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Original Article

Leprosy in Females: A Retrospective Study in the Urban Leprosy Center of a Tertiary Care Center from Kerala, South India

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Leprosy in females has got special epidemiological significance as they are more likely to transmit the infection to their children with whom they are often in close contact. The primary aim of the present study was to determine the proportion of leprosy in females and the secondary aim was to study the clinical profile of these cases. This is a 19 year (1997-2015) retrospective descriptive study done in a Tertiary Care Centre at Thiruvanthapuram, Kerala. Females constituted 258 new leprosy cases (n=258) in this study, thus accounting for a proportion of 27.83%. The female/male ratio was 1: 3.59. The age group 41-50 constituted the maximum number of cases, 50 (19.38%). The mean age was 37.60 years. Indeterminate leprosy (I) was the commonest type of leprosy seen in this study accounting for 47 cases (18.22%) followed by patients in borderline spectrum (BT followed by BB and BL), then Lepromatous (LL). Smear positive cases accounted for 38 cases (14.73%). There were 19 cases of leprosy (7.36%) in the childhood age (1-12 years), with BT being the commonest type, 8/15 (53.33%) followed by Indeterminate (I) and TT. Lepra reactions were present in 45 cases (17.44%). Grade 2 disability was present in 33 cases (12.79%). Patients who were defaulters and on irregular treatment accounted for 2 cases (0.78%). The proportion of leprosy in females in this study was similar to other studies. Indeterminate leprosy was the commonest type, not seen in other studies. The proportion of irregular treatment/defaulters was very low and there were no serious adverse drug reactions to anti-Hansen therapy in this study. As this study was done in a Tertiary Care Centre over a long period of two decades, the figures may not be a true indicater of today's status and general trend in the community which should be analysed by well designed population based epidemiological studies. Data from this study will be useful in planning such studies and necessary interventions.

Key Words : Leprosy in females, Indeterminate, Kerala

Introduction

Leprosy affects world wide the male gender more than females. This is because males might be more genetically susceptible to leprosy and they have greater risk to acquire leprosy because of their outdoor activity related to occupation, since leprosy is predominantly transmitted by the respiratory route (Ali & Prasad 1966). The more health care seeking attitudes in males than females could be another reason. Most epidemiological studies in leprosy have shown a male predominance (Jesudasan et al 1984, George et al

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1993). Leprosy in females especially mothers, have epidemiological significance as they are in close contact with their children and may facilitate transmission to their offsprings. Moreover an interesting recent study from India demonstrated that female health workers were more successful in detecting leprosy in females than their male counterparts (Verma & Rao 2014). Studies concentrating on leprosy in females are few both in India and abroad. Hence we decided to conduct this study. The primary objective of this study was to determine the proportion of leprosy in females and the secondary objective to study the clinical features of leprosy in these females.

Materials and Methods

Study setting

This is a 19 year (1997-2015) retrospective descriptive study done in the urban leprosy center of a tertiary care institute.

Study population

The study population included all new female leprosy cases who attended the aforementioned center in the study period.

Data collection

The data were collected from the pre-formatted National Leprosy Eradication programme (NLEP) designed leprosy cards. The salient demographic details of the cohort were studied. The clinical features like type of leprosy, lepra reactions, presence of disability/deformity and treatment details were studied in detail. The leprosy cases were classified according to the Ridley-Jopling and Indian Association of Leprologists (IAL) classification system (Ridley & Jopling 1966, IAL 1982). The WHO classification was used to denote cases into paucibacillary (upto 5 skin lesions and less than 2 nerve trunks) and multibacillary cases (6 or more skin lesions and 2or more nerve trunks) (WHO 1994, NLEP 2009).

Investigations

Blood hemogram, liver function tests, renal function tests, chest X-ray and ultrasound abdomen were the investigations done before starting treatment. Slit skin smear (SSS) were done in all the patients from 3 sites (ear lobe, skin lesion and normal skin) and positive smears were expressed in terms of Bacterial index (BI) and Morphological index (MI). Skin biopsy and nerve biopsy were done whenever required and the histopathology slides of the cohort were reviewed.

