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Original Article

Childhood leprosy: a retrospective descriptive study from Pakistan

Mutaher Zia, Muhammad Irfan Anwar*, Muhammad Iqbal

Marie Adelaide Leprosy Centre, Karachi
*Bahria University Medical and Dental College, Karachi

Abstract

Aim Leprosy remains a public health issue in many developing countries. The prevalence of leprosy in children is a useful indicator of the current status of disease transmission in a country. To date, studies pertaining to the proportion and characteristics of childhood cases in Pakistan are not available.

Objective We aimed to describe the clinico-epidemiologcial pattern of childhood leprosy in Pakistan.

Methods This retrospective descriptive analysis was done, from the medical records of all new childhood leprosy cases, diagnosed at Marie Adelaide Leprosy Centre, Karachi during a two-and-a-half-year period, from January 1, 2016 to June 30, 2018.

Results A total of 11 cases were analyzed. The mean age at diagnosis was 9.3 years, with age range of 4-14. Male-female ratio was 0.8:1. Borderline tuberculoid (BT) was the most common classification (37%) and ulnar nerve was the most commonly found enlarged nerve (46%). 2 cases (18%) presented with a type 1 (reversal) reaction. None of the cases had a visible deformity (grade 2 disability), at the time of diagnosis. Mean delay in diagnosis was 9 months. 91% had a history of a household contact with leprosy. In 70% of these, the index case had lepromatous leprosy (LL).

Conclusion Childhood leprosy is prevalent in Pakistan. Efforts should continue to carry out contact screening of all cases and to keep health care providers and communities informed, about its signs and symptoms. Early detection and treatment are the key to prevention.

Key words
Childhood leprosy, clinico-epidemiological features, retrospective study.

Introduction

Leprosy is a chronic infectious disease, caused by *Mycobacterium leprae (M. leprae*). It mainly affects the skin and peripheral nerves and if not detected early, can lead to deformity and disability. It can occur at any age but is rare in infants.[1] In the year 2016, out of a world total of 214783 new leprosy cases, 18230 (9%) were children (0-14 years).[2] A similar proportion was seen in Pakistan, where out of a total 397 new cases, 38 (10%) were children.[2] The highest number was detected in Sindh province; a total of 29 (76%).[3] 5 (13%) cases were detected in Baluchistan and 4 (11%) in Punjab. No child cases were reported in Khyber Pakhtunkhwa, Gilgit-Baltistan or Azad Kashmir.[3]

The purpose of this study is to highlight the salient characteristics of leprosy in children, in our region. We conducted our study at Marie Adelaide Leprosy Centre (MALC), Karachi which is one of the two major referral hospitals

Address for correspondence
Dr. Muhammad Irfan Anwar
Assistant Professor of Dermatology
Bahria University Medical & Dental College
Karachi, Pakistan
Email: doctorirfananwar@gmail.com

for leprosy in Pakistan.

Methods

We selected all new cases of leprosy aged 0-14 years, who had been diagnosed at MALC during a two-and-a-half-year period, from January 1, 2016 to June 30, 2018. A total of 13 child cases were identified. We excluded 2 cases who had not been reviewed by a senior doctor and included the remaining 11, in our study. Information on the demographic and clinical features of each case was then collected, from the medical records available at the center.

Results

Age and gender Out of the total 11 cases registered in our study, two were in the 0-5 age-group. Four cases were in 6-10 age-group and five were in 11-14 age-group. The youngest was a 4-year-old female and the eldest was a 14-year-old male. Three cases were 12-year-old, making this the most common age at diagnosis, within the group. The mean age was 9.3 years. 5 (46%) cases were males and 6 (54%) were females. The male to female ratio was 0.8:1.

Residence and ethnic group 10 cases were from Sindh province and one female was from Naseerabad district, in Baluchistan. Among those from Sindh, 5 had their residence in Karachi. One patient came from Hyderabad, two siblings were from Thatta. One girl was from Mirpurkhas and another from Matiari.

Sindhi was the most common language, spoken by 4. Balochi was the mother-tongue of 3. One male child was from a Pathan family, living in Karachi. A female resident of Karachi belonged to a family of Bengali immigrants and another female had Kathiawarri, as her mother-tongue. A male child, also living in Karachi came from the Persian speaking, Hazara community of Afghanistan.

