Cutaneous Larva Migrans

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Continuing Education Activity

Cutaneous larva migrans (CLM), also having been termed for the clinical sign of creeping eruption, is an infectious syndrome caused by multiple types of hookworms. This is most commonly transmitted by animal feces depositing eggs in the soil, with larvae entering humans through direct contact with skin. Cutaneous larva migrans is distinguished from the cutaneous manifestation of Strongyloides stercoralis infection termed larva currens. The latter demonstrating fast movement through the skin. Other non-larval cutaneous migrations, including loiasis, scabies, or larva with dermal penetration, are also excluded from CLM. This activity describes the clinical evaluation of cutaneous larva migrans and explains the role of the health professional team in coordinating the care of this condition.

Objectives:

- Review the cause of cutaneous larva migrans.
- Describe the presentation of cutaneous larva migrans.
- Summarize the treatment of cutaneous larva migrans.
- Outline the clinical evaluation of cutaneous larva migrans and explain the role of the health professional team in coordinating the care of this condition.

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Introduction

Cutaneous larva migrans (CLM), also having been termed for the clinical sign of creeping eruption, is an infectious syndrome caused by multiple types of hookworms. This is most commonly transmitted by animal feces depositing eggs in the soil, with larvae entering humans through direct contact with skin. Cutaneous larva migrans is distinguished from the cutaneous manifestation of *Strongyloides stercoralis* infection termed larva currens. The latter demonstrating fast movement through the skin. Other non-larval cutaneous migrations, including loiasis, scabies, or larva with dermal penetration, are also excluded from CLM.[1]

- This disease is classically seen in warmer climates, including the southeast United States. Latin America, Southeast Asia, and Africa.
- Symptomatology includes a progressive migrating serpiginous rash commonly with pruritus. While the disease can affect any exposed area, the most common location is the feet.
- The natural progression of the disease is self-limited as the organisms are unable to produce a collagenase to penetrate the basement membrane and reach the gastrointestinal (GI) tract to reproduce. When treatment is given, topical thiabendazole, oral albendazole, or ivermectin are the drugs of choice.
- Complications often arise from secondary bacterial superinfection or complications from inappropriate empiric therapy.[1], [2], [3]

Etiology

CLM is a clinical manifestation demonstrated by creeping migration of larva through the skin. Organisms include animal vector nematode hookworms *Ancylostoma braziliense, Ancylostoma caninum,* and *Uncinaria stenocephala*. Human hookworms *Ancylostoma duodenale* and *Necator americanus* also can cause disease.[4]

Epidemiology

Organisms responsible for the disease are most commonly found in tropical climates such as the southeastern United States, Latin America, the Caribbean, Southeast Asia, and Africa. The prevalence of the disease is often highest during wet seasons. Tourists traveling to endemic areas who are affected have been tended to be younger.[1][3]

Pathophysiology

Adult hookworms live in the intestines of dogs and cats. Eggs are shed in feces and after deposition into the soil hatch within one day. Over the course of the proceeding week, these develop into infective larvae. Worms respond to physical vibration and increased temperature and move in a

snake-like fashion. Upon contacting a host organism, penetrate the corneal layer by secreting a hyaluronidase. Despite burrowing through the superficial cutaneous layers, they are unable to penetrate the basal membrane to enter lymphatics are, therefore, are unable to complete their lifecycle. Hookworms subsequently die without reproducing, and disease is self-limited.[1][2][4]

Histopathology

Biopsy of affected areas show the larvae in the epidermis or below surrounded by eosinophilic infiltrate. Spongiotic dermatitis with vesicles containing neutrophils and eosinophils may also be present.[2][5]

History and Physical

Patient history often involves travel to endemic areas and a history of walking barefoot. The most common initial finding is a small reddish papule that progresses to a serpiginous pruritic rash with a slow rate of progression from less than 1 to 2 cm per day. The initial presentation may vary depending on species. Disease from *A. braziliense* manifests within 1 hour, while papular lesions may take days to appear when *U. stenocephala* is the organism that infects a person. Vesiculobullous disease may occur as well, and papulopustular inflammation of the follicles has been documented, although this is not common.[2][6][7]

