Childhood leprosy: three years experience from Teaching Hospital, Anuradhapura, Sri Lanka

G I D R R Ranawaka[1], H S Weerakoon[2]

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Abstract

A hospital-based prospective study was carried out at Teaching Hospital, Anuradhapura, during a 3 year period. Out of 221 new leprosy patients 22 (9.95%) were children aged 6-14 years. Male: female ratio was 1.4:1. The commonest type of leprosy was tuberculoid (63%), followed by borderline lepromatous (18%), borderline tuberculoid (13.6%), and one indeterminate leprosy. PB and MB regime was given to 18 and 4 respectively. Single hypopigmented macule was the commonest (63.6%) clinical presentation. The majority had lesions on exposed parts of the body; forearm (6), legs (5), face (3) and arm (2). One child with borderline lepromatous had plantar ulcers and burn injuries on hands. 10 (45.4%) gave a history of contact, all being immediate family members; father (5), mother (3), siblings (5). There were five families where ≥ 3 members affected.

High child rate indicate high disease transmission. We must implement specific preventive and control measures for this age group to reduce transmission of the disease and to prevent permanent disabilities.

Introduction

Sri Lanka achieved the leprosy elimination goal in 1995. The current prevalence is 0.6 per 10,000 populations. A total of 21 of the 26 districts and 7 of 9 provinces have a reported prevalence of <1/ 10,000 populations. The new case detection rate (NCDR); 9.8 per 100,000 populations has remained more or less static during the last five years[1]. In Anuradhapura district elimination is sustained since 2001[1].

The Central Leprosy Campaign (CLC) in Sri Lanka played a monumental role in bringing leprosy under control. With the achievement of elimination level in 1995, the management of leprosy had been integrated into the general health care services since 2001. All new patients in each district are referred to dermatology units in respective districts to initiate treatment.

Leprosy among children reflects the disease transmission in the community and the efficiency of control programs[2]. The prevalence of childhood leprosy in high endemic areas varies from 10% to 40%. In endemic areas, the peak incidence is in the age group of 10-14 years[3,4]. Transmission within household had been identified in many studies[5,6].

This prospective study was undertaken to assess the prevalence, clinical manifestations, treatment response, complications and contact history of children who had leprosy in Anuradhapura district, Sri Lanka.

Material and Methods

Study location

Anuradhapura district is situated in North Central Province, 224 km from Colombo, in the dry zone of Sri Lanka. This is the largest district in the country with a low population density of 112 persons per sq km. The majority was rural population (92.7%) engaged in farming, while 7.1% urban and 0.1% estate according to the Department of Census and Statistics, 2001. Sex ratio (men/women ratio) in Anuradhapura district was 108.4. Total population in 2001 was 745,693; where 44.9% was between 0-14 years of age, 45% was between 15-59 years and 10.1% was 60 years and over (www.statistics.gov.lk/PopHouSat/PDF/Population/p9p8%20Ethnicity.pdf).Teaching Hospital, Anuradhapura is the only tertiary care hospital in Anuradhapura district where there is a consultant dermatologist. All new leprosy patients detected in this district are referred to TH Anuradhapura to initiate anti leprosy treatment.

Patient selection

A hospital-based prospective study was carried out at TH Anuradhapura, during the 3 year period from January 2006 to December 2008. All the children who were registered for anti leprosy treatment were included in the final analysis. Clinical research form was filled

[1]*Consultant Dermatologist*, [2]*Medical Officer, Teaching Hospital, Anuradhapura.*

by the investigators indicating their age, sex, clinical presentation, contact history, response to treatment and complications. Investigators examined the children and categorized the disease into tuberculoid (TT), borderline tuberculoid (BT), mid borderline (BB), borderline lepromatous (BL) and lepromatous leprosy (LL). Patients were treated either with paucibacillary (PB-MDT) or multibacillary multi drug (MB-MDT) therapy. They were followed up during the treatment period and observed for any complications caused by the drugs or disease. Histology was performed on selected patients, either with doubtful lesions, lesions on very young children or lesions on the face where sensory impairment could not be established.

Results

There were total numbers of 74, 78 and 70 new leprosy patients registered in skin clinic TH Anuradhapura during years 2006, 2007 and 2008 respectively. Of these 9, 7 and 6 were children in the age group of 6-14 years indicating a child rate of 12.1%, 9% and 8.5% respectively (Table 1).

