BRIEF ARTICLE

A Case of Zoonotic Domestically Acquired Hansen Disease (Leprosy) in the State of Georgia

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ABSTRACT

Introduction: Hansen Disease (HD) is an infection of the bacteria *Mycobacterium leprae* causing rash and anesthesia of the skin. It is endemic to many developing countries, where it is spread by direct contact. Zoonotic transmission through the 9-banded armadillo (*Dasypus novemcinctus*) has been documented in North America. HD is rare in the state of Georgia and most cases are from individuals travelling from HD endemic regions.

Case Report: The patient developed red, infiltrated, anesthetic plaques covering 20% of her body. Fite staining revealed *mycobacterial organisms* suggesting lepromatous HD. The patient had no relevant history of travel or personal health history. The patient gardened outdoors in Southern Georgia. She knew armadillos were present in the area, but she did not have direct contact with one. The suspected mode of transmission was through feces of an infected armadillo in the soil. The patient is being treated with a 2-year course of rifampin, clofazimine, and dapsone, and reports improvement.

Discussion: Domestically acquired HD is generally seen in other Southern states with greater armadillo populations. The range of the 9-banded armadillo is expanding, which potentially puts a greater area of the country at risk for exposure to HD. Therefore, increasing resources for treatment of HD is important.

Conclusion: This case report presents a case of HD with indirect zoonotic transmission.

INTRODUCTION

Hansen Disease (HD), formerly known as Leprosy, is a chronic infection caused by *Mycobacterium leprae* or *M. lepromatosis* which are obligate intracellular, acid-fast, gram-positive bacteria. HD primarily affects the skin and peripheral nervous system presenting as a rash causing anesthesia of the skin.¹ Despite being declared by the World Health Organization (WHO) as no longer being a global public health problem, HD remains endemic in many developing

countries including India, Brazil, Indonesia, Bangladesh and Ethiopia. 80% of total cases occur in these countries.² Most cases spread via direct human contact, with zoonotic transmission only being confirmed in North America. Zoonotic transmission of M. leprae through armadillos, limited leprosy expertise, and research gaps have all been identified as major challenges by the WHO in their "Towards Zero Leprosy" strategy plan.³ As important such. it is to highlight autochthonous cases of HD in non-endemic regions.

HD is not common in the United States (US). Of the approximately 150 new cases reported yearly, most are in patients coming from HDendemic areas. However, there is a known zoonotic reservoir of M. leprae in the US found in the 9-banded armadillo (Dasypus novemcinctus), native to some Southern states including Texas and Louisiana.⁴ The zoonotic mode of transmission of HD is not understood. It has completelv been described through skin-to-skin contact with armadillos, and indirect contact through M. leprae living in soil.⁵ From 2000 to 2018, there were 52 cases of HD reported in the state of Georgia. Of those, only 9 were acquired domestically.⁶ This report presents a patient with lepromatous HD acquired through indirect armadillo exposure.

CASE REPORT

The patient's first symptom was soreness of the right arm which became red, swollen and developed a pins-and-needles feeling over the next two days. Over the next week the area became fully anesthetic, and bright red plaques spread to both arms, back, buttocks, posterior legs, and feet. After two rounds of steroid injections with primary care, the patient was referred to dermatology. By this time, large, firm, warm, infiltrated plaques had spread throughout the body and face, affecting approximately 20% of body surface area. Although the diagnosis of HD was considered, it was deemed unlikely without history of travel to HD endemic destinations or personal exposures. 6mm punch biopsies were taken on active lesions of the inferior back and posterior right upper arm, revealing a granulomatous infiltrate in the dermis. Fite stains performed on the biopsies showed evidence mycobacterial organisms. of suggesting lepromatous HD (Figure 1).

The patient is an otherwise healthy 64-yearold woman with no history of travel to HD endemic regions or known contact with individuals with HD. The patient grew up in rural southern Georgia and moved to a metropolitan area in northern Georgia in adulthood. She visits family in her hometown monthly where she gardens outdoors and brings plants back home. She is aware that armadillos are present in her family's garden but has never directly come into contact with one. We suspect that exposure to armadillo feces from contact during gardening or exposure to aerosolized, contaminated soil in closed vehicles were the cause of infection. To date, none of her family members have been infected.

Treatment

The patient was promptly seen by an infectious disease doctor with expertise in HD and was treated with rifampin (600mg once monthly), clofazimine (50mg once daily), and dapsone (100mg once daily). She is to remain on this course of antibiotics for two years, though the dose of dapsone was decreased to 75mg. The patient began a sixweek course of prednisone to treat edema of the arms of feet which was discontinued after four weeks due to side effects.

Four months into her treatment, the patient had significant improvement in most symptoms (Figure 2). She currently experiences edema of the left foot. anesthesia in toes and tip of nose, and inability to breathe through left nostril due to swelling. She has alopecia on the right arm which began after experiencing erosion of the skin in that area.

DISCUSSION

This case presents an unusual method of exposure without any recent foreign travel or November 2024 Volume 8 Issue 6

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Figure 1. Fite stain (400x) of skin biopsy showing numerous mycobacterial organisms (shown in red) suggesting lepromatous Hansen's Disease.



Figure 2. Patient with Hansen's disease before beginning treatment with large, infiltrated plaques covering back (A) and arms (B) and after 4 months of treatment with rifampin, clofazimine, and dapsone (C and D).

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exposure to individuals with HD. Domestically acquired cases in the US tend to occur in states with bigger armadillo populations and come from more direct contact with armadillos. This case may be evidence of the spread of HD in the US with changes in the armadillo population. Ninebanded armadillos were first recorded in the US in Texas, but their range has since expanded North and East, possibly due to climate change.⁷ This pattern may put new parts of the US at risk for exposure to HD where local zoonotic transmission was previously impossible.

Multidrug therapy (MDT) is the standard treatment for HD that has greatly reduced morbidity and mortality of HD. Rifampin, clofazimine, and dapsone work together to treat the infection and decrease chances of relapse or resistance.⁸ Patients often report side effects that are difficult to tolerate with these drugs. Our patient experienced dapsone-induced macrocytic anemia and intense gastric intolerance caused on rifampin. Clofazimine commonly causes distinct changes in skin pigmentation which further contributes to stigmatization of the disease. Other combination of antibiotics such as rifampin, ofloxacin, and minocycline exist in treatment of HD that mitigate these side effects.9

Currently, the only HD clinic in the US is in Baton Rouge, Louisiana, which is where the Carville National Leprosarium housed patients until 2001¹⁰. Some ambulatory care clinics exist in major US cities with signification immigration from HD endemic countries. However, greater resources including more clinics and better education for medical providers may be necessary if HD continues to spread to new areas of the country.

CONCLUSION

HD, caused by *M. leprae*, is an infection of the skin and peripheral nervous system. While it is more commonly seen in certain US states, HD is rarely found in Georgia. This case report describes a woman in Georgia who was infected with HD through indirect contact with armadillos and is receiving MDT. Researching cases of HD in non-endemic regions is important in the greater effort to educate medical providers about and increase awareness of neglected tropical diseases that are difficult to promptly diagnose.

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