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Case Series

Lessons about Continued Challenges of Diagnosis and Treatment of Pediatric Leprosy: Case Reports of Possible Intra-familial Transmission

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Leprosy, caused by *Mycobacterium leprae*, is a chronic infectious disease that primarily affects the skin and peripheral nerves. Children are more vulnerable to acquire the infection because of their naïve immunity and possible intra-familial contact. This article discusses two pediatric cases of leprosy in siblings, highlighting the clinical presentations, diagnostic challenges, and the importance of early detection and treatment in preventing long-term complications. The father of children could be source of infection as he was stated to have leprosy like lesions for several years. School health screening programme had failed to suspect leprosy indicating the need to augment their expertise to identify such cases.

Keywords: Leprosy, Hansen's Disease, Children, Challenges, Intra-familial Contact

Introduction

Leprosy remains a public health concern in many regions, particularly in developing countries. Although it is largely preventable and treatable, late diagnosis can lead to significant morbidity, including nerve damage and deformities. Member countries of WHO are committed to reduce the leprosy burden to end the disease from the world (WHO 2018 a, b). Ending the transmission is the most important step to achieve the eradication of the disease (WHO 2018b). Pediatric leprosy is particularly concerning as it can result in lasting disabilities if not addressed promptly. There have been several publications on childhood cases from specialized centres (Nair 2017, Uikey et al 2020, Parsam & Kadi 2022). The issue especially the diagnostic and management aspects have been analysed in important review articles (Narang & Kumar 2019, Pradhan et al 2019).

This article presents two cases of pediatric leprosy in siblings, indicating recent transmission of the disease by an active source of infection.

Case Summaries

Case 1:

A 7-year-old boy was referred by District Leprosy Officer to our hospital for slit skin smear and confirmation of Hansen's disease. He was brought to the outpatient department by his mother, complaining of light-colored skin lesions over his

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buttocks for the past 4 months. He did not report any tingling, numbness, or systemic symptoms. Notably, similar lesions had been present on his father for nine years. He was initiated treatment but had poor compliance. The boy had not been in contact with his father for the past two years due to personal issues. His mother noted similar lesions on her daughter for two years, which had been misdiagnosed and treated as a fungal infection at a nearby clinic.

Upon examination, the boy had multiple well-defined hypopigmented plaques measuring 4*4 cm to 6*6 cm, located on the lateral aspect of his left arm, bilateral gluteal region,

