Cutaneous Larva Migrans Outbreak in Seeb Wilaya: A Case Series

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Abstract

Objectives: Cutaneous Larva Migrans (CLM) is a parasitic skin infection caused by the larvae of hookworms, particularly Ancylostoma Braziliense and Ancylostoma Caninum. CLM is prevalent in tropical and subtropical regions, where humans contact with contaminated soil. Despite its widespread occurrence, CLM is often unrecognized and hence, mismanaged at the primary health care (PHC) level. This paper aims to raise awareness among primary healthcare providers about CLM as a significant but often misdiagnosed condition. This case series describes the clinical manifestations of nine cases of CLM presented to three different PHC centers in Seeb Wilayat (Muscat) from December 2022 to May 2024. Written consents were taken from all the patients or their legal guardians to publish images of the lesion. Most the cases were followed up to evaluate any complications and ensure their full recovery. The nine patients were from different age groups ranging from two years to 36 years of age. The main clinical manifestation was itchy, creeping eruptions on the upper and/or lower limbs. The common source among the cases was contaminated water/soil from the 'wadi', after the rainy season. Treatment with albendazole (100-400 mg daily for 3-5 days) was effective in all the cases. One case required a dermatology referral due to persistent symptoms. This series highlighted CML as a skin condition that presents to PHC providers even in an urban city like Muscat. It also proved that early recognition and treatment with a short course of albendazole 400mg OD for five days is highly effective. It is recommended that such cases need to be notified electronically to enhance the national epidemiological statistics, as well as, to launch environmental eradication campaigns to eliminate its spread.

Keywords: Cutaneous Larva Migrans, CLM, Parasite, skin, Serpiginous Tract, Creeping Eruption Itching, Albendazole.

Introduction

Cutaneous Larva Migrans (CLM) is a parasitic skin infection caused by hookworm larvae, particularly Ancylostoma Braziliense and Ancylostoma Caninum.[1-3] Sometimes, it is also referred to as creeping eruption, sandworms, or plumber's itch.[1] Although CLM is prevalent in tropical and subtropical areas, increased international travel and global warming have led to a rise in cases outside these regions.[4,5]

The life cycle of the hookworm begins when adult worms lay eggs in the intestines of dogs and cats, which are then passed with their feces into the soil. Under favorable conditions in warm, moist soil, these eggs hatch,

and within a week, the larvae mature into the infective form.[6] Human infection typically occurs when their skin directly contacts the contaminated soil or sand, where the larvae penetrate through follicles, fissures, or even intact skin, of the feet, legs, buttocks, or back.[7] Then, the larvae migrate within the epidermis, leading to marked pruritus with characteristic erythematous serpiginous tracks.[8] Fortunately, these larvae are unable to complete their life cycle in the human body (accidental host), hence, they die within weeks of their invasion.[8]

Several risk factors contribute to the acquisition of CLM like walking barefoot on contaminated soil, as well as residing in areas with many stray domestic animals like dogs and cats.[6] Although CLM can occur across all ages and in both sexes, children in general, and boys in particular, are most frequently infected due to their increased risk of exposure to contaminated soil and their tendency to walk barefoot.[9] The diagnosis of CLM is primarily clinical, based on the appearance of the characteristic creeping eruption, proceeded by history of exposure to contaminated soil or puddles. However, it is essential to distinguish CLM from other dermatological conditions with similar presentation.[10] Dermoscopy can identify the larvae's body as an oval structure with a brown center and a yellow border.[11]

Despite being a self-limiting condition, where lesions typically resolve without treatment within 4–8 weeks,[12] CLM is often associated with severe itching that impacts the patient's life, and hence they seek medical attention. Yet, in non-endemic areas, it is misdiagnosed and hence inadequately treated.[13] Topical thiabendazole is an effective initial therapy for localized infections.[10,12] For multiple lesions or severe infestations, albendazole and ivermectin are considered first-line systemic therapies.[10] Cryotherapy is ineffective and should be avoided.[10]

About 13 unrelated cases of CLM were diagnosed at Seeb Wilayat in Muscat region, in three different nearby local health centers. Interestingly, all the cases were clustered between December 2022 and May 2024, following an air depression and hurricane affecting the Sultanate of Oman, accompanied by varying intensities of rainfall. However, due to refusal to consent, only nine cases will be presented in this series. These cases highlight the critical need for increased awareness and early recognition of CLM among healthcare providers, especially in regions where environmental conditions favor the transmission of this parasitic infection.

