

*Full Length Research Paper*

## Childhood leprosy: A retrospective study

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Leprosy remains an important public health and social issue in South Asia, particularly in India. Its presence in childhood is an immense social burden on account of the associated disabilities and widely prevalent misconceptions regarding communicability and treatment potential. Besides, the prevalence of leprosy among children suggests possible lacunae in the operation of the national programmes aimed at elimination of leprosy from the society. This paper reports a ten year retrospective study of childhood leprosy in a tertiary care hospital setting (2000 to 2009). Selected socio epidemiologic correlates of pediatric leprosy patients presenting to the hospital over the past ten year period were also studied. The results indicated that childhood leprosy was 5.1% of total leprosy patients registered in the given time frame. Majorities (76.3%) of them were males and had paucibacillary leprosy (74%). Bacillus Calmette-Guerin (BCG) scar was absent in 53% of children. More than a third (35%) cases had a household contact with leprosy. Childhood leprosy remains an important public health problem and bears a significant social impact. Early detection and appropriate prophylactic measures in susceptible children is pivotal to the real success of the National leprosy elimination programme.

**Key words:** Leprosy, childhood, society.

### INTRODUCTION

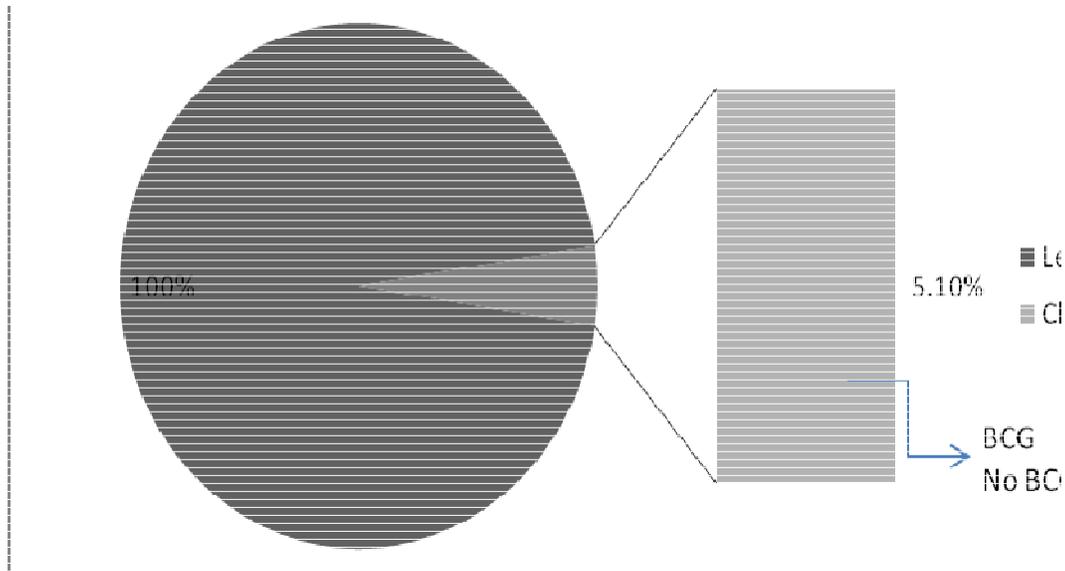
Leprosy is one of the oldest diseases known to mankind. India still remains as the largest home for leprosy in terms of absolute number of cases, prevalence and incidence (Katoch, 2002). A staggering 70% of the world's leprosy burden is shouldered by India (WHO, 2002). Ironically, one-fourth of those affected are below 15 years of age, a stratum that accounts for 40% of the total population (Dayal, 1995). Considering the overwhelming social stigma, potential for deformity and poor quality of life issues inherent to the disease, its occurrence and determinants in the formative years of life can not simply be condoned. Children presenting late, with stigmatizing deformity, indicates inadequate early case detection activities as well as reluctance on the part

of their parents to come forward to access the health system. Not surprisingly therefore, the magnitude of childhood leprosy is regarded as one of the most sensitive performance indicators of the National leprosy elimination programme (NLEP) (WHO, 2005). The present study aims to analyze a ten year record of childhood leprosy cases and discuss selected epidemiological aspects.

### METHODS

All child cases (upto 15 years of age) of leprosy who presented to the outdoor and inpatient services of the Department of Dermatology from the years 2000 to 2009 were retrospectively studied. The cases were identified by clinical and microbiological parameters. The study design was approved by the institutional ethics committee. Clinical criteria for inclusion as cases included hypopigmented skin patch with/without peripheral nerve thickening. Altered/impaired sensation was checked for in older children (>10

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**Figure 1.** Pie chart showing relative distribution of childhood leprosy cases. BCG scar was present in 47% of these children.

**Table 1.** Distribution of study population with respect to gender and type of disease. Figures in parentheses indicate percentages with respect to gender, MB: Multibacillary leprosy, PB: Paucibacillary leprosy.

