

## CLINICO-EPIDEMIOLOGICAL STUDY OF CHILDHOOD LEPROSY AT A TERTIARY CARE CENTRE IN CENTRAL INDIA / CHHATTISGARH

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### Abstract

**Background:** Leprosy is a chronic infectious disease caused by Mycobacterium leprae which cause damage to the skin and peripheral nerve. Childhood leprosy indicates transmission of disease in a community. Therefore, it is important to identify factors responsible for childhood leprosy in high endemic zones. The aim to study clinico-epidemiology of childhood leprosy at a tertiary care center in central India. **Materials and Methods:** A retrospective study of childhood leprosy cases attending the Dermatology Department of LSLAM Medical College and Hospital, Raigarh, Chhattisgarh from January 2022 to December 2023 was conducted. The socio-demographic data, treatment history, contact history, site of skin lesions, nerve involvement, clinical classification, presence or absence of lepra reaction and disabilities, were taken from the Leprosy Register of the hospital. The data obtained was tabulated in Microsoft excel and analysed. **Result:** A total of 291 cases of leprosy were registered during the study period of 2 years, among which 22 cases were that of childhood leprosy (7.56%). There were 9 males (40.9%) and 13 females (59%). Majority of patients in our study (77.2%) belonged to the age group of 11-17 years. Most of the patients belonged to rural areas. Only 3 patients had a definite history of contact with leprosy patients in their household. Trunk was the commonest site involved. The ulnar nerve was the most common nerve affected. A total of 81.8% patients were suffering from borderline tuberculoid leprosy, while tuberculoid and lepromatous leprosy was observed in 9% and 4.54% cases of childhood leprosy. **Conclusion:** The childhood leprosy cases in our study are suggestive of increased transmission of leprosy. This study highlights the need for targeted leprosy control activities at high endemic states in India.

## INTRODUCTION

Leprosy is a chronic infectious disease caused by Mycobacterium leprae which cause damage to the skin and peripheral nerve. Leprosy is an endemic disease in India accounting for 80% of the global leprosy caseload.<sup>[1]</sup> Leprosy affects all age group, but leprosy in children is crucial as it indicates transmission of disease in a community. As per National Leprosy Elimination Programme (NLEP), India has achieved the goal of elimination of leprosy in December 2005. As of 2021-22, Chhattisgarh and Dadra & Nagar Haveli are yet to achieve leprosy elimination. The annual new case detection rate (ANCDR) of leprosy in India is 8.13 per 100000 as

of 2019-2020, among all states and union territory Chhattisgarh reports highest ANCDR (29.7, and prevalence of 2.3 per 10000).<sup>[2]</sup> Children are among the vulnerable group to infection with *M. leprae* due to their poorly developed immunity and exposure to household contacts. Hence, it is important to identify factors responsible for childhood leprosy in high endemic zones. The early diagnosis and treatment of childhood leprosy will prevent disabilities and deformities among children thereby reducing the physical, psychosocial and economic burden of the disease. This study aimed to identify the clinico-epidemiological trend of childhood leprosy at a tertiary care centre in Chhattisgarh.

## MATERIALS AND METHODS

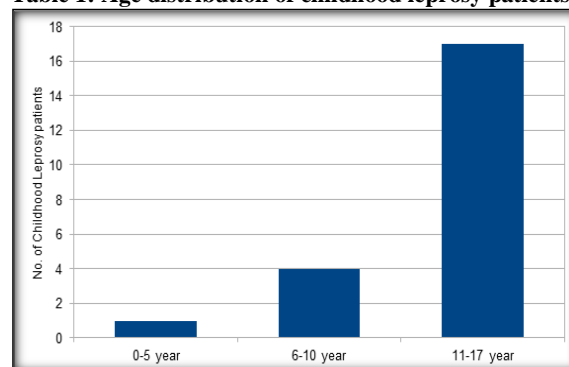
A retrospective study of childhood leprosy cases attending the Dermatology Department of LSLAM Medical College and Hospital, Raigarh, Chhattisgarh from January 2022 to December 2023 was conducted. Ethics approval was taken from the Institutional Ethics committee. The data of childhood leprosy cases who were less than or equal to 17 years of age, was analysed. The case detection was passive, and no active search was carried out. The detailed history as noted in the records, and the examination findings were recorded and analysed. All data regarding age, sex, residence, history of any other person in family who was diagnosed with leprosy, or had treatment of leprosy earlier, household contacts, site of skin lesions, nerve involvement, clinical classification, presence or absence of lepra reaction and disabilities, were taken from the Leprosy Register of the hospital. Detailed note of the examination findings included site of skin lesions, peripheral nerve thickening, sensory examination, motor examination, signs suggestive of type 1 and type 2 reactions, presence of neuritis and disabilities. Standard criteria for diagnosis and classification of Ridley & Jopling was followed. The clinical types diagnosed included lepromatous leprosy (LL), borderline lepromatous (BL), mid borderline (BB), borderline tuberculoid (BT), tuberculoid (TT). The data obtained was tabulated in Microsoft excel and analysed.