Case Report

The clinical details of the nine cases who gave consent for publication are summarized in Table 1.

Table 1: Shows detailed clinical manifestation, management and prognosis of the nine reported cases of CML

No.	Date	Age/ Sex	Presentation	Site	Duration	Treatment	Rereferral to dermatology	Outcome
1	19/12/2022	7 years boy	Itchy, raised erythematous serpiginous lesion noted after playing at the beach. (Figure 1a)	Lateral dorsal aspect of the right foot	1 week	Albendazole 400 mg OD for 5 days	No referral required	Significant improvement with minimal crusted patches remaining. (Figure 1b)
2	5/1/2023	3 years girl	Erythematous, serpiginous lesions with significant itching and discomfort.	Distal end of the right little finger and plantar aspect of the left foot	1 day	Albendazole 200 mg BID for 5 days	Yes, as per parents request during the second visit.	Lesions resolved completely after completing the course of albendazole, family canceled dermatology appointment.
3	8/1/2023	3 years girl (twin of case 2)	Severely itchy red serpiginous lesions.	Plantar aspect of both feet	Not documented	Albendazole 200 mg BID for 3 days, extended to 5 days with 400mg OD	No referral required	Complete resolution with no complications within 5 days of completing the albendazole course.

4	15/1/2023	36 years male	Itchy, serpiginous, moving skin lesions following cavalry training in heavy clay soil. (Figure 2)	Lateral and posterior sides of the right foot	2 weeks	Albendazole 400 mg OD for 3 days	No referral required	Complete resolution by day 3.
5	11/5/2023	9 years boy	Serpiginous, itchy erythematous skin lesions with scratch marks and skin peeling.	Both feet	Not documented	Albendazole 200 mg BID for 3 days extended to 5 days with 400mg OD	No referral required	Complete resolution by day 5.
6	22/5/2023	2 years boy	Ill-defined erythematous serpiginous tract appeared initially in the left hand palm and then moved towards the index finger. (Figure 3)	Left palm and index finger	1 week	Albendazole 100 mg OD for 3 days, extended to 5 days with 200mg OD + salicylic acid cream applied for 7 days	No referral required	Complete resolution by day 5.
7	2/2/2024	5 years boy	Itchy, serpiginous skin lesion; history of walking barefoot on the beach. (Figure 4)	Right foot	2 weeks	Albendazole 120 mg BID for 3 days + chlorpheniramine for 3 days.	No referral required	Follow-up was not conducted to ensure full recovery.
8	24/5/2024	8 years boy	Itchy, serpiginous tract with sensation of movement under the skin and blister formation .(Figure 5a)	Left wrist	3 days	Albendazole 400 mg OD for 3 days + antibiotics (amoxiclav). Dermatologist recommended topical therapy.	Yes, patient was seen in dermatology OPD and blisters were ruptured.	Improvement after dermatology consultation and topical therapy. (Figure 5b)
9	26/5/2024	34 year male	Severely itchy lesion spreading downward leaving dry, hyper pigmented areas. (Figure 6a)	Left forearm	1 week	Albendazole 400 mg OD for 5 days.	No referral required	Complete resolution by day 7. (Figure 6b)

Figure 1: (a) A worm-like appearance of a raised, erythematous lesion on the lateral dorsal aspect of the right foot. (b): Improvement of the lesion, leaving only minimal crusted patches.

Figure 2: A serpiginous, raised skin lesion on the lateral side of the right foot, accompanied by some skin peeling.

Figure 3: Ill-defined serpiginous tract crossing the left index finger.

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Figure 4: An erythematous thread-like skin lesion on the sole of the right foot.

Figure 5: (a) A serpiginous tract on the left wrist laterally with blisters and crusted brown skin patches at the previous sites. (b) Three days after the blisters were ruptured, the lesion showed improvement.

Figure 6: (a) Semi-circular, slightly raised lesion with erythema on the medial side of the left forearm. (b) Hyperpigmented patches on the medial side of the left forearm, 7 days after the treatment.