Evaluation

Diagnosis is usually made clinically based on the history of recent travel to endemic areas in combination with a classic serpiginous rash. The rash is very pruritic, raised, and has a slower rate of millimeters up to 2 cm per day. This distinguishes it from other migrating infections. Blood tests are not necessary for diagnosis. Not only is eosinophilia found in less than 40% of patients with CLM, but it is also not specific. Non-invasive optical coherence tomography has been used to establish the diagnosis, although this is not often used. Skin biopsy is occasionally performed and may reveal the nematode larvae within a circular canal. A biopsy is not sensitive, and while secondary changes and infiltrate assist in diagnosis, it is not necessary to confirm this clinical diagnosis.[2][5]

Treatment / Management

The disease is self-limited; however, if the infection is local, topical thiabendazole 10% solution or 15% ointment may be tried first. The cream is applied 2 to 3 times daily for 5 to 10 days. Small studies have shown improvement of pruritus may occur as early as 48 hours after beginning treatment, and cure rates as high as 98% within ten days have been achieved. The largest advantage of topical therapy is a lack of systemic absorption and side effects. Still, the use is limited by multiple applications daily, and utility is less valuable with multiple lesions.

Local disease has historically been treated with cryotherapy. However, freezing the leading edge of the skin with either liquid nitrogen, solid carbon dioxide, or ethylene chloride spray has been shown to be largely ineffective and should be avoided.

For multiple lesions or severe infestation, albendazole and ivermectin are first-line systemic therapies. Oral albendazole, 400 mg daily for 3 to 5 days, is very effective with cure rates nearing 100%. Some studies show that a 7-day course of albendazole may decrease the rates of recurrent disease. Oral ivermectin is also effective, and its advantage is a patient only has to take a one-time dose of 12 mg by mouth. Cure rates near 100% with ivermectin administration.

Mebendazole is another antihelminthic agent; however, it has poor bioavailability, absorption, and, subsequently, poor efficacy and should not be used as a first-line medication. Also ineffective include topical steroids, oral steroids, and antibiotics. While systemic corticosteroids may reduce itching, the side-effect profile limits usefulness.

In addition to pharmacologic therapy, banning dogs from beaches may decrease the deposition of larvae into the soil. Notably, towels do not consistently protect against transmission, but wearing protective footwear can be effective. [3][4][6][7][8]

Differential Diagnosis

While the creeping eruption and clinical signs lead to a diagnosis in most cases, other organisms may be confused about this infective processes. Scabies, loiasis, myiasis, schistosomiasis, tinea corporis, and contact dermatitis may have some overlapping features. These are all easily differentiated by a lack of serpentine migration. The most similar disease is the migrating lesion of *Strongyloides stercoralis*, termed larva currens. This progressing serpiginous infection is differentiated by its rate of progression with intermittent movement and rates of several centimeters by the hour. Additionally, the pattern is haphazard, and disease more often occurs on the perianal skin, thighs, or the trunk. A human

trematode, *Fasciola gigantica,* causes a disease called fascioliasis and is also in the differential. Non-infectious linear or serpiginous dermatoses include jellyfish stings, lichenoid eruptions, and phytophotodermatitis, which again are non-migratory. Creeping ingrown hair may present but is rare. [2][4][6]

Prognosis

The disease is often self-limited, and resolution without treatment is the rule rather than the exception. However, migration may continue for months, and during this time, pruritus may be severe, often interfering with sleep. Treatment, topical or systemic results in cure rates near 100%, and although recurrence can occur, it is also well prevented and responsive to systemic therapy.[3][6][7]

Complications

Complications include secondary infection, most commonly with *Staphylococcus aureus and Streptococcal* species. Secondary impetiginization occurs in up to 8% of cases. If the infection is prolonged post-streptococcal glomerulonephritis has been reported. Although it is well accepted that larvae cannot penetrate the basement membrane of skin, visceral disease has been rarely reported. Larvae have been identified in sputum, found in viscera of a human host, and also found in skeletal musculature. Host response to infection has rarely occurred as erythema multiforme. [9]

Enhancing Healthcare Team Outcomes

The interprofessional healthcare team, including clinicians, pharmacists, and nurses should work together to help educate the public on strategies to avoid this disease in endemic areas as well as the importance of following treatment guidelines. While the clinician directs the course of treatment, dermatology nurses provide education, monitor patients, and educate patients and their families. Pharmacists review medications, check for drug-drug interactions, and provide patient and family education. WIth an interprofessional team approach, these cases can achieve better outcomes. [Level 5]

Review Questions

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