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Original Article

Childhood Leprosy in the Light of Global Leprosy Strategy 2016-2020

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Achieving zero grade 2 disability among children diagnosed with leprosy was one of key targets identified in Global Leprosy Strategy (2016–2020). Considering this we decided to study the clinico-epidemiological features of childhood leprosy in the post elimination era, with special reference to disabilities, over a period of 10 years (2006 to 2015). These childhood cases were among the patients attending the leprosy clinic of Govt. Medical College Thrissur, a tertiary care hospital in South India. Data from the case records of all patients with leprosy aged ≤ 15 years registered in our leprosy clinic were compiled and analysed. Out of 409 leprosy patients registered, 24 (5.9%) were children ≤ 15 years. In the first half of the study period (2006-2010) there were 13 childhood cases (6.2%) and in the second half (2011-2015) there were 11 (5.5%). Males (10) out numbered females (3) in the first half of study period where as in the second half, the sex ratio was almost equal (M=5, F=6). The commonest age group affected was 6 - 10 years during both halves of the study period. In both halves of the study period, majority had skin lesions of less than one year duration at the time of presentation. The commonest type of leprosy was borderline tuberculoid (n=19; 79%). All patients were smear negative for acid fast bacilli. Four patients (16.7%) had peripheral nerve thickening but none had visible deformity. Percentage of childhood leprosy (5.9%) in our study is lower than the national (8.94%) and state (6.97%) NLEP figures for the year 2015-2016. Absence of Grade 2 disability is a unique feature of our study. Zero Grade 2 deformity observed in our study is consistent with the Kerala and Tamil Nadu state NLEP data for the year 2016-2017. Zero Grade 2 disability in all our patients possibly points to the early treatment seeking behaviour of population in Kerala leading to early diagnosis and prompt management of lepra reactions.

Keywords : Childhood leprosy, Global leprosy strategy, Grade 2 deformity, Kerala, India

Introduction

Leprosy is no longer considered as a major public health problem as the target of elimination (reduction of disease prevalence to less than one per 10,000 population) was achieved in 2000 at global level and subsequently at national level by December 2005. Though 'eliminated as a public health problem', 2,10,758 new cases of leprosy were detected during 2015 globally, with India leading the list of countries reporting high figures

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of leprosy accounting for 1,27,326 new cases (WHO 2016). Detection of leprosy in children indicates the continued transmission of infection in the community. The proportion of new child cases globally is 8.9% (WHO 2016). The child case rate, an important performance indicator of NLEP, is 0.88/100,000 (Gitte et al 2016). Even in the post-elimination era, there are studies documenting a significant number of childhood cases including smear positive cases, pointing to active disease transmission (Singhal et al 2011, Rao 2009, Ghunawat et al 2018, NLEP 2016-2017). However, the incidence of disability in childhood cases is much low compared to adults (NLEP 2016-2017).

The 5-year global leprosy strategies have focused on the reduction of disease burden measured in terms of new cases with visible deformities or grade-2 disabilities (G2D).

According to the Global Leprosy Strategy 2016–2020: "Accelerating towards a leprosy-free world" released in April 2016, one of the key targets is to achieve zero grade 2 disability (G2D) among children diagnosed with leprosy (WHO 2016). Ours is a tertiary care referral centre offering treatment to patients from three central districts of Kerala, mainly Thrissur, Palghat and Malappuram, with a total population of more than one crore. We decided to study the clinico-epidemiological features of childhood leprosy attending the leprosy clinic of our hospital, with special reference to their disabilities. Although not a true representation of the actual population, 30 - 40% of all leprosy cases in our region are being referred to and treated at our referral centre.