Table 1 Age and gender distribution (n=11)

Age (years)	*Male*	*Female*	*Total*
0-5	1	1	2 (18%)
6-10	2	2	4 (36%)
11-14	2	3	5 (46%)

Household contact and socio-economic status History of a household contact was present in 10 (91%), out of 11 cases. In 6 (60%) cases, the index case was a parent. In 4 out of these it was the father and in 2, it was the mother. Two females had their elder brothers, diagnosed earlier as cases of multibacillary leprosy. Two siblings had an older, female cousin living in the same house and earlier diagnosed as lepromatous leprosy (LL). In 7 (70%) cases, the index case had LL leprosy. In two cases, the fathers were classified as borderline lepromatous (BL).

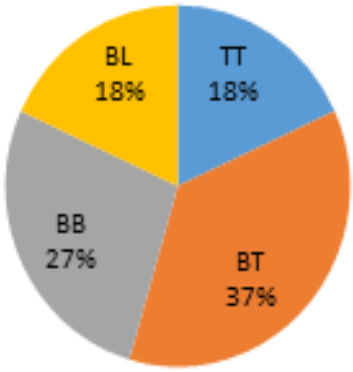
In 9 out of 11 cases, the fathers were poor laborers. The father of one girl was a rickshaw driver.

Classification and clinical features Two male cases were classified as tuberculoid (TT). Both had few, hypopigmented patches with hair-loss. In one case, the margin was erythematous and slightly raised and there was loss of sensation in the lesion. Four cases were classified as borderline tuberculoid (BT). These had asymmetrical, hypopigmented macules and patches on face, limbs and trunk. In two of these cases, loss of sensation was detected in lesions. One of these also had loss of hair in the lesions.

Three were classified as mid-borderline (BB). Two were siblings, a brother and sister. Punched-out plaques were found in all three cases. In one of these, the common peroneal nerves were found to be enlarged and in the other two, the ulnar nerves were enlarged. Skin smears were not taken in the former. Smears

were negative in the latter two cases. Both of them presented with a type 1 (reversal) reaction at the time of diagnosis, with inflamed lesions.

Two cases were classified as borderline lepromatous (BL). One was a female with symmetrical, hypopigmented and erythematous, anesthetic patches and an enlarged ulnar nerve. She also presented with a type 1 reaction, 2 months after starting anti-leprosy treatment. The other case was a male with hypopigmented, anesthetic patches and bilateral, symmetrical enlargement of great auricular, ulnar, radial cutaneous and common peroneal nerves. His skin smear was also positive for AFB. None of the cases was classified as lepromatous (LL).



Distribution of cases by classification of leprosy (n=11)

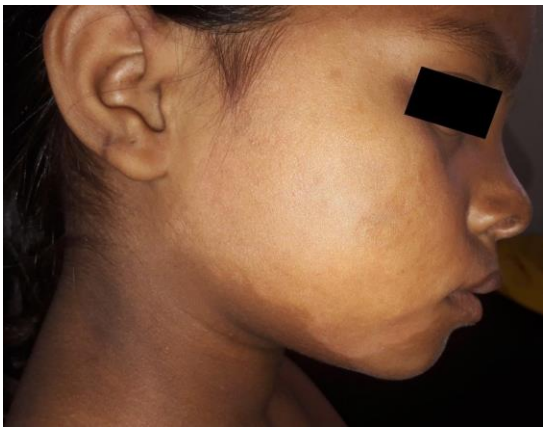


Figure 1 A hypopigmented, anesthetic patch on the face of a 9-year-old girl

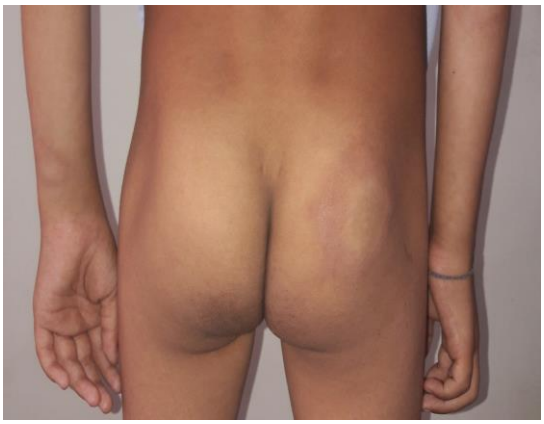


Figure 2 Annular lesions with central clearing, on the left forearm and right buttock of a 7-year-old male

Nerve involvement Ulnar nerves were the most commonly enlarged nerves, found in 5 (46%) cases. In three of these they were bilaterally enlarged. Common peroneal nerve was enlarged in four and radial cutaneous in three cases. Great auricular and posterior tibial nerves were enlarged, in one case each. Anesthesia was detected in the hands and feet of the eldest case, the 14-year-old male with BB. Fortunately none of the cases had any muscle weakness, at the time of diagnosis.