Age group(years)	Gender			
	Males n= 167 (76.3)		Females n= 52 (23.7)	
	PB n(58.1)	MB n(41.9)	PB n(65.4)	MB n(34.6)
0-5	14(8.4)	10(5.9)	4(7.7)	2(3.8)
6- 10	39(23.4)	28(16.7)	13(25.0)	4(7.7)
11-15	45(26.9)	31(18.6)	17(32.7)	12(23.1)

Chi square= 1.7, df =2, p=0.44.

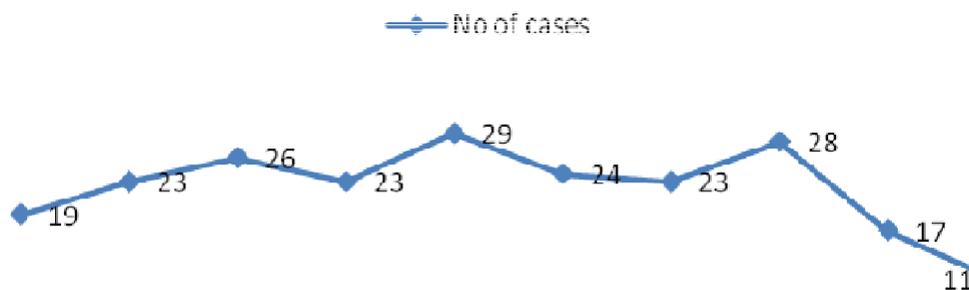
years). Skin smears for acid fast bacilli were done in all cases. A confirmatory skin biopsy was performed in doubtful cases (and with high index of clinical suspicion). Each confirmed case was identified as multibacillary or paucibacillary as per the WHO guidelines (Singh, 2004). The presence of Bacillus Calmette-Guerin (BCG) scar was deemed as an indication of prior BCG vaccination. Personal and family data were retrieved from the records. The socio economic class of the family was ascertained by the Modified Prasad's classification (Kumar, 1993). Analysis was performed using SPSS version 10.0 (SPSS, Chicago, IL.). Chi square test was used for univariate analysis. All 'p' values were two tailed and values of < 0.05 were considered to indicate statistical significance.

## RESULTS

Mean age of the patients was  $10.5 \pm 4.2$  years. Figure 1 illustrates that 5.1% of the total cases of leprosy enrolled in the decade were children below fifteen years (219/4310). Males (76.3%) were more affected in comparison to females (23.7%), but the difference was not statistically significant in different age categories ( $p >$

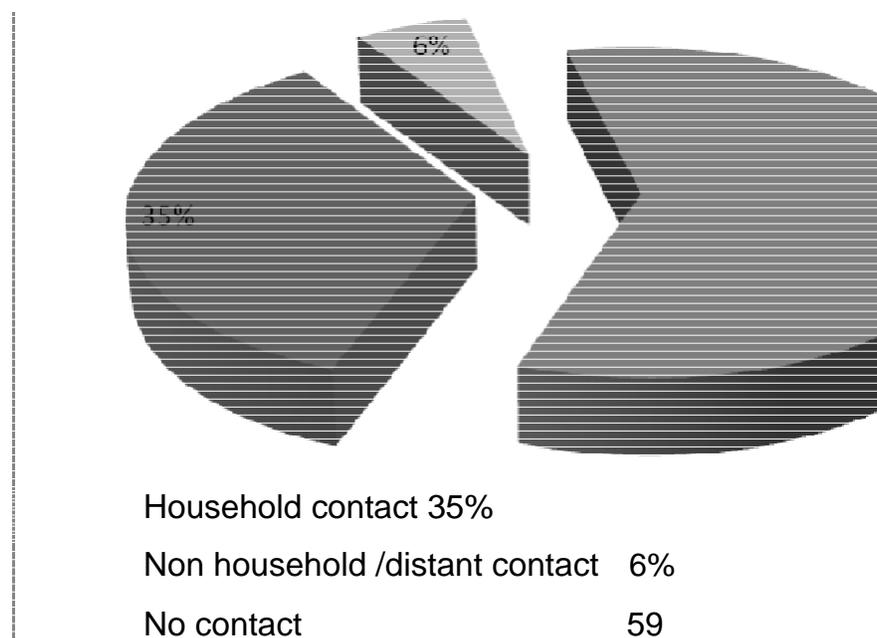
0.05). The age most commonly affected was between 11-15 years in both the sexes [45.5% (26.9% PB, 18.6% MB) males]; [55.7% (32.7% PB, 23.1% MB) females]. The prevalence rates in 0 - 5 years age group among males and females were [8.4% (PB), 5.9% (MB)] and [7.7% (PB), 3.8% (MB)] respectively (Table 1). The youngest child was 3 years old male (with domiciliary contact) and the oldest aged 15 years. Paucibacillary cases constituted the majority in all age groups among both males (58.1%) and females (65.4%). Of the total infected children, 53% had not received BCG vaccination (Figure 1). The year wise break up of the total number of detected cases is depicted in Figure 2. In the former half of the study period, no significant difference was observed in the number of new cases. A downward trend was however, noted in the latter half. A majority of the afflicted children (79%) belonged to the lower social classes. As many as one third (35%) of the children had one or more household contacts with leprosy. The contacts were invariably multibacillary. Of all the

## No of cases



Years 2000 to 2009

**Figure 2.** Line diagram depicting the trend in the number of new cases detected in the study period.



**Figure 3.** Pie chart depicting contact status of leprosy cases.

contacts, 17% were either on interrupted treatment or none at all. In 6% of cases, the contact was not in the household but a relative or neighbor. In a large majority (59%), no contact could be traced (Figure 3). Interestingly, we found only three children with Type I lepra reaction in the entire duration of study (not depicted). All the three had developed the reaction within six months of starting MDT. No case of erythema nodosum leprosum was witnessed.