Age and sex distribution

There were 13 boys and 9 girls with an M: F ratio of 1.4: 1. Of these 86.3% (19/22) were in 10-14 age group, 13.6% (3/22) were in 6-9 age group. Mean age at onset was 11 years; youngest was 6 years.

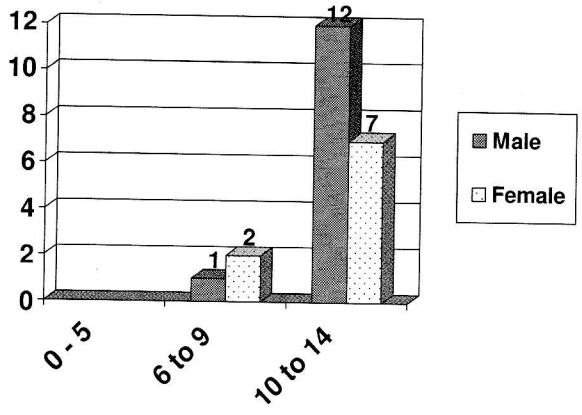

Figure 1. *Age and sex distribution of childhood leprosy in Anuradhapura district, Sri Lanka from 2006 to 2008.*

Clinical manifestations

The commonest type of leprosy was tuberculoid – 63.6% (14/22), followed by borderline lepromatous – 18% (4/22) and borderline tuberculoid – 13.6% (3/22). The youngest child had indeterminate leprosy (IL) where histology was non specific. PB and MB regimes were given to 18 and 4 respectively. The mean duration of patient delay was 9.7 months in PB and 15.8 months in MB. In PB leprosy 13/18 presented within 6 months of appearance of skin lesions, and 5/18 has had the lesions for ≥12 months. In MB leprosy 2/4 presented within 2 months, and 2/4 after 24 months. In total, 68% (15/22) of childhood leprosy presented to TH Anuradhapura within 6 months.

Single hypopigmented macule was the commonest 63.6% (14/22) clinical presentation. Except one child who had the lesions on the back of the trunk all had lesions on exposed parts of the body; forearm (6), legs (5), face (3) and arm (2).

Pathological investigations

Out of 22 children 12 underwent skin biopsy, of which 58.3% (7/12) showed a clinico-histopathological correlation. One child with borderline lepromatous leprosy showed tuberculoid type histology. Four children showed non-specific histology but the clinical diagnosis prevailed.

Complications

Two developed type I reactions; two developed dapsone induced haemolysis and one had dapsone hypersensitivity syndrome. One child with BL had burn injuries on left hand and plantar ulcers on left sole at the time of presentation. In others the disease and the treatment period was uneventful. Two children with type I reaction responded to 12 weeks regime of oral prednisolone uneventfully.

Contact history

Ten (45.4%) children gave a history of contact with leprosy patients, all being immediate family members. 5 children had their fathers with MB disease, 3 children had mothers with MB disease while 1 child's mother was found to have PB disease. Siblings with PB disease were found in 5 children. There were 5 families where 3 or more family members were affected.

Discussion

The prevalence of leprosy in Anuradhapura district from 2006 to 2008 varied from 0.6 to 0.7 per 10,000 populations; NCDR varied from 8.3 to 9.1 per 100,000 populations. This study showed higher incidence of leprosy among men; M: F ratio of 1.62: 1.

Table 1. Leprosy statistics in 2006, 2007 and 2008 in Anuradhapura district, Sri Lanka

Year	*2006*		*2007*		*2008*	
Prevalence of leprosy (per 10,000 inhabitants)	0.6		0.7		0.6	
Total number of new patients	74		77		70	
New case detection rate (per 100,000 inhabitants)	8.8		9.1		8.3	
Type of leprosy	**PB**	**MB**	**PB**	**MB**	**PB**	**MB**
Total number of PB and MB patients	34	40	36	41	35	35
	M F	**M F**	**M F**	**M F**	**M F**	**M F**
Male and Female distribution of total leprosy patients	15 19	29 11	24 12	27 14	21 14	23 12
Male and Female distribution of children	4 3	2 0	4 2	1 0	1 4	1 0
Total number of affected children	9		7		6	
Child rate %	12.1%		9%		8.5%	
Deformity rate in children %	none		none		One child (4.5%)	

