

MYCETOMA



Almina, a mycetoma patient, showing her lesions to Prof Fahal and his team at the Mycetoma Research Centre, Sudan.

> **Mycetoma** is a truly neglected disease on every level. Although many suffer from this devastating infection, the global burden of disease is unknown, as those affected live in remote villages in the tropics and subtropics where there is no disease surveillance. The route of transmission is also unknown, and although it is thought that the infection may come from the soil or from animal dung, entering the body after the skin has been pricked, by a thorn for example, there have been no comprehensive studies to prove this theory.

Mycetoma was included in the official list of Neglected Tropical Diseases during discussions at the World Health Assembly in May 2016 – the 18th disease to be included – giving the disease the political prominence it so desperately needs. Such an important step will allow governments as well as other funding bodies to consider providing resources to set up research programmes

Newly recognized as a neglected disease by WHO

for the development of new treatments and diagnostics to combat the disease.

What are the current treatments and their limitations?

There are two groups of microbial agents which cause disease. Actinomycetoma – the form caused by filamentous bacteria (actinomycetes) – responds well to antibiotics (amikacin and co-trimoxazole) and has a 90% cure rate. However eumycetoma – the fungal form – develops into a chronic skin infection which, without treatment, invades the surrounding tissue and bone. Children and young adults, particularly men working outdoors, are most at risk.

Early treatment has a higher chance of being effective, but patients live a long way from health centres and tend to present with advanced disease, if at all, by which time antifungal cure is only 25-35% effective. Treatment is most often followed by surgical removal of the remaining mass and there is a high chance of recurrence, often leading to multiple amputations and ultimately the loss of entire limbs, with the associated risk of complications and death. Current antifungals are expensive and cause serious side effects, and an effective, safe, and affordable curative treatment for use in rural settings is desperately needed.

Ketoconazole and **itraconazole** are the antifungal agents that are currently in use, however these have serious side effects. Concerns about liver toxicity have lead the FDA and EMA to restrict the use of ketoconazole. Both the duration (twelve months) and cost of treatment are significant barriers to access for patients and health authorities in endemic areas, and as a result drop-out rates are high: at 10,000 USD per annum, the treatment represents between 50-100% of the average annual wage of patients.

A stigmatizing disease

that causes devastating deformities, often resulting in amputation and morbidity.

Basic epidemiological information is missing

for this very neglected disease.

The causative organisms of mycetoma are **endemic in tropical and subtropical areas of the 'mycetoma belt'**.

WHAT IS DNDi DOING TO ADDRESS UNMET TREATMENT NEEDS?

Recognizing an opportunity to test the effectiveness of fosravuconazole in treating mycetoma after experience with this drug as a Chagas agent, DNDi included its clinical testing for the disease in its Business Plan 2015-2023 as a short-term, pragmatic, mini-portfolio approach, and in 2016 will begin a clinical study in partnership with the Mycetoma Research Centre in Sudan.