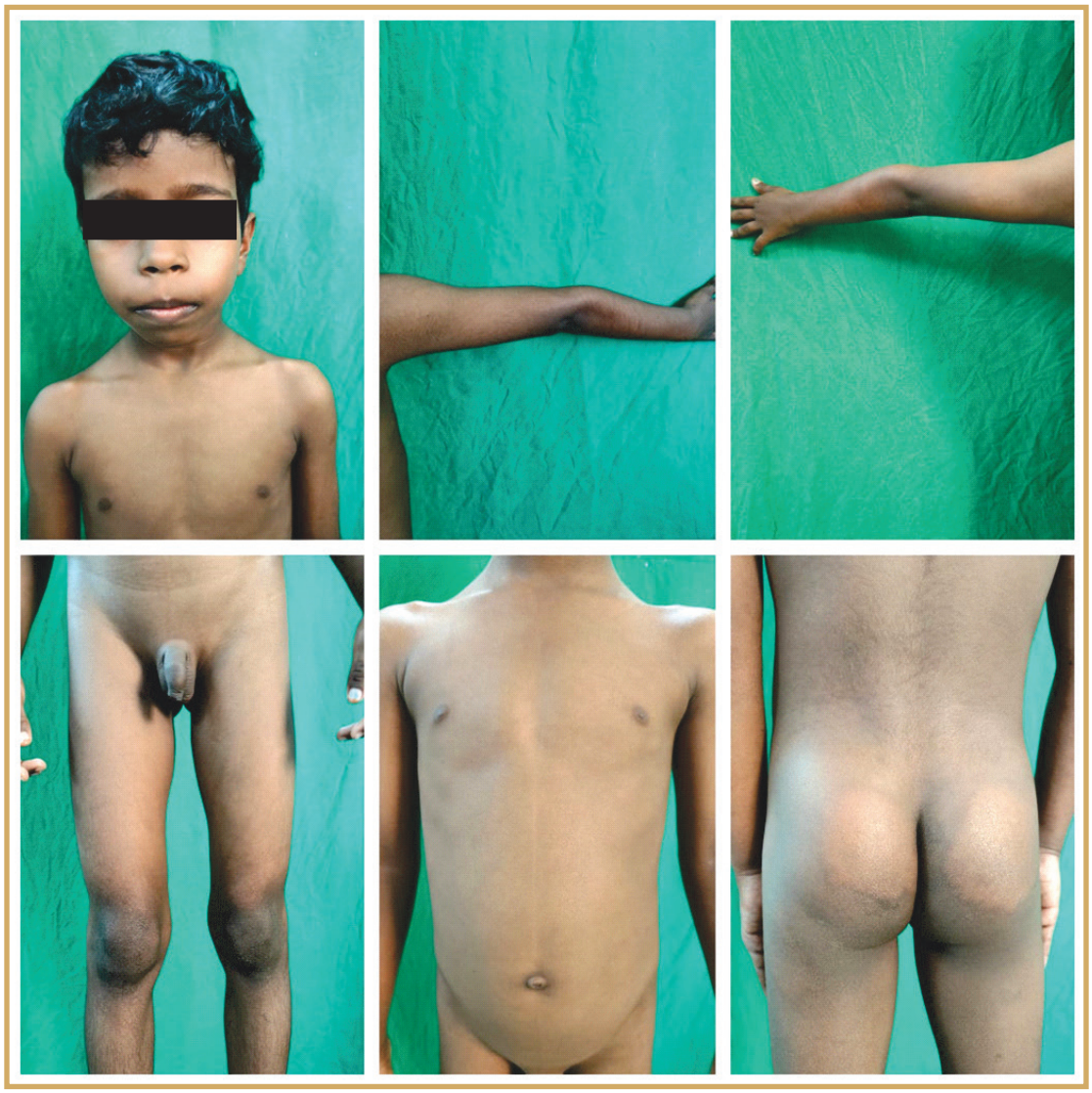

Fig. 1 : Well-defined hypopigmented plaques on the lateral aspect of patient's left arm, anterior aspect of both thighs and bilateral gluteal region (Case 1).

and anterior aspect of both thighs (Fig. 1). The plaques exhibited slight infiltration at the edges but were non-tender, with no erythema or edema. Mild infiltration was noted over the left ear, and there was grade 1 thickening of the bilateral ulnar, common peroneal, and posterior tibial nerves. Sensory testing was challenging due to the child's age, but corneal sensation and voluntary muscle testing were normal. The Eye-Hand-Foot score was 0/12. Basic blood investigations were unremarkable. Slit skin smear revealed a bacteriological index of 0.83, leading to a diagnosis of multibacillary leprosy with borderline tuberculoid spectrum. The child was

