

World Health Organization strategic framework for skin-related neglected tropical diseases

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Key words: World Health Organization; skin; neglected tropical diseases.

In June 2022 the World Health Organization (WHO) launched *Ending the neglect to attain the sustainable development goals: a strategic framework for integrated control and management of skin-related neglected tropical diseases*.¹ This important policy document aims to benefit the one billion or more people either at risk of, or affected by, skin-related neglected tropical diseases (skin-NTDs). It builds on several previous initiatives, in particular, *Ending the neglect to attain the sustainable development goals: a road map for neglected tropical diseases 2021–2023*,² launched by WHO in 2020 and to which this skin strategic framework now serves as a companion document. Earlier work had also included the publication of a training manual for frontline health workers to help them recognize tropical diseases through changes on the skin,³ evolution of this into a diagnostic mobile app⁴ and subsequent integration with SkinApp (from NLR, No Leprosy Remains) to form the current WHO Skin NTDs app.⁵

NTDs are diseases that are widely endemic in low- and middle-income countries and that often affect people in remote rural areas. To date they have been largely ‘neglected’ not only by public health services within their own countries but also globally by research and drug development. The skin-NTDs are those that produce

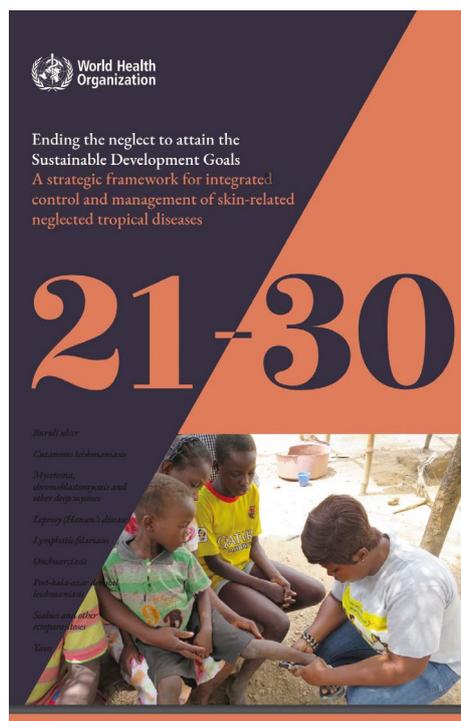


Fig 1. Front cover of *Ending the neglect to attain the Sustainable Development Goals: a strategic framework for integrated control and management of skin-related neglected tropical diseases*. Geneva: World Health Organization, 2022. Licence: CC BY-NC-SA 3.0 IGO.

signs and symptoms on the skin. At least 10 of the 20 NTDs currently prioritized by the WHO present with skin changes before any changes occur internally or physical disabilities develop. Included in the list of skin-

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NTDs are yaws, leprosy, onchocerciasis, lymphatic filariasis, Buruli ulcer, leishmaniasis (cutaneous, visceral and post kala-azar dermal forms), mycetoma, chromoblastomycoses and deep mycoses, and scabies and other ectoparasites.

Historically, various NTD programmes have tended to target just one specific

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Fig 2. The World Health Organization Headquarters, Geneva.

disease, but changes on the skin are often easily visible, presenting a key opportunity to integrate various aspects of care for more than one NTD at a time in a more efficient and cost-effective way. Potential areas for integration include surveillance and data management, staff training, clinical and laboratory diagnosis, wound/lymphoedema care, treatment (both mass drug administration and individual case management) and prevention and management of disabilities and stigma reduction. Another salient feature of the framework is the recognition that other common skin conditions, such as superficial fungal infection, impetigo, eczema and acne, account for more than 80% of the burden of skin diseases in NTD-endemic areas.^{6,7} Targeting these common complaints, as well as skin-NTDs, will help reduce stigma and improve community acceptance of such projects. It is well recognized that stigma and discrimination towards people with skin-NTDs occurs not only by other community

members but even sometimes by healthcare workers. Stigma associated with skin-NTDs can deter patients from seeking early medical help, resulting in disabilities and deformities and further poverty. The skin strategic framework focuses on person-centred care to encourage early intervention to reduce stigma, improve local health provision, develop patient support networks and enable patients to remain in their communities and continue gainful employment.

The WHO 2021–2030 road map sets out various ambitious targets for specific NTDs by 2030. Some examples for the skin-NTDs include eradication of yaws in 100% of endemic countries and elimination (interruption of transmission) of leprosy in 62% of endemic countries.² The challenge now is for endemic countries to tailor and incorporate the framework's recommendations into their national health programmes and build capacity. By encompassing care for common general skin conditions, as well as for skin-NTDs, they will be working towards achieving 'skin health for all'.

References

1. World Health Organization. *Ending the neglect to attain the sustainable development goals: a strategic framework for integrated control and management of skin-related neglected tropical diseases*. WHO, 2022. Available at: <https://www.who.int/publications/i/item/9789240051423> (last accessed 14 November 2022).
2. World Health Organization. *Ending the neglect to attain the sustainable development goals: a road map for neglected tropical diseases 2021-2030*. WHO, 2020. Available at: <https://apps.who.int/iris/handle/10665/338565> (last accessed 14 November 2022).
3. World Health Organization. *Recognizing neglected tropical diseases through changes on the skin: a training guide for front-line health workers*. WHO, 2018. <https://apps.who.int/iris/handle/10665/272723> (last accessed 14 November 2022).
4. World Health Organization. Neglected tropical diseases of the skin: WHO launches mobile application to facilitate diagnosis. Available at: <https://www.who.int/news/item/16-07-2020-neglected-tropical-diseases-of-the-skin-who-launches-mobile-application-to-facilitate-diagnosis> (last accessed 14 November 2022).
5. NLR. NLR's SkinApp embraced by World Health Organization. Available at: <https://nlrinternational.org/news/nlrs-skinapp-embraced-by-world-health-organization/> (last accessed 14 November 2022).
6. Mey S, Fuller LC, Bendick C. The impact of skin disease on patients in Cambodia – a survey and simple needs assessment. *Community Dermatol J* 2015; **11**:21–6.
7. Yotsu RR, Kouadio K, Vagamon B *et al*. Skin disease prevalence study in schoolchildren in rural Côte d'Ivoire: implications for integration of neglected skin diseases (skin NTDs). *PLoS Negl Trop Dis* 2018; **12**:e0006489.

