed for a patient with a thyroid gland disorder. Despite itraconazole generally being the antifungal of first choice, in some endemic regions of developing countries KI is routinely used, except in cases of poor response or contraindication as was the case with this patient.

In vitro studies have shown that the species in the *S. schenckii* complex have different sensitivity profiles

to antifungal therapies (25), so that the identification of species is important for the choice of appropriate medications. Methods based on molecular testing and phenotypic characteristics like the morphology of conidia, growth at various temperatures, and assimilation of carbohydrates permit the identification of these new species (2,3). The knowledge we now have of the *S. schenckii* complex and the different behavior of some isolates to antifungal therapy makes it necessary to conduct molecular biological studies in Colombia to differentiate them. This will further help identify the species circulating in different regions and establish the respective sensitivity profiles.

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CONFLICT OF INTEREST

The author declares to not have any conflict of interest with this manuscript.

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