## RESULTS

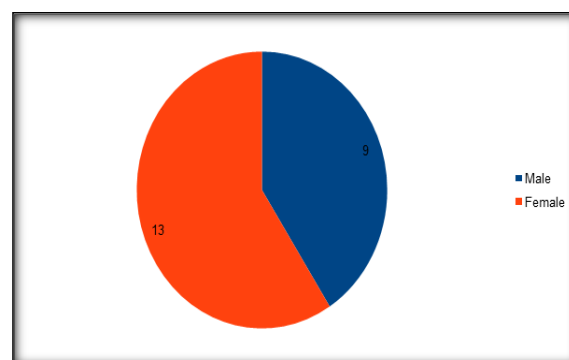
A total of 291 cases of leprosy were registered during the study period of 2 years, among which 22 cases were that of childhood leprosy (7.56%). There were 9 males (40.9%) and 13 females (59%) [Figure 1] depicting sex distribution of childhood leprosy cases). Majority of patients in our study (77.2%) belonged to the age group of 11-17 years [Table 1] depicting age distribution of childhood leprosy patients) followed by (18.1%) in 6-10 years, while (4.5%) cases belonged to 0-5 years of age group. Most of our patients belonged to rural areas (17,77.2%) and (5,22.7%) cases were from urban areas [Figure 2] depicting area-wise distribution of childhood leprosy cases). Only 3 patients (13.6%) had a definite history of contact with leprosy patients in their household. Trunk (45.4%) was the commonest site involved followed by face (36.3%), arm and forearm (18.1%), thigh and leg (13.6%) [Table 2] depicting Site of involvement among childhood leprosy cases). A total of 81.8% patients were suffering from borderline tuberculoid leprosy, while tuberculoid and lepromatous leprosy was observed in 9% and 4.54% cases of childhood leprosy [Table 3] depicting distribution according to clinical type of childhood leprosy). The ulnar nerve was the most common nerve affected (22.7%), radial cutaneous nerve and common peroneal nerve were

thickened in 4.54% cases equally, while 68.1% cases did not have any nerve involvement [Table 4] depicting nerve involvement in childhood leprosy cases). Leprosy reactions neither type 1 nor type 2 were observed in our study patients. None of the childhood leprosy patients had any paralytic deformity or physical disability.

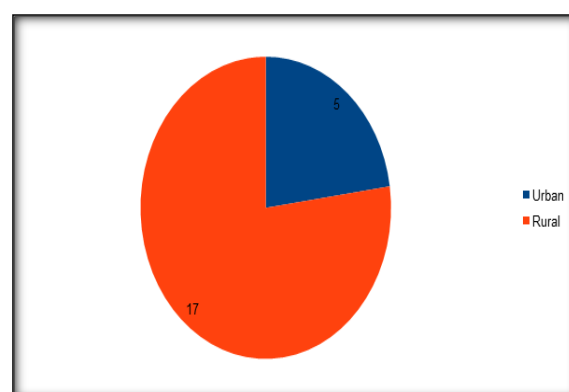
**Table 1: Age distribution of childhood leprosy patients**



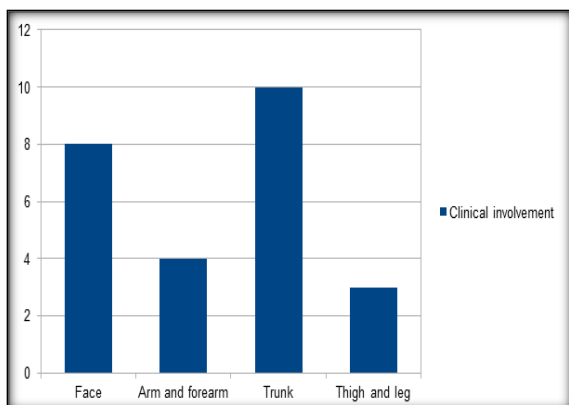
**Figure 1: Sex distribution of childhood leprosy cases**



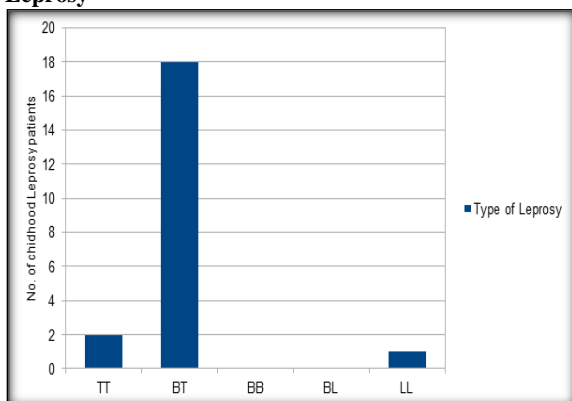
**Figure 2: Area-wise distribution of childhood leprosy cases**