NURSING AT WCD

Every 4 years the World Congress of Dermatology (WCD) acts as a focal point for the international dermatology community to meet to discuss, debate and learn. WCD2023 will be held in Singapore and will bring together healthcare professionals and scientists from across the globe to develop the specialty, enabling the best possible care and treatment for people with skin disease.

Nursing has had a presence at the World Congress since 2007 in Buenos Aires, Argentina when we live streamed the event, this was a first and set the nursing community up as a permanent fixture at the WCD. In Singapore the nursing meeting will be held on Monday 3 July 2023, organized by the British Dermatological Nursing Group (BDNG). The title for the nursing meeting is 'Innovations in care for hard-to-reach populations', defined as groups of people (or individuals) who find it difficult to access care. Reasons for this difficulty will be hugely varied, including geographical, economic, physical, psychological or social factors. Nurses are well placed to assist patients to access care and we feel sure that this meeting will highlight many instances of good practice.

If you would like to submit an abstract please contact Susan Maguire at susan.maguire@bdng.org.uk

Rebecca Penzer-Hick, President BDNG.

Tungiasis

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Key words: Tungiasis, *Tunga penetrans*, Jiggers.

Key learning points:

1. Tungiasis is caused by female sand fleas, the eggs, larvae and pupae of which develop off-host in dry soil, mostly inside people's houses.
2. The female flea burrows into the skin, mostly of people's feet, and grows rapidly, causing considerable pain and itching and, subsequently, difficulty with walking, sleeping and concentrating.
3. There is currently no effective and safe treatment available in endemic areas but products being studied include dimeticone oils (NYDA[®]), neem and coconut oil and benzyl benzoate.
4. Prevention should be attempted through sealing of house floors, daily foot washing with soap, use of insect repellents such as coconut oil, and keeping animals out of the house and away from human resting places.

by repair mechanisms, if not removed by the host earlier.¹ The eggs are expelled out of the skin through an opening maintained by the flea through which it also breathes and defecates. (A female who is not mated will still lay eggs, but larvae never hatch.³ Such a situation may occur if a visitor to an endemic area becomes infected). In contrast, when fertilized eggs drop onto the soil and, if conditions are not too dry,³ larvae (also known as off-host stages) will hatch after 3–4 days.³

In the environment, larvae need very little organic matter to survive and develop. After 7–10 days the larvae pupate and 7 days later adults emerge and seek a host. Most of the off-host stages develop in the sleeping places of infected individuals, the eggs drop to the floor where and when they sleep, the larvae develop and when the adult emerges they find a host very quickly.

Morbidity

The rapidly growing female induces a strong inflammatory response with oedema, erythema and desquamation in most cases (Fig. 2). (The level of acute morbidity directly correlates with the number of embedded fleas.⁴) This causes intense pain and itching that make it difficult for the patient to sleep, walk and to concentrate on any activity, including school work.



Fig 2. Inflammation and deformed nails and toes caused by embedded *Tunga penetrans* (credit H. Feldmeier).

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N.B. Additional teaching information on Tungiasis is available via the [openwho.org](https://openwho.org/courses/NTDs-tungiasis) website:
<https://openwho.org/courses/NTDs-tungiasis>