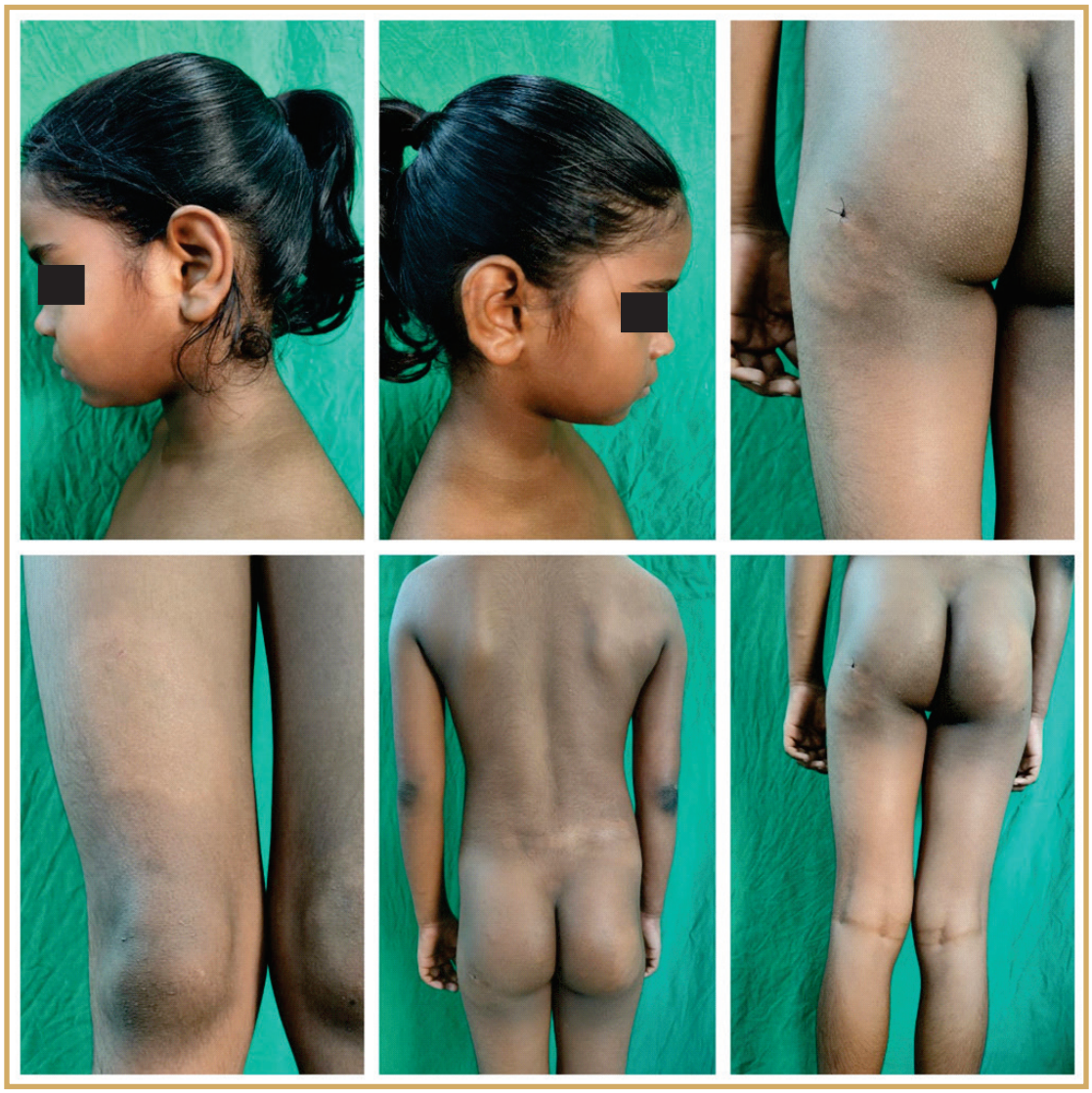

Fig. 2 : Hypopigmented plaques on left face, right thigh, back and bilateral gluteal regions of Case 2.

initiated with multibacillary multidrug therapy according to weight and is under regular follow-up. He has completed 9 months of follow up.

Case 2

The 8-year-old sister of the boy was also presented by their mother, with complaints of light-colored skin lesions on her face, thighs, and buttocks for past two years. School screening programme (RBSK) had been done but the lesions were diagnosed as Tinea corporis. Similar to her brother, she had been treated intermittently with topical antifungals without significant improvement. The child was referred to District Leprosy Medical Officer by her paediatrician as a suspected case of leprosy and he further confirmed the diagnosis clinically. Clinical examination revealed multiple hypopigmented plaques ranging from 2*2 cm to 5*5 cm on her left face, forearm, bilateral thighs, abdomen, and back (Fig. 2). There was grade 1 thickening of bilateral ulnar, radial cutaneous, common peroneal, and posterior tibial nerves. The Eye-Hand-Foot score was 0/12.

Sensory and voluntary muscle testing results were normal, and blood investigations showed no abnormalities. Slit skin smear was positive at all sites with a bacteriological index of 2.6, and histopathological examination suggested tuberculoid leprosy. She was diagnosed as untreated multibacillary leprosy with borderline tuberculoid spectrum. Like her brother (Case 1), she was also reported to the District Leprosy Medical Officer and were initiated treatment with the MB-MDT child kit according to their weight.