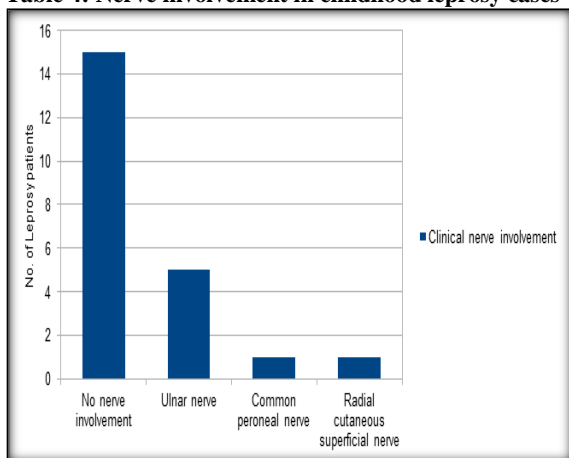
**Table 2: Site of involvement among childhood leprosy cases**



**Table 3: Distribution according to clinical type of Leprosy-**



**Table 4: Nerve involvement in childhood leprosy cases**



## DISCUSSION

In the present study childhood leprosy cases constituted 7.56% of the total leprosy cases registered from 2021-2024. This finding was similar to a study conducted by Rathod et al,<sup>[3]</sup> and Grover et al,<sup>[4]</sup> while Pradhan et al,<sup>[5]</sup> Babu et al,<sup>[6]</sup> reported 13% and 16% of childhood leprosy cases, lower proportion of childhood leprosy cases (4%) was also observed in a similar study by Dogra et al,<sup>[7]</sup> the difference in prevalence in different studies might be due to geographical differences and variable cutoff age used in these studies. Similar to the current study, Joy et al,<sup>[8]</sup> and Sakral et al,<sup>[9]</sup> also reported majority of the cases belonging to higher age group (11-17 years).

## CONCLUSION

The higher prevalence of childhood leprosy in the older age group could be due to failure to report in the early stages of the disease and the long incubation period of leprosy. In our study female patients outnumbered male patients, contrary to the findings from other studies. This could be attributed to the social stigma associated with hypopigmented lesions in patients of skin of colour. Majority of childhood leprosy cases belonged to rural area which was consistent with studies by Gitte et al,<sup>[10]</sup> Chaitra P et al,<sup>[11]</sup> Adil M et al,<sup>[12]</sup> Kulkarni et al,<sup>[13]</sup> and Kadam et al,<sup>[14]</sup> lack of access to healthcare, illiteracy, overcrowding in small houses might have contributed to the higher number of cases from rural area. Among 22 patients of childhood leprosy 3 patients had family history of leprosy. Rodrigues et al,<sup>[15]</sup> observed that children with a family history of leprosy had an 8.7-fold higher chance of developing the disease in comparison to those who did not have affected members in the family. This risk of contracting leprosy is not restricted only to the household contacts but also includes neighbourhood and social contacts. Most of the patients in our study presented with skin lesions on trunk (45.4%) followed by face (36.3%). In contrast to the findings observed by Nair et al,<sup>[16]</sup> Gitte et al,<sup>[10]</sup> and Ghunawat et al,<sup>[17]</sup> who observed most lesions on upper extremities and face. In our study, majority of childhood leprosy cases were of borderline tuberculoid type (81.8%), similar results were obtained by Palit and Imamdar,<sup>[18]</sup> Singhal et al,<sup>[19]</sup> Balai et al,<sup>[20]</sup> and Semwal et al,<sup>[21]</sup> The ulnar nerve was the most common thickened nerve (22.7%) followed by radial cutaneous nerve and common peroneal nerve. Masatkar V et al,<sup>[22]</sup> also recorded that the ulnar nerve was the most common nerve affected, followed by the radial cutaneous nerve and common peroneal nerve. While, Chhabra et al,<sup>[23]</sup> observed thickened ulnar nerve in majority of cases followed by common peroneal, posterior tibial and radial cutaneous nerve. Reactions in children are not as commonly observed as in adults, this could be due to the relatively weaker immunity among children. None of the patients in our study had features of type 1 or type 2 reactions, a similar finding was obtained in a study by Shetty et al,<sup>[24]</sup> and Palit A et al.<sup>[25]</sup>

Although leprosy has been eliminated statistically at the global and national levels, the prevalence of leprosy in Chhattisgarh is above the national prevalence rate, the childhood leprosy cases are suggestive of increased transmission. Therefore, awareness regarding leprosy through implementation of NLEP at all levels of healthcare and community is crucial to reduce the burden of childhood leprosy in high endemic states. Active case searching, single dose rifampicin prophylaxis, facilities for investigations and unrestrained provision of therapy are needed, not just at tertiary care centres but also at

the community level. This study highlights the need for targeted leprosy control activities at high endemic states in India.

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