PB - Paucibacillary leprosy, MB - Multibacillary leprosy, M - Male, F - Female

Table 2. Clinical types of leprosy in children from 2006 to 2008 in Anuradhapura district, Sri Lanka

Type of leprosy	*Number of patients*	*Percentage (%)*
IL	1	4.5
TT	14	63.6
BT	3	13.6
BB	0	0
BL	4	18.1
LL	0	0
Pure neuritic	0	0

IL - Indeterminate leprosy BT - Borderline tuberculoid leprosy BB - Borderline leprosy
BL - Borderline lepronatous leprosy LL - Lepronatous leprosy

Average child rate in this study was 9.95%. Among children boys showed higher incidence of leprosy with a M: F ratio of 1.4: 1 reflecting the pattern in total leprosy patients. In this study all the children were within the age group of 6-14 years, where maximum incidence was seen in 10-14 age group which agree with previous observations[2,7,8].

Tuberculoid leprosy was the commonest type. Single hypopigmented macule was the commonest clinical presentation which agrees with published data[2]. In children the diagnosis was mainly clinical.

Eight children had acquired the disease from infected mother or father who had BL or LL untreated for more than 12 months. This study showed higher incidence of MB leprosy in total population showing delayed diagnosis of MB leprosy. We noticed that leprosy is misdiagnosed by many health care personnel, being mistaken for other medical problems such as renal failure, cardiac failure, drug allergy, and chronic liver disease, causing delay in diagnosis leading to permanent disabilities in adults. But, since we educated infected adults to screen their children for hypopigmented anaesthetic patches on skin, childhood leprosy was detected early.

Deformities and disabilities were uncommon in children; except for a 13-year-old boy who presented with burn injuries and plantar ulcers due to peripheral numbness which was left untreated for more than 12 months. His father was found to have untreated MB leprosy for more than 2 years. Deformity rate in children in this study was 4.5% (1/22) which was low compared to other countries endemic for leprosy; Nepal - 20% and India - 33%[7,8]. That was probably due to early diagnosis and treatment of childhood leprosy, and easy accessibility of health care services.

Although leprosy had been eliminated as a public health problem from Anuradhapura district, child rate was high. Leprosy has a slow evolution, which mostly affects the adult population. Epidemiologically, childhood leprosy is an index of transmission of disease in population and allows identification of index case. Active identification of index case was not done since it would have aroused undue social embarrassment. We examined the parents and siblings who came to the clinic and advised parents to look for suspicious lesions in close family members and bring them to the clinic if any.

In conclusion, high child rate showed that disease transmission continues in this region. We must implement specific preventive and control measures for this age group to reduce transmission of the disease and to prevent permanent disabilities.

References

1. Quarterly Review of Leprosy Statistics in Sri Lanka 2006/ 2007/ 2008. Sponsored by Lepra.ch.
2. Selvasekar A, Geetha J, Nisha K, Manimozhi N, Jesudassan K, Rao PSS. Childhood leprosy in an endemic area. *Lepr Rev* 1999; **70**: 21-7.
3. Sehgal VN, Joginder. Leprosy in children: correlation of clinical, histopathological, bacteriological and immunological parameters. *Lepr Rev* 1990; **61**: 81.
4. Rao PS, Karat AB, Kaliaperumal VG, Karat S. Transmission of leprosy within households. *Int J Lepr Other Mycobact Dis* 1975; **43**: 45-4.
5. Vara N. Profile of new cases of childhood leprosy in a hospital setting. *Indian J Lepr* 2006; **78**: 231-6.
6. Jesudasan K, Bradley D, Smith PG, et al. Incidence rates of leprosy among household contacts of "primary cases". *Indian J Lepr* 1984; **56**: 600-14.
7. Dayal R, Hashmi NA, Mathur PP, Prasad R. Leprosy in childhood. *Indian Paediatr* 1990; **27**: 170-80.
8. Deb Burman K, Rijal A, Agrawal S, Agrawalla A, Verma KK. Childhood leprosy in Eastern Nepal, a hospital based study. *Indian J Lepr* 2003; **75**: 53-7.