After 2 months of MB-MDT, the child presented with fever and vomiting. The child was icteric and pale with haemoglobin was 7.8g/dL, Total bilirubin 2 mg/dL, LDH 567 mg/dL and CRP was positive, 24mg/dL. Peripheral smear showed severe dimorphic anemia (Normocytic normochromic anemia and microcytic hypochromic anemia) with reactive lymphocytosis. Reticulocyte count -2.5%. USG abdomen and pelvis showed minimal ascites. The diagnosis was made as dapsone induced hepatitis and the drug was withheld. The child was conservatively managed as inpatient in pediatric ward and was continued with clofazimine and rifampicin. Serial blood investigations showed drop in bilirubin levels and the child was discharged in good condition. The child was asymptomatic and better during all follow up visits for the past 9 months.

Contact screening and chemoprophylaxis: Single dose rifampicin (SDR) chemoprophylaxis was given to all family contacts, relatives of the children, neighborhood contacts. All available contacts were screened by the district leprosy team headed by the District Leprosy Medical Officer.

Discussion

Diagnosis of leprosy is primarily based on cardinal signs, including anesthetic skin lesions and enlarged or tender peripheral nerves, along with a positive slit skin smear for acid-fast bacilli. Ending the transmission is a global goal (WHO 2018a) and for this purpose childhood leprosy assumes great importance all of the world (Olivieira & Diniz 2016, WHO 2018a, Pradhan et al 2019). Eliciting sensory loss in children can be particularly difficult, as they may not be able to accurately report sensations. While pain sensation tends to be the last to diminish, temperature sensation can be more easily assessed using test tubes of warm and cold water.

The delay in diagnosis in these cases is mainly patient-related due to poor socio-economic status and relationship issues as was observed in this case series. The parents were separated and the mother being single without any family support was feeling depressed and so she did not seek any active medical advice/ intervention for the skin lesions.

There are many difficulties in the diagnosis and management of leprosy in children (Nair 2017, Narang & Kumar 2019, Pradhan et al 2019, Uikey

et al 2020). In cases of uncertainty, a biopsy may confirm the diagnosis; studies indicate that 35% of such cases show histological evidence of Hansen's disease. There is low clinic-pathological co-relation in childhood leprosy, possibly due to non-specific histological features and poor immune response in children. Selection of biopsy site is also crucial for diagnosis. In indeterminate lesions, biopsy should be taken at the centre of lesion where the disease progression is active. In well-defined lesions with infiltrated borders, biopsy should be taken from the border of lesion. Slit skin smear is typically positive in lepromatous (LL), borderline lepromatous (BL) and borderline tuberculoid (BT) cases. A significant proportion of early childhood cases remain AFB negative ranging from 17.4 – 30%. Slit skin smear positivity tends to increase with age.

Interestingly, many pediatric leprosy cases demonstrate self-healing skin lesions, allowing for a period of observation in doubtful cases. Spontaneous regression occurs in 33-75% of cases. Approximately 30% of indeterminate cases progress to a determinate type. However, in endemic regions or when family members are affected, early treatment is advisable. The risk of developing leprosy is four times with neighborhood contact and nine times with intra familial contact.

Leprosy in children often signifies recent transmission. Delayed diagnosis can result in disabilities with significant psychosocial and financial repercussions for affected families. Moreover, social stigma may deter families from seeking timely medical intervention. Parents should be educated about the treatment duration and the importance of completing the full course without interruption. Additionally, they need to be made aware of the signs and symptoms of lepra reactions and instructed to report any such occurrences to their physician immediately. For children with anesthetic hands and feet, parents should receive guidance on how to care for these areas to prevent trophic ulcers. Furthermore, it is essential to examine the parents and siblings of the index case for leprosy. As such children may be under the care of pediatricians, their involvement is of paramount importance.

To address these challenges, effective public health strategies are essential. Regular school and contact surveys can aid in early case detection. Continued MDT administration, alongside new preventive approaches, is crucial for breaking transmission chains and striving for leprosy elimination. In addition, chemoprophylaxis of close contacts of newly diagnosed cases with single dose of rifampicin should also be considered as a preventive measure as per recommendations of national leprosy eradication programme (NLEP) of India.