Statistical analysis

The data collected were analyzed in terms of descriptive statistics of mean, frequency and percentage.

Permission to conduct this study was sought from the Institutional Review Board of this institute who stated that since this was a retrospective, case records based study with no direct patient involvement, permission was not required.

Results

There were a total of 927 new leprosy cases in this 19 year retrospective study. Females constituted 258 new leprosy cases (n=258) of this total, thus accounting for a proportion of 27.83%. There were 87 (33.72%) paucibacillary cases (PB) and 171 (66.28%) multibacillary cases (MB) according to the WHO classification. The female/male ratio was 1: 3.59. The age group 41-50 constituted the maximum number of cases, 50 (19.38%). The mean age was 37.60 years. The youngest was 3 years of age and the oldest 77 years. The mean duration of illness was 2.08 years, the longest being 25 years and the shortest 4 weeks. Family history of leprosy was present in 13 cases (5.04%). Out of this 9/13 (69.23%) the contact was lepromatous leprosy (LL). The salient demographic and clinical details are given in Table 1. The different

Table 1 : The salient demographic and clinical features of female leprosy cases (n=258).

Total No.	Female /male ratio	Mean age (years)	Commonest age group (years)	Mean duration of illness (years)	Commo-nest type of leprosy	Lepra reactions	Grade 2 Disability	Pauci-bacillary treatment	Multi-bacillary treatment
258	1:3.59	37.60	41-50	2.08	Indeter-minate (47)	45	33	87	171

Table 2 : Types of leprosy with frequency and percentage in female patients (n=258).

Types of leprosy	Frequency	Percentage (%)
Indeterminate	47	18.22
Tuberculoid	5	1.94
Borderline tuberculoid	35	13.56
Borderline borderline	17	6.59
Borderline lepromatous	17	6.59
Lepromatous leprosy	17	6.59
Histoid	4	1.55
Pure neuritic	4	1.55

Table 3 : Types of leprosy in female children (1-12 years, n=19)

Types of leprosy	Frequency	Percentage (%)
Indeterminate	6	31.58
Tuberculoid	1	5.26
Borderline tuberculoid	12	63.16

subtypes of leprosy are given in Table 2. Indeterminate leprosy (I) was the commonest type of leprosy seen in this study accounting for 47 cases (18.22%) followed by BT, then BB/BL types (Table 2). Smear positive cases accounted for 38 cases (14.73%). There were 19 cases of leprosy (7.36%) in the childhood age (1-12 years). The types of leprosy in female children is given in Table 3. In childhood female leprosy, BT was the commonest type, 8/15 (53.33%). Lepra reactions were present in 45 cases (17.44%), 33 cases with Type 1 reaction and 12 cases with Type 2 reaction. Grade 2 disability was present in 33 cases (12.79%), with ulnar palsy accounting for 13 cases (39.39%). Patients who were defaulters and on irregular treatment accounted for 2 cases (0.78%). 87 cases (33.72%) were given PB treatment and 171 cases (66.28%), MB treatment.

Discussion

This 19 year retrospective study showed a prevalence of 27.83% of leprosy in females with a female/male ratio of 1:3.59. Head to head comparison with other studies is difficult as most studies have been done on the general prevalence and not gender wise. Studies on leprosy solely concentrating on females is lacking. In a recent retrospective (11 year) study done in Delhi, the proportion of leprosy in females was 25.62% with a female/male ratio of 1:2.9 (Relhan, et al 2016). A previous study from a urban leprosy center in Delhi showed a proportion of 25.57% (Tiwary et al 2011). Thus the proportion of leprosy in females in this study is comparable to other studies. Even though leprosy is predominant in males there has been an progressive increase in the prevalence in females in India in recent years. This reflects on the increasing awareness among females and better healthcare seeking attitudes. Moreover detecting and treating leprosy in females also brings down the prevalence in children as the latter have a greater chance of contact with their mothers than fathers. Universally leprosy is more prevalent in the male population. However another recent study done in Odisha showed a lower prevalence in females compared to the above studies (18%), with a female/male ratio of 1 : 4.55 (Kakkad et al 2016). Again another study done in Brazil showed a female preponderance of 55.4% compared to males (Santos et al 2013). The explanation given in the Brazillian study is that in the province of Brazil where this study was done, traditionally females have greater frequency of healthcare seeking attitudes than males and more literacy. The mean age in this study was 37.60 years which is comparable to the above quoted studies and our study. Family history of leprosy was present in 5.04% of the female cases and 69.23% the source of contact were their husbands who had LL. This is because LL is highly infectious and close contact among spouses facilitates the transmission of leprosy through nasal droplets (George et al 1993). In the study done in Delhi, the percentage in household contacts was 6.19%, but the type of leprosy in the contacts is not mentioned in this study (Relhan et al 2016).