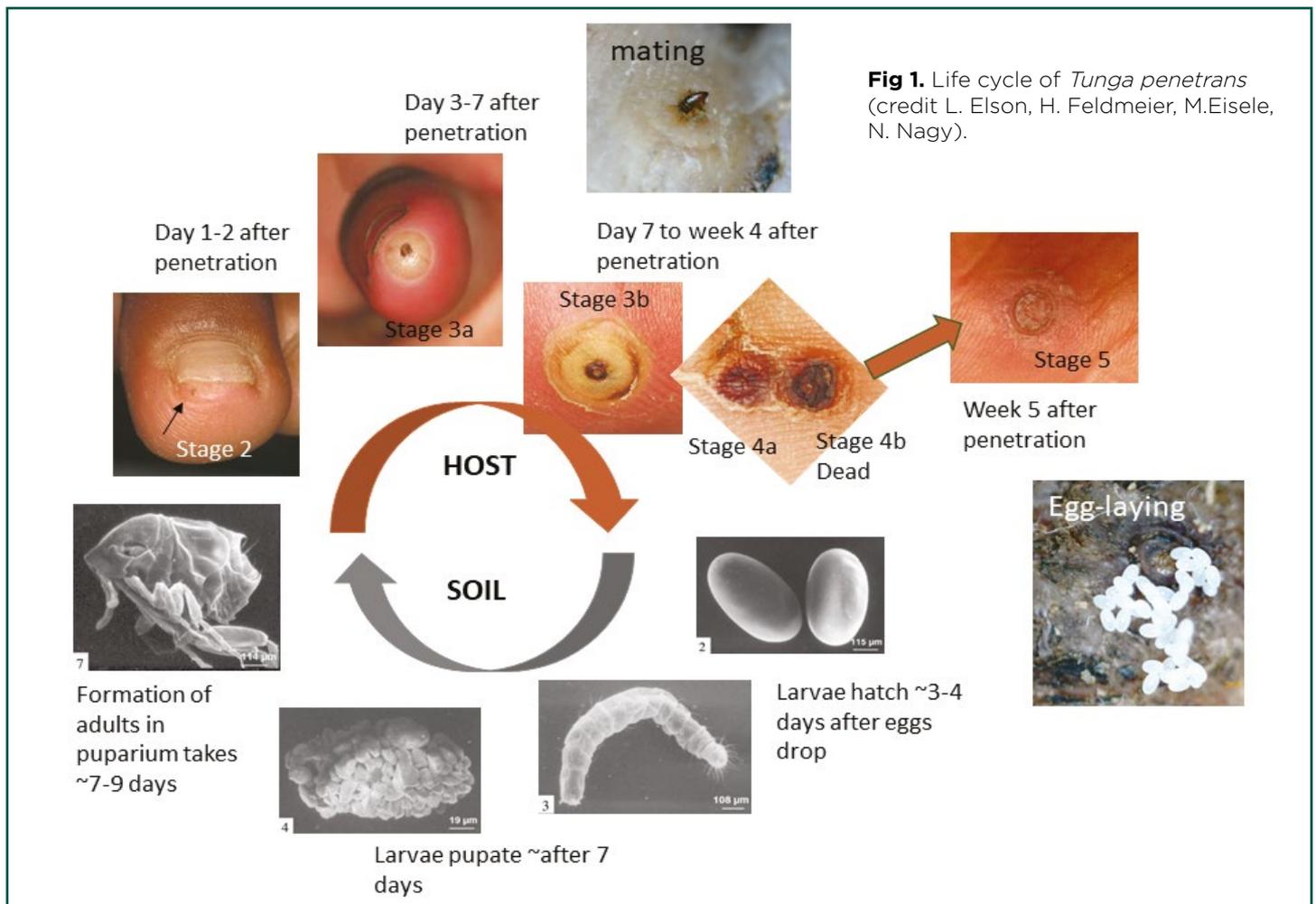
Introduction

Tungiasis is an ectoparasitic skin disease caused by *Tunga penetrans*, a sand flea of the Order Siphonaptera; it is the smallest known flea at 1 mm in length.¹ The adult female flea burrows into the skin of the host, most usually the skin of the feet but it can be any body part. It mostly affects extremely resource-poor, marginalized communities in Central and South America, the Caribbean and Sub-Saharan Africa.²

Life cycle

After the adult female flea burrows into the skin it feeds on the blood of its host and grows rapidly increasing in size 2000-fold over 7 days as eggs develop in the abdomen¹ (Fig. 1, overleaf). At this stage the free-living male will copulate with the embedded females, take a blood meal from the same host and continue to seek out and copulate with other females.

The female lays more than 100 eggs over the next 3 weeks and then dies, and by week 5 the carcass is expelled from the skin



Those infected with many fleas over a long time develop chronic pathology characterized by hyperkeratosis, fissures, deformed or lost nails and deformed toes⁴ (Fig. 2). Discomfort causes a typical unusual gait as patients attempt to walk without putting pressure on the fleas; this can lead to disability (Fig. 3). These deformities lead to stigmatization of patients, discrimination and feelings of shame, reducing children's quality of life.⁵

Very often patients have secondary bacterial infections from bacteria introduced during penetration of the skin, through the skin opening and by the constant scratching with dirty hands. A large number of aerobic and anaerobic bacterial species have been identified from sand flea lesions including *Staphylococcus aureus* and Enterobacteriaceae.⁶ The bacterial infection leads to abscesses and suppuration (Fig. 4), exacerbating the inflammation and pain, and in some extreme cases, tissue necrosis, lymphangitis and gangrene.⁶ The greatest risk, although likely rare, is from secondary infection with *Clostridium tetani* that in individuals who are unvaccinated can be fatal. The itching is thought to be exacerbated by other pathogens that live within the flea's body, known as endosymbionts, such as *Wolbachia*, whose lipopolysaccharides are highly immunogenic if released when the flea and bacteria die.⁷

Many people will attempt to remove the fleas using non-sterile sharp implements such as plant thorns, safety pins or knives (Fig. 5), running the risk of introducing secondary



Fig 3. Walking on the heels to avoid the pain typical of tungiasis.



Fig 4. Abscess surrounding embedded *Tunga penetrans* caused by secondary bacterial infection.

infection, not only of bacteria, but also HIV and hepatitis B and C, as implements are often used on multiple individuals. This process can also cause extensive tissue damage and bleeding. It is common to find people using harmful products on the embedded fleas to try to kill them, such as kerosene/paraffin, used motor oil, veterinary chemicals and extracts from local toxic plants that themselves can cause tissue necrosis and gangrene.⁸

Epidemiology

Although there are no data on actual disease burden in any one country or globally, it is well known that tungiasis is a highly aggregated disease appearing in some villages and not others, in some schools and not in others, even though they are only a few kilometres apart. Even within a village or a school most people will not be infected. Among those who are infected, most will have only a few fleas and little morbidity, while a few individuals will have very many fleas and have severe morbidity and disability. The underlying causes driving this heterogeneity are unknown and are a focus of current research. In most endemic areas it is children under the age of 15 years who have the highest prevalence and intensity followed by elderly and disabled people, all groups who rely on others for their care and personal hygiene (keeping clean).² A few studies indicate transmission may be seasonal, peaking during the dry seasons,² however, this might not be true everywhere depending on climate conditions.

Multiple surveys in South America and Sub-Saharan Africa have identified the main risk factor for infection is living in a house with an unsealed earth floor^{9,10} and this is where most off-host stages have been found.⁸ Other factors that seem to be associated with infection include not wearing closed shoes, not having access to a clean water supply, not washing feet daily with soap, and having house walls of mud and a thatch roof⁹ (Fig. 6). All these factors are associated with extreme poverty.

In addition, in some studies infection has been associated with the presence of free-roaming domestic animals such as dogs, cats, goats and pigs. Pigs seem to be particularly vulnerable to high levels of infection.¹¹ Tungiasis is a zoonotic disease, infecting domestic animals (Fig. 7) and in South America wild animals such as rats, monkeys and wild pigs, all of whom continually contaminate the environment with eggs. However, the flea life cycle is not dependent on any animal and can continue without the involvement of any animal reservoir host.²

Diagnosis

Diagnosis of tungiasis is based on observation of the skin with the naked eye. No other equipment is necessary. The fleas have a characteristic circular shape and in the early stages of development are cream coloured with a black dot in the centre (Fig. 1). As they die, they darken in colour and become irregular in shape. A dead flea carcass is black and irregular



Fig 5. Extracting *Tunga penetrans* with non-sterile instruments.

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Fig 6. Tungiasis mostly affects those living in extreme poverty with unsealed earthen floors.

in shape. Additional signs would be accompanying pain and itching at the site and difficulty sleeping because of the extreme itching.