Materials and Methods

This is a retrospective descriptive study. The study duration was 10 years from January 2006 to December 2015. The study population included all cases of leprosy aged $\leq$ 15 years who attended the leprosy clinic of Department of Dermatology & Venereology, Govt Medical College Thrissur, Kerala, India during this period. The study was approved by the Institutional Review Board. The leprosy clinic maintains the clinical and treatment records of all patients. Diagnosis of leprosy was based on the cardinal signs of leprosy and was supported by microbiological and or histological evidence (WHO 1988). Demographic data like age, sex, place of residence, duration of symptoms, history of contact with persons with leprosy and clinical data regarding details of cutaneous lesions, peripheral nerve involvement, sensory and motor deficits were compiled. Data on development of reactions and deformities due to nerve palsy, eye involvement and plantar ulcers were also assessed. Grade 2 disability was defined as the presence of visible deformity or damage (ulceration, shortening, disorganization, stiffness and loss of part of or all of hand or foot) affecting hands and feet due to leprosy or visual acuity less than 6/60 or inability to count fingers at a distance of six metres caused by leprosy (Brandsma & Brakel 2003). Data of slit skin smears (one from right ear lobe and one from skin lesion) and histopathology from the lesional skin were analyzed in all cases. Patients were categorized based on Ridley-Jopling classification and NLEP criteria. As per NLEP (in collaboration with Global Alliance for leprosy elimination and WHO), the disease is classified as multibacillary (MB) if there are six or more lesions and/or more than one nerve involvement and/or a positive skin smear from any site. Treatment details, any treatment related complications, lepra reactions, compliance, and relapses were also analyzed. Data were compiled and analyzed using MS excel 2007 and epi info software.

Results

A total of 409 leprosy patients were registered in our leprosy clinic during the study period. Among

Table 1 : Number and percentage of childhood leprosy cases studied

Year	Number of childhood cases	Total cases
2006-2010	13(6.2%)	210
2011-2015	11(5.5%)	199
Total	24(5.9%)	409

Table 2 : Age and sex distribution of childhood leprosy cases

Age group of patients (years)	No. of childhood cases between 2006-2010		No. of childhood cases between 2011-2015	
	No. of males n= 10	No. of females n=3	No. of males n= 5	No. of females n=6
0-5	0	0	1	0
6-10	7	1	2	5
11-15	3	2	2	1

Table 3 : Duration of symptoms at the time of presentation in childhood leprosy cases

Duration of symptoms	Period (2006-2010) Number of patients n=13	Period(2011-2015) Number of patients n=11
< 1 year	10	6
1-2 years	2	2
> 2 years	1	3

them, 24 (5.9%) were children $\leq$ 15 years. In Table 1, the total number of leprosy cases and childhood cases during first half and second half of the study period is given. Age and sex distribution of the childhood cases of leprosy is given in Table 2. In the first half of the study period (2006-2010) there were 13 childhood cases (6.2%) and in the second half (2011-2015) there were 11 (5.5%). Males (10) outnumbered females (3) in the first half of study period where as in the second half the sex ratio was almost equal (M=5, F=6). The commonest age group affected was 6-10 years during both halves of the study period. The youngest was a girl aged 3.5 years. Majority (66.7%) had duration of skin lesions of less than one year and 33.3% patients had lesions of more than 1 year at the time of presentation. Table 3 shows the duration of skin lesions at the time of presentation in the two halves of the study period.

The details regarding clinical spectrum, nerve involvement, family history and lepra reaction are given in Table 4. Borderline tuberculoid (BT) was the commonest spectrum (79%). 70.8% belonged to paucibacillary group as per NLEP criteria. Four patients (16.7%) had peripheral nerve involvement in the form of nerve thickening. Left ulnar nerve was involved in two of them. Right common peroneal nerve and both posterior tibial nerves were involved in one patient each. No patient had nerve function impairment or deformities. History of leprosy in the family was obtained from six patients (25%). The commonest index case was a parent. Two (8.3%) patients developed type

Table 4 : Clinical spectra, peripheral nerve involvement, presence of family history and lepra reaction in childhood leprosy cases

	TT n=1	BT n=19	BB	BL	LL	HD I n=4	Total (n=24)	%
PB	1	12	0	0	0	4	17	70.8
MB	0	7	0	0	0	0	7	29.2
Peripheral nerve involvement	0	4	0	0	0	0	4	16.7
Presence of family history of leprosy	1	5	0	0	0	0	6	25
Presence of lepra reaction	0	2	0	0	0	0	2	8.3

1 lepra reaction with neuritis. Both of them belonged to BT spectrum. They were managed with tapering doses of oral Prednisolone as per WHO recommendations. Fortunately they did not develop any deformities. Four (16.7%) patients developed Dapsone induced hemolytic anemia. In two of these patients on paucibacillary (PB) treatment, Dapsone was stopped and replaced with Clofazimine. In two others on multibacllary multidrug therapy (MB MDT), treatment was continued for one year without Dapsone. One (4.2%) patient developed asteatotic eczema secondary to Clofazimine induced ichthyosis. No other significant side effects were noted. All patients completed treatment within the prescribed time period. There were no cases of relapse.