Discussion

In this case series, nine cases of CLM were reported through the period from 2022 to 2024 in some Seeb Wilayat Health Centers in Muscat, as summarized in Table 1. Oman is highly dominated by the hot desert climate where CLM is not commonly seen.[14] worth noting that the outbreak that happened in Seeb occurred mainly after periods of rainfall due to the air depression that impacted the Sultanate of Oman towards the end of 2022.[15]

In general, the most common presenting signs and symptoms among all the cases were itchy worm-like skin lesions mostly over the upper and lower limbs, noted most commonly among children. These findings match what was reported in the literature regarding the typical presentation and involved sites of CLM.[11,16] However, atypical presentation and location of CLM may occur, like one case who presented with a four-week history of skin eruption with severe itching on his back.[5] Additionally, similar to the existing literature, seven out of the reported nine cases (78%) were in pediatric groups with all cases having the lesions in upper and lower extremities, and 72%of the reported children were boys. The two reported adult cases shared a common factor which is a job involving contact with soil. One was a farmer and the other one enrolled in cavalry with training in heavy clay soil.

CLM is diagnosed mainly clinically as it was with all the reported cases, as none required enzyme-linked immunosorbent assay or skin biopsy, as they are considered invasive and better if avoided.[17]

Although cutaneous larva migrans is a self-limiting condition, healthcare providers typically prescribe antiparasitic drugs, readily available at local health centers, to eliminate hookworms and reduce the severity and duration of symptoms [12]. Oral albendazole, 400 mg daily for 3 to 5 days, is very effective with cure rates nearing 100%.[10] Most of the symptoms improved dramatically after a short course of oral albendazole 100-400 mg daily for 3-5 days along with symptomatic treatment, with no further intervention for most of the cases. However, it was noted that a 3-day course of albendazole was only effective in case #4, who is an adult, but was not sufficient in 78% of the cases, and needed to be extended to five days. Worth highlighting here is the discrepancy in prescribing the albendazole dose among general practitioners (GPs). In some cases it was prescribed as 200 mg BID and in others was 400 mg OD. The US CDC recommendation is 400 mg orally once a day for 3 to 7 days for adults and children aged > 2 years. Oral albendazole is contraindicated in children younger than 2 years; may use topical agents in such patients.[18]

From this series, it is recommended to treat CLM infection with albendazole 400 mg OD for five days, for better compliance and effective resolution of the infection.

There were no reported CLM local complications in this case series except in Case # 8, who developed blisters and required a dermatologist's opinion. However, it was noticed that he was prescribed oral antibiotics (amoxiclav) from the beginning along with albendazole, which may point to either a pre-existing or concomitant skin infection. Existing literature reported other local complications of CLM like persistent local skin allergies and non-resolving superadded skin infections like Staphylococcus aureus or streptococcus Pyogenes.[19] Moreover, CLM infection may lead to systemic complications like Loeffler's syndrome, which is a transient respiratory illness recognized by pulmonary infiltration along with peripheral eosinophilia after a parasitic infestation.[20] None of the cases reported here developed any systemic complication in further follow-up.

As mentioned earlier, all of the reported cases had a history of contact with water puddles or mud before the appearance of their symptoms. Moreover, all the reported cases, including the other three unreported cases, occurred shortly after hurricanes, air depressions, or heavy rainfalls. A thorough communication with the Department of Disease Surveillance and Control (personal communication, August 10, 2024) and with the Centre of Disease Control in Muscat (CDC) (personal communication, August 19, 2024), revealed no prior reported cases of CLM in Muscat region. This could either be due to under-diagnoses of CLM, or the lack of a proper reporting system. Hence, this case series highlights the need to raise the awareness of PHC providers about the disease and its management at their level of care. Additionally, there is an epic need to report outbreaks of CLM within cities, so that the ministry of health (MOH) can liaise with the municipality and the ministry of agriculture to tackle the issue and prevent further spread.

Conclusion

This series highlighted CML as a common skin condition that can present to PHC providers even in urban cities like Seeb in Muscat region. It also proved that early recognition and treatment with a short course of albendazole 400mg OD for five days is highly effective, with no need for further specialist referral. Continued Medical Education (CME) sessions need to include this topic to enhance the GPs competencies in managing cases of CLM with the best available practices. Furthermore, this series concludes that such cases need to be notified electronically to enhance the national epidemiological statistics, as well as launching environmental eradication campaigns to eliminate its spread. The multidisciplinary collaboration between MOH and other governmental institution is of paramount importance in the eradication of such parasitic infections.

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