Indeterminate leprosy (I) was the commonest type of leprosy seen in this study (18.22%). This is an unique finding in this study as most studies in India and abroad demonstrated BT as the commonest type of leprosy. In all age groups and gender, the commonest type of leprosy is BT. The increases prevalence in this study could be due to the high literacy rate in this state in females (highest in India) which leads to increased awareness and early health care seeking attitudes, especially for hypopigmented macules. Early diagnosis and treatment can cure HD (I) cases before they go to the other types of leprosy. It is also possible that low prevalence of HD (I) in other studies could be due to misdiagnosis as a large number of dermatoses can mimic HD (I). In the study done in Brazil, also showed a high prevalence (33.6%) of Indeterminate leprosy (Santos et al 2013). But this study also included histopathologically diagnosed cases of Indeterminate leprosy. Many cases of clinically diagnosed TT and BT may show histologically only Indeterminate findings (Vargas-Ocampo 2004) and thus the aforementioned study in Brazil may not reflect the true prevalence of HD (I). The prevalence of smear positive cases (Histoid, LL, BL) in this study was 14.73%. The smear positivity in other studies ranged from 10% in India (Kakkad et al 2016) to 62.5% in Brazil (Santos et al 2013). Most of the other studies have not quoted the smear positivity, gender wise. Smear positive leprosy cases in females has got grave epidemiological significance as they have higher

chances of transmitting the disease to their children with whom they are often in close contact (Jesudasan et al 1984). The proportion of histoid leprosy (HL) in females in this study was low (1.55%). In the above quoted studies there were no HL cases. The prevalence of HL in females is generally low, but even the few cases present are significant from the epidemiological point of view because these cases are highly infectious and they harbor drug resistant mutant forms (Nair & Kumar 2013). The prevalence of lepra reactions in females in this study was 17.44%. This prevalence could not be compared with the other aforementioned studies as they have quoted only the general prevalence of reactions and not gender wise. The Grade 2 disability in the present study was found to be 12.79%. Ulnar palsy was the commonest deformity noted. This is similar to the deformity pattern in males (Monteiro et al 2015). Grade 2 disability in leprosy cases indicates late diagnosis or delayed treatment and is considered unfortunate in this post-elimination period of leprosy as the greatest stigma of leprosy is still the deformity, even today. The prevalence of childhood female leprosy cases (1-12 years) in this study was 7.36%, out of which BT was the commonest type of leprosy (53.33%). This is similar to other studies (Jain et al 2002). However the incidence of childhood leprosy indicates smoldering infection in the community and presence of leprosy among their household contacts.

The percentage of irregular treatment/defaulters in this study was low (0.78%). This is another interesting finding in this study as it shows that educated and empowered females in a society like Kerala are more likely to maintain regular drug compliance then their male counterparts. No serious adverse effects to anti-Hansen therapy were seen in females in this study again indicating that females tolerate anti-Hansen therapy better.

Limitations of the study

This study was done in a tertiary care center and it is possible that more cases, especially the clinically florid cases were referred to our center and the prevalences and rates may not be a true indicater of the general trend in the community. Inability to properly compare with other studies due to paucity of similar studies is another limitation of this study.

Conclusions

The prevalence of leprosy in females in this study was 27.83%, with Indeterminate leprosy being the commonest type, smear positive cases were seen in 14.73%, grade 2 disability in 12.75% cases and childhood female leprosy cases accounted for 7.36%, with BT being the commonest type.

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