

## Community Dermatology

### **Subcutaneous mycosis and community dermatology**

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### **Introduction**

Subcutaneous mycoses are among the skin diseases with the greatest morbidity in rural areas in Guerrero Mexico. Our state is located along the Pacific coast in the southwest of the Mexican Republic; a major feature is the huge range of the “Sierra Madre del Sur” mountains, that cross the full length of the state. Guerrero is divided into seven natural regions (Figure 1). It has a temperature that ranges from 5 to 12° C in the mountain areas to 38-42°C on the coast and “Tierra caliente” region.

Mycetomas followed by sporotrichosis comprise almost 90% of all subcutaneous mycosis in this area of the country (1). The cases seen at the General Hospital as well as the ones presenting in the communities have great relevance due to the severity of the clinical manifestations rather than their frequency. Paracoccidioidomycosis and chromomycosis are two less frequent subcutaneous mycoses but still pose a difficult medical challenge due to their clinical appearance leading potentially to disfigurement and morbidity.



Figure 1: Map of Guerrero State with its seven regions

Other deep mycoses like histoplasmosis have also been reported (2) and in our state caves, populated by numerous bats in whose excreta, the infective spores are incubated, make a suitable environment for exposure to the disease. Poverty, ignorance and isolation of remote rural communities that mainly affected are the factors that exacerbate their morbidity. One of the goals of the Community dermatology program (3) is to search, study, treat, and control affected patients with complex disease such as deep mycoses. Many of these patients do not receive proper medical treatment for their diseases due to ignorance, lack of resources or even fear of leaving their communities; often the language is a local ethnic dialect, and patients rarely leave their hometown or village.

## Materials and Methods

The major subcutaneous mycoses in our state are reported. This followed a review of records from 2001 to 2010 including patients detected during visits to rural areas at the program Community Dermatology C.A. and others from the dermatological consultation at Acapulco General Hospital.

The community dermatology programme has been described elsewhere (3) but it involves a regular series of jornadas or teaching and clinic sessions carried out in different parts of the state. It is run by local dermatologists but carries support of the state of Guerrero and assistance is provided by dermatologists from Acapulco as well as others from different parts of Mexico. It also provides a training experience for residents in dermatology.

## Results

Results are described separately below, even though they share clinical and physiopathological characteristics.

## Eumycetomas

Our states as well as Morelos are among the main sources of mycetoma (4). Eumycetomas in Mexico have a low (2.5%) frequency compared with the remaining 97.5% which are

actinomycetomas, with a rate of 9% compared with the 3% national (5). It is worth mentioning that the main source is the “Costa chica” area in the Southern part of Guerrero.

Out of 19 cases, 17 were caused by dematiaceous (dark) fungi, only 2 by non-pigmented (hyaline) organisms. The most frequent species in this area, as well as in other areas in the world, is *Madurella mycetomatis* (6,7) and only one was caused by *Madurella grisea*; the two hyaline fungi were *Scedosporium apiospermum* and the second is still under investigation as it appears to be a previously unknown species. In all cases direct examinations, biopsies and cultures were conclusive for the identification and diagnosis. In most of the cases the extent of the area affected was wide and there was bone involvement in 10 cases.

Itraconazole and fluconazole, were the only systemic antimycotic available, and were used in all cases, with a variable response. Most of the patients lack sufficient economic resources to pay for these medicines. Therefore, treatment is frequently interrupted or some cases are lost to follow up as there is inadequate social and medical aid to help them get their medications over a long term.

### **Sporotrichosis**

It is caused by the dimorphic fungus *Sporothrix schenckii*. It is found as a saprophyte in nature. The infection is most frequent on the face and extremities. The two main clinical forms are the lymphangitic and fixed forms. We identified an endemic area of sporotrichosis in the central region of our State. An epidemiological study was performed in the community of “El Durazno” where from a 543 population, 51 had positive intradermal reactions to sporotrichin and 8 had active lesions. In this area the environmental characteristics, as well as the use of natural materials for fences at the houses, probably make suitable conditions for the development of the disease. Including all our cases, we found that this infection is more frequent in children between 6 to 12 years of age, as they are involved with both house and outdoor activities, a finding similar to that reported by Bonifaz *et al.* (8) in Mexico. Clinical aspects of sporotrichosis ranged from small papules with a crust on the surface (mini-sporotrichosis) (Figure 2) or extensive plaques with deforming scars (Figure 3).



Figure 2: Mini-sporotrichosis



Figure 3: Plaque with deforming scar

The lymphangitic form can frequently affect the entire length of the lymphatic chain for the entire extremity. The treatment in all cases was Potassium iodide at 1-3 g daily in children and 3-5 g/day in adults. Only one case had gastric intolerance, and this patient changed to treatment with itraconazole 100mg / day. All the cases had both clinical and mycological cure.

### **Chromomycosis**

We report 6 cases of chromomycosis and of these, 4 were diagnosed clinically in the communities, and afterwards referred to Acapulco General Hospital to continue their investigations and treatment. Due to a late presentation and poor response to traditional treatments only two patients with limited lesions finished their treatment with itraconazole 200mg a day for 6 months combined with cryotherapy (12). The rest only attended the initial consultation.