## DISCUSSION

The observed prevalence (5.1%) of childhood leprosy was less than that reported by Jain et al. (9.8%),(2002) in an urban leprosy clinic in Hyderabad but far more than the current national (1.2%) and state (1.6%) figures (NLEP, 2008; Status Under National leprosy elimination programme in U.P.,2008).The marked male preponderance among the affected subjects is consistent with



**Figure 4.** Hypopigmented patch with elevated borders in a 4 year old child with multibacillary leprosy.

the observation made in several studies that male cases outnumber females to the order of 2:1. It has been proposed that the female child is brought late for diagnosis and treatment and is a victim of prejudice. More so, they have higher rates of deformity; on an average, the period before diagnosis in females is almost twice as long as that in men (Peters, 2002). The incidence rates increase with age (Table 1) as was seen in a South Indian study (Selvasekar, 1999). The incubation period in leprosy has long been a matter of debate and is believed to be highly variable. The occurrence of the disease among few toddlers in our study supports the view that the incubation period may not necessarily be long. Moorthy et al. (2006) have reported leprosy in an 8 month old infant in support of the notion. This makes a strong case for certain unraveled mysteries regarding the natural history of disease including genetic susceptibility and potential for congenital infection. The national trend in prevalence however, is that of a decline as was also observed in the latter years of the study. This highlights the favourable impact of the implementation of the Modified leprosy elimination programmes from 2000 to 2004 (Chudasama, 2007). Moorthy et al. (2006) have reported leprosy in an 8 month old infant in support of the notion. Notwithstanding the insignificant statistical difference between the rates of leprosy observed between BCG and non BCG vaccinated children, the results however, indicated that BCG does offer some protection against leprosy. Independent variables like age, sex and contact status of the individual could have confounded the statistical interpretation. The results corroborate with the conclusions from a controlled study spanning fourteen years wherein protection was demonstrated among BCG vaccinees throughout the study period (Kyaw, 1985). The presence of a household contact in more than third children is of important epidemiological significance

pertinent to that of the 'index case' as these cases are largely multibacillary, and potentially infective. In the Hyderabad study mentioned above (Jain, 2002), a history of contact was present in 38.8% cases. Although, a pivotal role of close contact has been documented by several researchers (Fine, 1997; Van, 1999), few similar studies have shown that clinical leprosy develops in susceptible persons after contact with a patient. They opine that susceptibility is inherited and may be transmitted through successive generations without the appearance of clinical leprosy (Peters, 1955). However, in these studies, the hereditary relationships between the index cases and their contacts were not clear. It is speculated that the closer the contact of these persons, the more they are related to each other genetically, as is the case in Shumin et al. (2001). Their findings are believed to have an important bearing with future control of the disease, and therefore it is recommended that household contacts of the patient should be examined for evidence of leprosy. Studies have clearly established the chemoprophylactic value of dapson for the 'at risk' contacts, particularly for those in the 'high risk' category (Dayal, 1995). Further research is needed to delineate the predictors of susceptibility. Researchers have also proposed chemoprophylaxis using a single dose of rifampicin to prevent leprosy in close contacts. The dosage schedules suggested are 600 mg for adults weighing 35 kg and over, 450 mg for adults weighing less than 35 kg and for children older than 9 years, and 300 mg for children aged 5 to 9 years (Van, 1999). The present work falls short of being only hospital based, yet it is an indicator of subclinical cases prevalent in the community that can be identified using FLA-ABS and lepromin tests in planned population studies. Histopathological morphology for individual lesions could not be studied for all patients due to logistic constraints.

## Conclusion

Presence of leprosy among children is a performance indicator of the NLEP and has immense moral and economic bearing upon the society in general. A high pediatric prevalence of leprosy in Uttar Pradesh province of India prompts one to ponder that the claimed elimination has rather been 'virtual'. We therefore take this opportunity to emphasize upon the need to sustain leprosy services and case finding activities in the better performing states as well, in their post elimination phase. White patches are a frequent occurrence among children (Figure 4), and a thorough evaluation for leprosy is needed, especially in candidate contacts of adult patients. Chemoprophylaxis should be promptly instituted in such children. The importance of routine immunization cannot be overemphasized. A component focused on the education and vocational rehabilitation of affected children should be added to the NLEP in order to mitigate the social impact.

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