Discussion

The prevalence of childhood leprosy is an evidence of active disease transmission in the community. The percentage of childhood leprosy during the study period (2006-2015) was 5.9%. It was less than several other studies conducted in different parts of India including from our neighbouring district Kozhikode (Gitte et al 2016, Ghunawat et al 2018, Sasidharanpillai et al 2014). In the first half of the study period (immediate post elimination period 2006-2010) the percentage of childhood leprosy detected was 6.2% versus 5.5% in the next five year period (2011-2015). A slight decline in the proportion of childhood cases was observed in the latter half of the study period. As per the data from NLEP, the proportion of childhood cases from Kerala has declined from 10.16% (NLEP 2008-2009) to 6.97% (NLEP 2015-2016). The male preponderance noted in the first half of our study period was similar to previous studies (Sasidharanpillai et al 2014, Jain et al 2002). In several other studies from India, the male: female ratio ranged from 1.25:1 to 3:1 (Palit & Inamadar 2014). The slight female preponderance observed in the latter half of the study period was similar to another recent study from South Kerala (Philip et al 2018). The most common age group affected in our study in both halves of the study period was 6-10 years. This is consistent with several other studies (Sasidharanpillai et al 2014, Jain et al 2002). The long incubation period of leprosy may be the reason why leprosy is less prevalent among children below 5 years of age.

Contact history was obtained in 25% in our study. All of these were household contacts. Contact history in other studies ranged from 6.06% to 47% (Prasad 1998, Nair 2017). Since “open” cases contribute much to spread of leprosy among

children, thorough examination of contacts of leprosy cases is mandatory. Chemoprophylaxis and/ or immunoprophylaxis provided to contacts of leprosy cases might further help to bring down the prevalence of disease in children.

BT was the commonest spectrum in all studies including ours (Sasidharanpillai et al 2014, Jain et al 2002, Singhal et al 2011) PB cases outnumbered MB cases in our study. This is similar to other studies from India (Palit & Inamdar 2014). But MB cases were more in number in the study by Singal et al (2011). Peripheral nerve involvement was seen in only four (16.7%) of 24 cases in our study. This was strikingly low when compared to other studies (Sasidharanpillai et al 2014, Singhal et al 2011). The number of children who developed Type 1 lepra reaction was also less (8.3%) when compared to other studies (Palit & Inamdar 2014). These could be the major reasons for zero grade 2 disability noted in our study. Absence of grade 2 disability is a unique feature of our study. Most of the previous studies had higher percentage of grade 2 disabilities. A recent 11 year study of childhood leprosy from Delhi has reported Grade 2 disability of 18.6% (Ghunawat et al 2018). In the study by Palit & Inamdar on childhood leprosy in past two decades, rate of deformity varied from 0 - 24% (Palit & Inamdar 2014). An interesting feature observed in the study by Shetty et al was absence of disability in children from urban area when compared to rural area (Shetty et al 2013). There has been a decline in the rate of childhood disability as per the NLEP state wise data including from Kerala state. The NLEP 16-17 state wise data from Kerala and Tamil Nadu also shows zero grade 1 and 2 disability in children.

Awareness about the disease, high literacy rate (close to 100%) of our population in Kerala and early treatment seeking behavior might have contributed to the short duration of illness. This could have been one of the reasons for zero grade 2 disability (G2D). Main limitation of our study is its retrospective nature which might affect the quality of data. Ours being a tertiary care referral centre, a high degree of diagnostic accuracy can be ensured. A proper follow up of cases can also be ensured as we have the services of assistant leprosy officer in our centre.

Conclusion

The present study offers an insight into current status of childhood leprosy in a region where leprosy is already declared to be 'eliminated as a public health problem'. A low prevalence of childhood leprosy with a declining trend was observed in this study. The presence of index cases in the family itself in nearly one fourth of our patients, however suggests the need for continuation of community based surveillance and also the possible role for chemoprophylaxis and or immunoprophylaxis to close contacts of especially smear positive cases. Zero grade 2 disability in all our patients possibly points to the early treatment seeking behaviour of our population and early recognition and prompt management of lepra reactions.

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