There are several strategies in NLEP being implemented by Government of India for early detection and timely management of leprosy in the community (NLEP website). The three-pronged strategy includes leprosy case detection campaign (LCDC) during which 14 days active case detection campaign in high endemic districts is being done, Focused Leprosy Campaigns (FLC) in non-endemic districts, Special plan for hard-to-reach areas and single dose rifampicin (SDR) implementation to eligible contacts of new cases has been implemented. Sparsh Leprosy Awareness Campaign (SLAC) is done to increase the awareness, addressing high level of stigma & discrimination. Nikusth2 is an integrated portal where real time monitoring of leprosy patients across the country is being done, facilitating better monitoring and evaluation of NLEP. ASHA based Surveillance for Leprosy Suspects (ABSULS) prioritises leprosy case detection by ASHA & treatment follow-up. Convergence of leprosy screening under major programmes of National Health namely, Ayushman Bharat - Community Based Assessment Checklist (CBAC) to screen

30+ people at Health and welfare centres and Rashtriya Bal Swasthya Karyakaram (RBSK) to screen children in schools and anganwadis by medical officers twice a year. Convergence under Rashtriya Kishore Swasthya Karyakaram (RKSK) enables screening and counselling of adolescent children and is going on since 2020. Furthermore, Immunoprophylaxis with *Mycobacterium indicus pranii* (MIP) vaccine, detailed investigation of Grade II disability cases, drug resistance surveillance, active case detection and regular surveillance (ACD & RS) are being done/ recommended strategies under the National Strategic Plan and roadmap (NSP 2023-2027) of Govt of India under NLEP to eradicate leprosy from India.

Conclusions and way forward

Pediatric leprosy poses significant challenges in diagnosis and management, particularly when misdiagnosed as other skin conditions as was seen in one of two cases reported here. The presented cases illustrate the need for heightened awareness and early intervention to mitigate the impact of this disease. Treatment related issues like dapsone hypersensitivity can be managed if diagnosed in time. Timely diagnosis and initiation of multidrug therapy can lead to favorable outcomes and prevent disabilities associated with leprosy. Public health initiatives should focus on education and surveillance to promote early detection and treatment within communities especially in endemic areas. Active search for the index case and breaking the chain of transmission should be given utmost importance to achieve 'Leprosy free India' which is the vision of National Leprosy Eradication Program.

References

1. Nair SP (2017). A clinico-epidemiological study of pediatric leprosy in the urban leprosy center of a tertiary care institute. *Indian J Paediatr Dermatol*. **18(1**): 24-27.
2. Narang T, Kumar B (2019). Leprosy in children. *Indian J Paediatr Dermatol*. **20(1**): 12-24.
3. National Leprosy Eradication Programme. Directorate General of Health Services, Ministry of Health & Family Welfare, Govt of India. https://dghs.mohfw.gov.in
4. National strategic plan and roadmap for leprosy 2023-2027. National Leprosy Eradication Programme. Central Leprosy Division, Directorate General of Health Sciences, Ministry of Health and Family Welfare, Government of India. Available from: *https://dghs.gov.in/WriteReadData/userfiles/file/Leprosy%20New/NSP%20%20Roadmap%20for%20Leprosy%202023-2027.pdf*, accessed on December 28, 2023.
5. Oliveira MB, Diniz LM (2016). Leprosy among children under 15 years of age: Literature review. *An Bras Dermatol*. **91**: 196–203.
6. Parsam SB, Kadi R (2022). Clinicoepidemiological profile of childhood leprosy in a tertiary care hospital of North Karnataka. *Indian J Paediatr Dermatol*. **23(4):** 288-291.
7. Pradhan S, Nayak BP, Dash G (2019). Childhood leprosy: A review. *Indian J Paediatr Dermatol.* **20(2):** 112-116.
8. Uikey D, Joshi R, Verma N (2020). A case series of pediatric leprosy. *Indian J Paediatr Dermatol*. **21(1**): 66-69.
9. World Health Organization – WHO (2018a). Neglected Tropical Diseases, Leprosy: World Focused on Ending Transmission among Children, Last accessed on 2018 Apr 10, Available from: http://www.who.int/neglected_diseases/news/Leprosy_ending_transmission_among_children/en/
10. World Health Organization – WHO (2018b). Global leprosy update, 2017: Reducing the disease burden due to leprosy. *Wkly Epidemiol Rec*.**93**:445–456; Available from: http://www.who.int/wer; Last accessed 2018 Sep 03.

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