Treatment

There is currently no effective and safe treatment available in most endemic areas. Surgical extraction is the only guaranteed method but must be conducted under sterile conditions at a health facility. The feet must first be washed with soap and cooled, boiled water. If sterile instruments are not available, other needles can be sterilized by passing through a flame or boiled in water and cooled. The resulting lesion must be flushed with sterile saline (half a teaspoon of salt in 1 cup (250 ml) of cooled, boiled water) and preferably covered with antibiotic ointment. The extracted fleas should be disposed of as hazardous waste, burned or incinerated. The patient must continue to keep the lesion clean. The extraction needs to be done with extreme care so as not to

break the body of the flea, as releasing eggs and symbiotic bacteria into the skin will cause persistent inflammation and itching for months. However, this may not be practical for those with very many fleas (some can have hundreds) or people living in endemic areas where it is hard to keep the lesions sterile.

A few clinical trials have been conducted over the past decade to test potential treatment products. The most promising option for treatment is NYDA[®], a silicon oil (dimeticone) of very low viscosity marketed for the treatment of headlice in developed countries, and now registered and approved by the Pan American Health Organization for the treatment of tungiasis in Central and South America. This product killed 98% of embedded fleas when applied once and works by suffocating the fleas so they cannot develop resistance to it.¹²

Another product that has been tested in a clinical trial is a mixture of neem (*Azadirachta indica*) and coconut (*Cocos nucifera*) oils.¹³ This is a herbal medicine made and used in affected communities in Kenya and was found to kill or disrupt development of 77% of fleas within 7 days when applied once a day for 2 days. It has the added benefit of assisting skin healing processes and being an insect repellent so reducing re-infection rates. Neem has been used for thousands of years in India to control insect pests on crops and its active ingredient and mode of action have been shown to be azadirachtin, working as an antifeedant and a growth regulator.¹³

At times, medical practitioners use generic products containing benzyl benzoate or permethrin off-label for tungiasis treatment. These are medicines on the

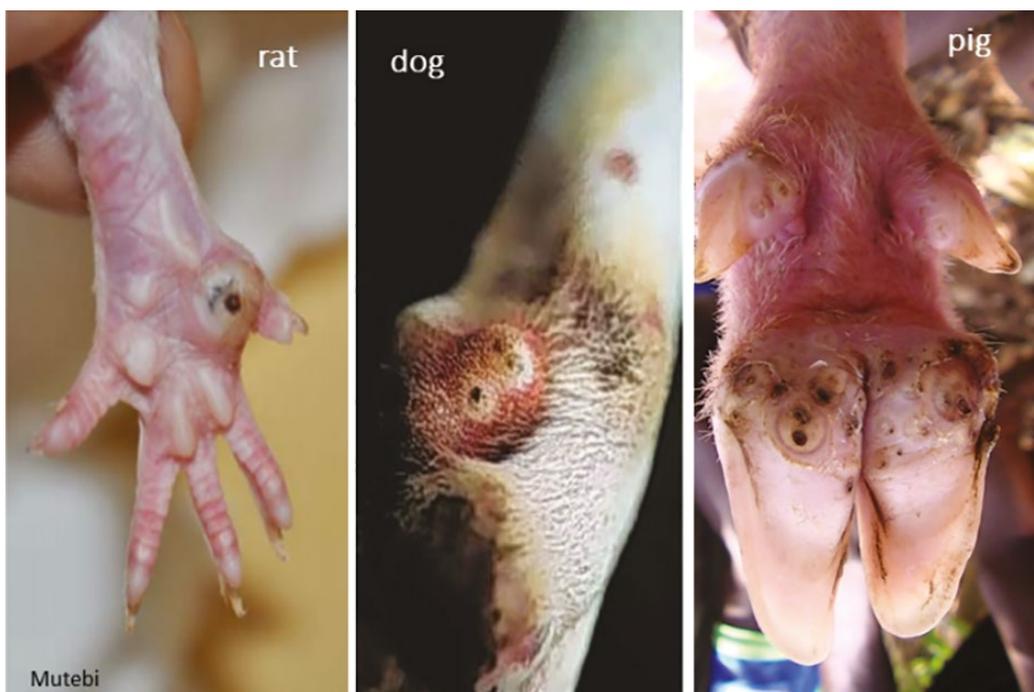


Fig 7. The feet of domestic animals infected with *Tunga penetrans* (credit F. Mutebi).

World Health Organization essential medicines list for treatment of scabies, another parasitic skin disease. However, their efficacy and adverse effects when used for tungiasis control have not undergone any clinical trials and hence should be used with caution and under close observation.

Any individuals from whom large numbers of fleas have been extracted and those with abscesses from secondary bacterial infection should be treated with systemic antibiotics such as trimethoprim, sulfamethoxazole, tetracycline or amoxicillin (with/without clavulanate). In addition, their vaccine history should be checked for tetanus vaccination and given if missing or if given more than 10 years before.



Fig 8. Low-cost house floor to prevent tungiasis.

Prevention

Treatment of tungiasis cases must be combined with prevention efforts, otherwise patients will immediately become re-infected. The ideal would be to seal the floors of houses, particularly rooms where people sleep to prevent suitable conditions for the development of the off-host stages. However, it is costly to install a standard concrete floor. Trials are underway in Kenya and Rwanda to develop and pilot an affordable flooring alternative that will prevent the development of off-host stages and is something communities can explore for themselves (Fig. 8).

Floors should be hard and smooth for easy cleaning and kept free of any loose material such as dust, soil and sand in which the larvae can survive. Alternatively, indoor insecticides could be sprayed on the house floor to kill the off-host stages, but care must be taken not to use toxic chemicals as small children will be on these floors with open lesions in their feet. Neem-based products are widely used as organic insecticides and are under trial for control of tungiasis.