It is a disease frequently misdiagnosed by general physicians in our environment. As in other countries *Fonsecaea pedrosoi* is the most frequent causal agent (9) Desquamation and small black crusts on the surface over an erythematous plaque of verrucous appearance was the characteristic morphology of these cases. Direct examination of skin scrapings is very useful as the presence of Medlar bodies, also known as fumagoid cells, are pathognomonic.

Histopathological studies are simple to carry out, as there is no need for special stains to find the typical fungal structures. Nevertheless, some cases, particularly those with extensive infections can be a treatment challenge. There are many reports of different treatments with itraconazole, fluconazole, terbinafine, flucytosine amongst others; and more recently with new antifungals as posaconazole, micafungin, and anidulafungin have been used with good results especially in cases refractory to standard therapies (10,11). Combinations of chemotherapy with cryotherapy and surgical excision are also therapeutical options but mainly in small sized lesions.

## Paracoccidioidomycosis

Our statistics include four mucocutaneous cases of paracoccidioidomycosis. All of them were from the coffee growing area of Guerrero state. Clinically lesions were characteristic and the diagnosis was confirmed later with complementary studies such as thoracic X-ray, biopsy, culture and direct examination. One of our cases started treatment with itraconazole and with clinical improvement. But unfortunately the patient discontinued treatment and returned after 6 years with relapse and wide extension of the lesions (Figure 4).



Figure 4: Paracoccidioidomycosis

Paracoccidioidomycosis is a respiratory mycosis, which can be disseminated hematogenously or spread to lymph glands. The mucocutaneous form develops as a muriform stomatitis or granulomatous plaque with erythematous and infiltrated skin lesions such as papules, ulcers or verrucous nodules. It is caused by *Paracoccidioides brasiliensis*. This disease is more frequent at the tropics and these areas in Guerrero share environmental similarities with other regions in Mexico as Veracruz and Chiapas. The histological features are a granulomatous infiltrate with single or multiple budding yeasts whose morphology has a “ship’s wheel” appearance.

## Discussion

Subcutaneous mycosis as described by other authors are in need of international recognition, as most of the resources are invested in other mycoses rather than in research into these diseases (13). Voriconazole (14, 15, 16), posaconazole (17, 18) and even terbinafine have been described as effective for mycetomas and others mycoses (19, 20). However they have limitations as effective therapy requires long term treatment, and the drug acquisition costs are high, in addition there is considerable difficulty in acquiring these new agents in countries where these diseases are common.

As mentioned previously, most of these mycoses follow traumatic inoculation. Therefore, the vegetation plays an important role in the pathogenesis of these diseases. Acacias (*Acacia constricta*) also known as “Huisache” and other species like *Mimosa púdica* (21) in the rural areas, are thorn-bearing plants that grow wild, mostly in the central region of our state. Their wood and branches are often used to make rustic fences and for cooking fuel, which explains the constant exposure of the patients to minor trauma from this material. In rural communities villagers often use organic material like plants, stones or leaves to clean themselves after defecation which increases the risk of perianal mycetomas as reported by Chavez et al. (22).

Even though there are a great variety of climates in Guerrero, we have seen that on the south coast, there is a higher incidence of eumycetomas, compared with actinomycetomas, which share the same environmental plants as routes of inoculation. Paracoccidioidomycosis is well known to be more frequent in environmental areas which, due to rainfall, together with an acid soil, provide appropriate conditions for growing coffee plants and for the development of this disease. Chromomycosis has been identified from very different regions and even though it is predominantly seen in tropical areas.

Mycological studies are of great help for the diagnosis of all the previously described diseases which are, probably under diagnosed, as they are more frequent in rural areas but very few clinical laboratories have trained individuals or mycologists to perform such studies.

## **Conclusions**

Direct assistance to communities by dermatologists and the appropriate training of health personnel in the rural areas, make programs such as Community Dermatology C.A. (C.D.C.A.), a real need especially in third world countries, where there are similar levels of poverty, needs and diseases worldwide (23). Rather than being seen as a philanthropic activity, it becomes a responsible contribution to our specialty. During CDCA, communities are visited in order to identify those patients who otherwise would probably not be diagnosed leading to delay in treatment and subsequent wastage of economic resources, that are diverted from use for basic needs as well as providing training to individuals involved in health care in the management and diagnosis of simple and common diseases. By reviewing our experience with deep mycoses we have highlighted a problem seen in rural care in poor regions where identification and therefore appropriate treatment of disease that can cause severe morbidity or even death is often delayed until a late stage. Inadequate diagnostic facilities and access to the correct treatment compound the problem. We believe that an essential part of community dermatology involves sensitizing health care workers to less common disease states that pose a severe threat to patients as well as dealing with the common. Whether this can be helped by other actions such as the introduction of teledermatology or diagnostic algorithms remains to be seen. However this is a problem that will not go away.

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