Reactions Type 1 (reversal) reaction was seen in two cases (18%), at the time of diagnosis. Both were siblings and were classified as BB leprosy. Another 9-year-old female presented with a type 1 reaction, two months after starting treatment with anti-leprosy, multidrug therapy (MDT). None of the cases presented with a type 2, Erythema nodosum leprosum (ENL) reaction.

Delay in diagnosis The shortest time period, from the signs and symptoms being noticed and the diagnosis was, one month. The longest was 3 years, as in the case of the 9-year-old Bengali girl whose two elder brothers were diagnosed, at the same time. Mean duration was 9 months.

Discussion

According to the WHO leprosy update-2016, the incidence and prevalence of leprosy in Pakistan was 0.2 per 100,000 populations and 0.03 per 10,000 population respectively.[2] Our study included 11 childhood cases of leprosy. The mean age was 9.3 years with age range of 4-14 years. The highest proportion of cases was in the 11-14 age-group (46%). In a recent study in India, the youngest age reported was also 4 years and 78% of the cases were between 10-14 years.[4] In another study by the authors the youngest age was 7.[5] In a study from northern Pakistan, the youngest case was 9-year-old.[6] This could be due to the fact that *M leprae* is a slow growing organism and the incubation period of leprosy is long, 2-12 years.[7] The male to female ratio was 0.8:1, with 5 male cases and 6 females. The overall male-female ratio for all new cases detected in the country in 2016 was 1.2:1.[3] In the absence of any other study done on childhood leprosy in Pakistan, we cannot make a comparison. In an analysis of 12 Indian studies on childhood leprosy, there was a male preponderance in all except 1.[8]

Borderline tuberculoid was the most common type of the disease seen (37%) and ulnar nerve was the most commonly found enlarged nerve (46%). These findings were similar to those in Indian studies.[4,8] 2 (18%) cases presented with a type 1 reaction, at the time of diagnosis. Type 2 reaction was not seen in any.

Mean duration from the signs and symptoms being noticed and the diagnosis was 9 months. The range was 1 month to 3 years. In a study done in Nigeria, the diagnostic delay ranged from 5 months to 4 years.[9] Leprosy is a disease with a slow and silent onset. The aim is to diagnose cases before nerve damage leads to deformity and disability. In our study none of the cases presented with a visible deformity; grade 2 disability (G2D). In a study done in West Bengal, India 6.6% children had a G2D, at the time of diagnosis.[10] Global leprosy strategy launched by WHO in 2016, aims at reducing new child cases with a grade 2 disability to zero, by the year 2020.[2]

In 91% cases there was a history of household contact. In 60% of these, it was a parent and in 70%, the index case had lepromatous leprosy. In their study on household and dwelling contacts in Malawi, Fine et al.[11] concluded that multibacillary cases are the most important human source of transmission. This is most likely among closest contacts but can occur with casual contact. Risk is highest among young contacts and higher among males. This indicates that infection of males at an early age is an important factor, for the persistence of leprosy in communities.[11]Almost all cases in our study belonged to poor families. Pönnighaus et al.[12] suggested that extended schooling and good housing reduced the risk of leprosy.

Our study shows that childhood leprosy is prevalent in Pakistan and the multibacillary type (MB) with a proportion of 82%, is more common than paucibacillary (PB), in this age-group. The findings are similar to those of another study done by the authors and which comprised of mainly adult cases.[5] The overall proportion of MB cases in Pakistan, in 2016 was 72%.[2] The proportion of MB cases indicates the presence of advanced cases and thereby, the magnitude of infection.[13] The proportion of pediatric cases indicates continued transmission and is a sensitive indicator, to measure transmission trends.[14] This points to the need for creating awareness and for case detection campaigns to detect all child cases, before they develop disabilities.[13]

One shortcoming of our study was the non-availability of any data, on BCG vaccination of

these children. Studies have shown protection against leprosy and that this protection can last for decades. Maintaining high levels of BCG immunization in newborns is considered important for prevention of leprosy.[15]

We conclude our study by stating that childhood leprosy is still prevalent in Pakistan. All out efforts should continue to carry out, contact screening of known leprosy cases, especially multibacillary cases and to keep health care providers and communities informed, about its signs and symptoms. Early detection and treatment of all cases, remain the key to prevent transmission of leprosy.[2]

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