Risk-factor studies suggest that tungiasis infection could be reduced by wearing closed shoes at all times, however transmission is mostly within sleeping rooms, where shoes are unlikely to be worn. Washing the feet at least once a day with soap may reduce infection as the soap removes any flea faecal matter from the skin, which may attract more fleas and the soap residue on the skin may repel fleas looking for a site to penetrate.⁹ The use of insect repellents on the skin is another possible method to prevent infection, if affordable. Coconut oil-based products have been shown to prevent infection and induce wound healing and they may be more easily available to some communities.¹⁴ Where domestic animals, especially pigs, are infected they should be treated with an insecticide and should always be kept away from areas where people rest and sleep.

Acknowledgments

We thank M. Eisele *et al.*¹ and N. Nagy *et al.*³ and F. Mutebi *et al.* for giving permission to use their photographs.

References

1. Eisele M, Heukelbach J, Van Marck E *et al.* Investigations on the biology, epidemiology, pathology and control of *Tunga penetrans* in Brazil: I. Natural history of tungiasis in man. *Parasitol Res* 2003; **90**:87–99.
2. Feldmeier H, Heukelbach J, Ugbomoiko US *et al.* Tungiasis—a neglected disease with many challenges for global public health. *PLoS Negl Trop Dis* 2014; **8**:e3133.
3. Nagy N, Abari E, D'Haese J *et al.* Investigations on the life cycle and morphology of *Tunga penetrans* in Brazil. *Parasitol Res* 2007; **101** (Suppl. 2):S233–42.
4. Kehr JD, Heukelbach J, Mehlhorn H, Feldmeier H. Morbidity assessment in sand flea disease (tungiasis). *Parasitol Res* 2007; **100**:413–21.
5. Wiese S, Elson L, Feldmeier H. Tungiasis-related life quality impairment in children living in rural Kenya. *PLoS Negl Trop Dis* 2018; **12**:e0005939.
6. Feldmeier H, Heukelbach J, Eisele M *et al.* Bacterial superinfection in human tungiasis. *Trop Med Int Health* 2002; **7**:559–64.
7. Heukelbach J, Bonow I, Witt L *et al.* High infection rate of *Wolbachia* endobacteria in the sand flea *Tunga penetrans* from Brazil. *Acta Trop* 2004; **92**:225–30.
8. Elson L, Wright K, Swift J, Feldmeier H. Control of tungiasis in absence of a roadmap: grassroots and global approaches. *Trop Med Infect Dis* 2017; **2**:33.
9. Elson L, Wiese S, Feldmeier H, Fillinger U. Prevalence, intensity and risk factors of tungiasis in Kilifi County, Kenya II: results from a school-based observational study. *PLoS Negl Trop Dis* 2019; **13**:e0007326.
10. Muehlen M, Feldmeier H, Wilcke T *et al.* Identifying risk factors for tungiasis and heavy infestation in a resource-poor community in northeast Brazil. *Trans R Soc Trop Med Hyg* 2006; **100**:371–80.
11. Mutebi F, Krücken J, Feldmeier H *et al.* Animal reservoirs of zoonotic tungiasis in endemic rural villages of Uganda. *PLoS Negl Trop Dis* 2015; **9**:e0004126.
12. Nordin P, Thielecke M, Ngomi N *et al.* Treatment of tungiasis with a two-component dimeticone: a comparison between moistening the whole foot and directly targeting the embedded sand fleas. *Trop Med Health* 2017; **45**:6.
13. Elson L, Randu K, Feldmeier H, Fillinger U. Efficacy of a mixture of neem seed oil (*Azadirachta indica*) and coconut oil (*Cocos nucifera*) for topical treatment of tungiasis. A randomized controlled, proof-of-principle study. *PLoS Negl Trop Dis* 2019; **13**:e0007822.
14. Thielecke M, Raharimanga V, Rogier C *et al.* Prevention of tungiasis and tungiasis-associated morbidity using the plant-based repellent Zanzarin: a randomized, controlled field study in rural Madagascar. *PLoS Negl Trop Dis* 2013; **7**:e2426.

Acro-ischaemia in a patient with COVID-19 and meningococcaemia: a diagnostic conundrum in a resource-poor setting

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Key words: Acro-ischaemia; COVID-19; meningococcaemia.

Key learning points:

- In the presence of COVID-19 acro-ischaemia a high index of suspicion for comorbidity with meningococcaemia can be life-saving.
- This case report highlights the need for close collaboration between specialists in the care of patients.

Introduction

The COVID-19 pandemic has brought diagnostic challenges to resource-poor settings. Africa has recorded a 43% rise in mortality and a case fatality rate of 2.6%.¹ Skin involvement can aid the diagnosis of COVID-19.²

Reported cutaneous manifestations are varied and can include peripheral cyanosis and gangrene secondary to

hypercoagulability and formation of microthrombi.^{3,4}

This case report emphasizes the role of skin manifestations and diagnostic uncertainties in the diagnosis of meningococcaemia and COVID-19.

Case presentation

An 11-year-old male secondary school student was admitted with fever, headache, generalized body pain and passage of dark brown urine. There was a history of non-bilious and non-projectile vomiting, anorexia and generalized body weakness. Five days into the admission, he developed raised red, non-itchy lesions on the face that progressed to involve the trunk and limbs. These lesions developed into dark-coloured fluid-filled blisters that ruptured leaving black adherent patches and plaques. There was involvement of the genitals but no oral mucosal involvement.



Fig 1. Necrotic patches and bullae on the legs (a,b) and gluteal region (c).



Fig 2. (a) Necrotic patches on the legs and dorsum of the right foot and **(b)** gangrene of the third digit.

On examination he was drowsy and restless, febrile (38.2 °C), with a tachycardia (152 beats per min), a blood pressure of 79/56 mmHg and tachypnoea (64 breaths per min). Skin examination showed multiple symmetric hyperpigmented necrotic patches and plaques on the trunk and limbs. There was extensive involvement of the gluteal region and the lower limbs with some intact and flaccid bullae on a background of erythema in the dependent parts of the legs (Figs 1 and 2).

The Nikolsky sign was negative, but Asboe Hansen's sign (i.e. lateral extension of the blister after applying pressure to the top) was positive. There was hyperpigmentation of the right third toe with gangrene (Fig. 2). Dorsalis pedis pulses were felt bilaterally. Examination of other systems was normal.

Investigations showed the following.

- *Urine analysis:* protein 3+; blood +; nitrite trace; leucocytes +; pH 5.0; specific gravity 1.025.
- *Blood results:* packed cell volume 24%; leucocytosis (16,300 cells/mm³) with a left shift of neutrophils and toxic granulation; platelets 72,000/cubic mm; prothrombin time, partial thromboplastin time with Kaolin and international normalized ratio 15 sec, 57 sec and 1.08, respectively; acidosis; hyponatremia (122 mmol/l); random blood glucose 5.0 mmol/l.
- *Cerebrospinal fluid:* glucose 3.2 mmol/l (with corresponding blood glucose 6 mmol/l); protein (139 mg/dl); no bacterial growth.



Fig 3a-c. Healed necrotic patches after treatment.

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Acro-ischæmia in a patient with COVID-19 and meningococcaemia: a diagnostic conundrum in a resource-poor setting...continued

- SARS-COV2 reverse-transcriptase polymerase chain reaction: positive.
- Blood culture: yielded diplococci, sensitive to ceftazidime.

The patient was placed on intravenous ceftazidime, 2G immediately then 1G 12-hourly, intravenous saline infusion, transfusion of fresh whole blood, debridement of necrotic skin with wound dressing, oral Vitamin C 500 mg thrice daily, zinc sulphate 100 mg daily, intramuscular tetanus toxoid 0.5 ml stat and subcutaneous anti-tetanus serum 1500 IU stat. The patient significantly improved with isolation and treatment. Active skin lesions resolved at about 14 days with significant scarring (Fig. 3). He was discharged home and was followed up on an outpatient basis. The patient was collaboratively managed by the paediatrician, medical microbiologist, dermatologists and plastic surgeon.

Discussion

Microembolism formation and coagulopathy is a recognized feature of COVID-19 infection.⁵ COVID-19 can occur in association with meningococcaemia caused by a Gram-negative diplococcus, *Neisseria meningitidis*, the main aetiological agent of bacterial meningitis in children and adults who have close contacts with children.⁶ Coinfection of COVID-19 and *Neisseria meningitidis* carries a high risk of mortality.⁷ Viral infection of the nasopharynx can impair its barrier function and enhance bacterial colonization.⁸ Acro-ischæmic COVID-19 skin manifestations can include chilblain-like acral perniosis and erythema multiforme-

like lesions,⁹ which posed a diagnostic challenge in this patient. Microbiological confirmation of coinfection with meningococcus aided correct full diagnosis and commencement of life-saving treatment.

Conclusion

Meningococcaemia carries a grave prognosis in a resource-poor setting, especially when associated with COVID-19 infection. Similar cutaneous clinical features should help raise more awareness of these diseases in resource-poor settings.

References

1. World Health Organization Africa. COVID-19 surges in Africa surge more 40% over previous week. Available at: <https://www.afro.who.int/news/covid-19-deaths-africa-surge-more-40-over-previous-week> (last accessed 14 November 2022).
2. Visconti A, Bataille V, Rossi N *et al*. Diagnostic value of cutaneous manifestation of SARS-COV-2 infection. *Br J Dermatol* 2021; **184**: 793–4.
3. Novara E, Molinaro E, Benedetti I *et al*. Severe acute dried gangrene in COVID-19 infection: a case report. *Eur Rev Med Pharmacol Sci* 2020; **24**: 5769–71.
4. Hubiche T, Cardot-Leccia N, Le Duff F *et al*. Clinical, laboratory and interferon-alpha response characteristics of chilblain-like lesions during the COVID-19 pandemic. *JAMA Dermatol* 2021; **157**: 202–6.
5. Hong LZ, Shou ZX, Zheng DM, Jin X. The most important biomarker associated with coagulation and inflammation among COVID-19 patients. *Mol Cell Biochem* 2021; **476**: 2877–85.
6. Brower MC, Tunkel AR, van de Beek D. Epidemiology, diagnosis and antimicrobial treatment of acute bacterial meningitis. *Clin Microbiol Rev* 2010; **23**: 467–92.
7. Wei M, Yang N, Wang F *et al*. Epidemiology of Coronavirus disease 2019 (Covid-19) caused by SARS-Cov-2. *Disaster Med Public Health Prep* 2020; **14**: 1–9.
8. Bakaletz LO. Viral-bacterial co-infections in the respiratory tract. *Curr Opin Microbiol* 2017; **35**: 30–5.
9. Fernandez-Nieto D, Jimenez-Cauhe J, Suarez-Valle A *et al*. Characterization of acute acral skin lesions in nonhospitalized patients: a case series of 132 patients during the COVID-19 outbreak. *J Am Acad Dermatol* 2020; **83**: e61–3.

CASE FOR DIAGNOSIS

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A 35-year-old woman presented with a swollen, slightly itchy upper lip for 3 months, more prominent on certain days, less on others. Overall, the condition was worsening progressively.

The lip felt rubbery to touch. The mucosal aspects of the lips and the tongue were not involved.

She was completely healthy otherwise and did not use any medication or topical lip applications. She had no known allergies.

Answer on page 31



What is the diagnosis?

- a) Angioedema of lip b) Foreign body reaction
c) Mucocutaneous leishmaniasis d) Granulomatous cheilitis e) Leprosy

Personal view: health and dignity for people with albinism

Mafalda Soto Valdés

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Lodina was the second of eight siblings; her name in chichewa, the main Malawian language, means 'the earth has betrayed us'. Lodina had albinism.

Her HIV-positive cousin sexually abused her in the belief that having sex with a woman with albinism would cure him of AIDS. After the rape, the village chief called a council to decide how to deal with the matter. His mother said they should not be harsh with her son as he was family, and family is paramount. Her father thought differently, it was time someone respected his honour and took pity on his offspring. Traditional leaders, hospital representatives, community chiefs gave their opinions and discussed at length about how to solve the situation. Everyone was talking, everyone had an opinion, everyone except Lodina, the victim. It mattered little what she thought, what she felt. Lodina stood on the side lines, her eyes fixed on the floor, without tears, without expression... Lodina had grown up without an opinion, without the freedom to decide. When from the hospital we filled in her personal file to the question 'what is your occupation?', she continued to stare at the floor; it was her older brother who answered 'She is just there' (Fig. 1).

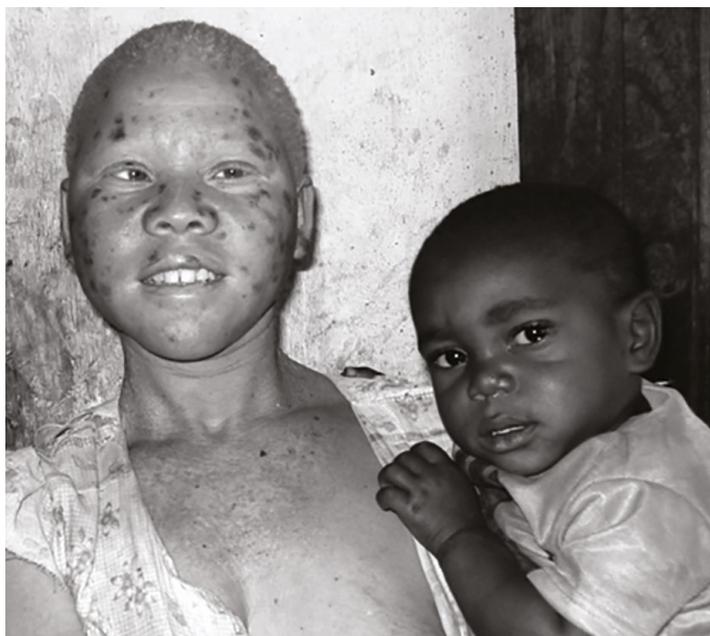


Fig 1. Lodina and her son.

The only thing that differentiates the rest of us from people with albinism is that they have impaired melanin production. This causes them to have more delicate skin and low vision, so they have to apply sunscreen frequently and wear special glasses, just as I have strong myopia and have to wear glasses.

It is transmitted from parents to children with the peculiarity that two non-albino parents who carry the gene have a 25% chance of having a child with albinism.

Until Darwin revolutionized knowledge with his *On the Origin of Species* a large part of humanity was convinced that men

came from mud and women from a rib of man. Galileo was silenced by the Inquisition for announcing that the earth was round. People here and there, in the past and in the present, have asked questions, seeking answers to universal and less transcendental questions. Science has been answering many of these questions, but there is much work to be done, and many places where science has not yet penetrated. In these places, magic and superstition rule, and they do so with a vengeance.

With an estimated population of around 200,000 individuals with albinism, sub-Saharan Africa is the region with the highest prevalence in the world (Fig. 2). And it is also the region with the highest level of ignorance around the condition.



Fig 2. A child with albinism in a group.

Two black people give birth to a white baby!!! What happened? Men have their doubts, which is why it is so common for women to be abandoned by their partners when they give birth to a baby with albinism. In Tanzania people with albinism are known as 'zeruzeru', ghosts. It is believed that when they die they disappear, that possessing members of their body brings luck. Violence and persecution are more justifiable as they are not 'human beings', but zeruzeru.

Ignorance and the negative stigma are their two great enemies. The sun is another.

In many African countries, the sun kills 90% of people with albinism between the ages of 30 and 40 years.

Malawi, January 2009. Jeremiah was the first baby with albinism I held in my arms. His mother arrived at the hospital with the little boy on her back. Jeremiah was 3 weeks old and his face was scorched with second degree burns (Fig. 3). When we explained to her the reason for the burns, she burst into tears with a sense of guilt. Within weeks of implementing good sun-protection practices, Jeremiah's mother was smiling again.

Continued overleaf...



Fig 3. Jeremiah, (a) before and (b) after our sun protection support.

In much of Africa, albinism and its health consequences are unknown to institutions. Despite having the highest prevalence in the world, African countries do not include albinism in university curricula, nor do they allocate budgets to invest in the protection they need. Health workers are unaware of the condition. Sunscreens are science fiction and when they do receive them, they are often out of date, of dubious quality or come from donations that fuel customs corruption.

After Malawi, I moved to work at the Regional Dermatology Training Center (RDTC), the leading dermatology training centre in English-speaking sub-Saharan Africa. There, every day we encountered hundreds of desperate stories of young people with albinism arriving with advanced stages of skin cancer where 'there was nothing to be done'. Tumaini was one of them (Fig. 4). The year was 2012 and Tanzania, with over 45 million inhabitants, had only four dermatologists. So Tumaini didn't think twice, she threw her rucksack on her back and set off on a 2-day journey to the hospital; when she arrived, the surgeons told her they could do nothing for her.

Her tumour had spread too far 'there was nothing to be done' and she was referred to one of two cancer centres in the country, but Tumaini had no money for more trips. She would die at home after 2 months.



Fig 4. Tumaini, when she arrived at the Regional Dermatology Training Center (Moshi, Tanzania).

Jeremiah, Lodina and Tumaini were the trigger: 'What do you mean, we can't do anything?!' And so a reaction of non-conformism, of rejection of those injustices, sowed the beginning of our struggle for the right to health and dignity of people with albinism.

Hand in hand with the management of a proactive and supportive department, I started to work on the development of a sunscreen specially designed for the prevention of skin cancer in people with albinism in Africa (Fig. 5). Within 2 years more than 2000 people across the country were receiving it on a regular basis. But the problem was not unique to Tanzania, it had to cross borders, and go beyond. Stories like Tumaini's could not be repeated, and to do so we had to work on prevention. But it was also necessary to prevent situations like Lodina's from arising, which is why education played an essential role.

Together with experts from various sectors, we set to work on developing a comprehensive model of services that would respond to their needs without perpetuating dependency.



Fig 5. People with albinism attending a clinic..

And that is how, in 2017, the non-governmental organization (NGO) Beyond SunCare, was born.

Beyond SunCare's model, declared Best Practice by the United Nations in 2017, includes a customized sunscreen – high quality and simple to manufacture, as our ultimate goal is local production. The distribution of this cream reaches the most remote places accompanied by education and awareness raising. We train and educate health workers and associations of people with albinism. We work for them and with them. We do advocacy because, although our approach is not top-down, it is important to stir the consciences of those who pull the strings.

We have already helped change the future for more than 4000 people with albinism, more than half of them children. The services have reduced precancerous lesions by 50% and more than 95% of them state how their self-confidence and integration into the community has improved after being part of the programme.

In Tanzania I met Grace. Orphaned at the age of 5 and orphaned of a brother at 18 (cancer), Grace sought refuge with a man who was anything but a good person. With a 6-month-old baby, she found the strength to leave him and make a life for herself.

2013, at the Kilimanjaro Sunscreen Production Unit we were looking for staff. Grace showed up for the job interview in a tight animal print dress, a long headdress, heavy makeup and an endless smile. Everything about her was colour that brightened up the waiting room of a rather grey hospital. We hired her.

Happy to work in an environment protected from the sun, 7 years after that interview Grace is sending her son to a secondary school; she is about to build her own house and is proud to be working on the creation of a product that

improves the lives of others with albinism. In the lab Grace is just another person, with her strengths and her weaknesses, people don't see a zeruzeru, they don't see a person with albinism, they see a person. I arrived in Malawi in 2008 with the plan to stay for 9 months. I met Lodina, Jeremiah and Tumaini... and those 9 months turned into 9 years (Figure 6). The British poet John Donne wrote: 'Any man's death diminishes me, because I am involved in mankind; and therefore never send to know for whom the bell tolls; it tolls for thee'. That is why when you manage to save a person, to give hope back to a mother, you yourself are reviving.

That is why I stayed, but if I continue today, it is because, with the right support, we can.



Fig. 6. The author and colleagues ensure that in any corner of Africa, when a child with albinism wakes up in the morning, their only concern is to apply the sunscreen, in the same way that I look for my prescription glasses.

International leaders come together at the 3rd ILDS World Skin Summit to improve global skin health



The 3rd ILDS World Skin Summit (WSS) was held in Lima, Peru from 13–15 October 2022 and brought together 119 leaders, representing 47 national and international dermatology associations, including representatives from patient organizations, industry partners and the World Health Organization (WHO).

An interactive programme of plenary sessions and workshops enabled participants to share knowledge, to identify and tackle challenges in their regions and develop common strategies to improve global skin health. After many thought-provoking and fruitful discussions, the participants called for the ILDS – in partnership with its member societies, patient organizations and corporate partners – to globally promote education, access to care,

a high-quality image gallery and registries with high-quality globally representative data relevant to dermatology.

The ILDS would like to thank the El Círculo Dermatológico



del Perú (CIDERM), Colegio Ibero-Latinoamericano de Dermatología (CILAD) and patient organizations for jointly organizing the WSS as well as Dr Jose Ruiz Postigo for presenting and attending the event on behalf of the WHO.



Emma van Rooijen
Head of Operations, ILDS



Apply for DermLink 2023

The 2023 DermLink grant scheme is now open for applications. Through this scheme, ILDS members and member-supported applications can apply for funding of up to US\$5,000 to undertake one-off projects and initiatives to improve the treatment of patients with skin disease in underserved parts of the world. Some previous projects are illustrated here.

There are three types of DermLink grants:

1. Materials and Equipment – up to US\$3,000 for dermatological materials and equipment
2. Individual Training – up to US\$3,000 for short-term dermatological training for an individual
3. Field or Community Projects – up to US\$5,000 for projects in resource-poor regions lasting no more than 12 months

The deadline for applications to our current grant application round is 28 February 2023.

To apply or learn more, please visit:

<https://bit.ly/dermlink>



DermLink 2021: The **Nigerian Association of Dermatologists** undertook free outreach clinics in low-resource and underserved communities across three states in Nigeria.



DermLink 2019: The **Society of Dermatologists, Venereologists and Leprologists of Nepal** provided training for community pharmacists to help combat topical steroid misuse in Nepal.



DermLink 2020: Two young patients at a free skin cancer prevention clinic for people with albinism. The clinic was undertaken by **Beyond SunCare**, in partnership with the **Brazilian Society of Dermatology**, in Bié, Angola.



DermLink 2019: Free outreach clinic and COVID-19 awareness workshops for underserved Maasai communities conducted by the **Tanzania Society for Dermatovenereology**.

DIAGNOSIS ANSWER

d) Granulomatous cheilitis

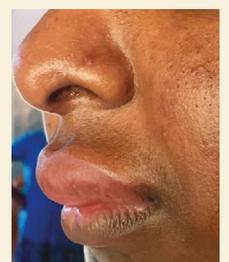
Discussion

Granulomatous cheilitis is characterized by chronic persistent swelling of one or both lips. The condition can be a feature of a generalized granulomatous condition such as sarcoidosis or Crohn disease, but when occurring in isolation, as in this case, it is known as cheilitis granulomatosa of Miescher. Rarely, lip swelling is associated with fissuring of the tongue and facial palsy; this triad is known as Melkersson-Rosenthal syndrome. The initial lip swelling may be transient and recurrent. As the disease progresses the swelling becomes chronic and persistent with fissuring, scaling and a rubbery texture.

The exact cause of granulomatous cheilitis remains unknown. The condition may be associated with allergic contact dermatitis or lymphoedema secondary to infection.

Clinical diagnosis is largely by exclusion. Histopathology shows non-specific granulomata.

Granulomatous cheilitis is often treated with corticosteroids (topical, intralesional or systemic). Long-term anti-inflammatory antibiotics like tetracyclines, immunosuppressives and surgical reduction are some other treatment options. However, the condition is typically chronic and often recurs.



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Officially founded in 1935, the International League of Dermatological Societies (ILDS) has been promoting skin health around the world for over 80 years. Its forerunner began in 1889 at the first of many World Congresses of Dermatology. Today, the ILDS represents dermatology at the highest level with over 170 members from more than 80 countries; we represent over 200,000 dermatologists.

The International Foundation for Dermatology (IFD) was created in 1987 to carry out the global health dermatology activities of the ILDS. Today, the IFD supports projects in Africa, AsiaPacific and South America. CSH is the official journal of the IFD.



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