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Original Research Article

Study of clinico-epidemiological profile of leprosy patients at tertiary care center

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ABSTRACT

Background: Leprosy is often mentioned as the oldest disease known to man, the origins of which are lost in the mists of antiquity. In spite of having been declared eliminated in December 2005 from India as a public health problem, India has still 60% of the entire global case load.
Methods: A total of 60 Leprosy patients belonged to Ujjain and its adjoining districts, attending the outpatient department of dermatology at R.D Gardi medical college, Ujjain (M.P.). Over a period of 1 year i.e. January 2019 to December 2019 constituted the subject material for study. The data was analysed for clinico-epidemiological characteristic and relevant investigations were done.
Results: A total of 60 patients attended the leprosy clinic during the study period. Maximum number of patient belonged to age groups of 21-40 years. Male preponderance with M:F ratio was 3:1. Family history was seen in 3 patients (5.0%). 73.3% patients were from rural area. Borderline tuberculoid (19 patients) was commonest clinical presentation and 2 cases of childhood leprosy were recorded.
Conclusions: The present study gives a general picture about the current trends of Leprosy in this particular region and highlights the importance of clinico-epidemiological profile and relevant investigations. This study emphasizes the need of spread of awareness about the disease, facilities for investigation and early diagnosis.

Keywords: Leprosy, Central India, Epidemiology, Clinico-epidemiological

INTRODUCTION

Epidemology of leprosy deals with distribution of disease in population according to various factors such as age, sex and determinants of the disease like agent, transmission and host.

Geographical distribution

Currently around 1,26,164 new cases were detected annually (Year 2017-18) with PR 0.67 per 10,000 population and ANCDR (annual new case detection rate) 9.27 per lakh population. More than 85% of global burden is currently seen in the following seven countries and India contributes to around 60% of the burden (Table-1).[1]

Leprosy in India

State of Chhattisgarh and Dadra and Nagar Haveli (U.T.) have remained to achieve elimination. Other states namely Bihar, Jharkhand, Odisha and Lakshadweep (UT) have reported PR >1/10,000 population, as on 31 March 2018. India identified as many as 1,26,164 new Hansen's disease cases during the year 2017-18 with a MB proportion of 50.9% and the proportion in females was 38.8%. During the period 10,287 (8.15%) child cases and

4552 (3.61%) Grade 2 disability cases were detected, making a concern for continued transmission and delayed case detection.[1]

Table 1: Number of leprosy patient in seven countries.[1]

Country	Number
India	1,26,164
Brazil	26,875
Indonesia	15,910
Bangladesh	37,54
Democratic republic of Congo	3,649
Nepal	3215
Ethiopia	3,114

With prevalence of 57.8/10,000 in 1983, India has be successful with the implementation of MDT in bringing the national prevalence decline to elimination as a public health problem of less than 1/10,000 in December 2005 and even further down to 0.66/10,000 in 2016.[2] In the state of Madhya Pradesh annual new case detected during 2016-17 were 98 and prevalence rate per 10000 as on March 2017 was 0.30 in district Ujjain.[3]

Social stigma arising out of fear, ignorance and superstitious beliefs continue to be a major stumbling block in leprosy control measures. Another added cause is appearance of drug resistant strains of *M. leprae*, problem of microbial persistence and inadequate and untimely treatment. Hansen's disease is eliminated from India in terms of statistical prevalence but from disease problem point of view it still poses many challenges. In unavailability of vertical program, active case finding is not there. The medical facility at the peripheral level must be equipped to spot leprosy and to arrest the transmission and disability. Current study carried out in a tertiary care centre situated in Ujjain, Madhya Pradesh provides general picture about the current trends of leprosy in the region and highlights the importance of clinico-epidemiological profile and relevant investigations, also emphasizing the need of spreading the awareness of disease, facilities for investigation and early diagnosis.

METHODS

Current study was a tertiary hospital based observational study of newly diagnosed leprosy patients in general population attending outpatient department of dermatology, R. D. Gardi medical college and C. R. Gardi hospital, Ujjain. This study was carried out in a time period of 1 year extending from January 2019 to December 2019.

Inclusion criteria

Male and female patients of all age groups and patients who had given consent were included in the study.

Exclusion criteria

Exclusion criteria for current study were; patients who were not cooperative or not willing to participate in the study, all old patients with diagnosed leprosy cases already on treatment and patients with terminal illness.

Total sixty (60) patients with clinically diagnosed leprosy were chosen and after approval of Institutional Ethics Committee the written consent was taken. A detailed history of age, gender, occupation and socioeconomic status was taken and detailed general examination was carried out in all the patients. Local examination of skin lesions was carried out. All the peripheral nerves were palpated for enlargement.

All routine investigations as well as special investigation like slit-skin smear and biopsy were done. The findings were recorded in the prestructured proforma. The results were analyzed and discussed in detail.

Data analysis

All statistical analysis was done using statistical software SPSS 20.

RESULTS

An observational study of 60 consecutive patients of leprosy attending C. R. Gardi hospital, Ujjain was done during January to December 2019 (1 year of duration). Patients were diagnosed and classified on the basis of Ridley and Jopling classification. The mean age of the leprosy patients was 42.95 years with age ranging from 12 to 80 years. Maximum number of patients belonged to age group of 21-40 years. Childhood cases (≤15 years) were only 2 in number. The study included 45 males and 15 females with male female ratio of 3:1.

Positive family history of leprosy was found only in 3 patients (5.0%). Illiterate (58.3%), Hindus (93.3%), rural inhabitants (93.3%), married individuals (88.3%), Patients from lower socio-economic status (58.3%) and semi-skilled worker formed the bulk of the patients enrolled (Table 2).

Lesions most commonly presented in form of patches (50 patient) and plaques (38 patients) mostly distributed on extremities (upper and lower limbs) and more commonly in asymmetrical fashion (90%). Majority of clinical lesion were anesthetic (53.3%), presenting with hypopigmentation in the surface involved (83.3%).

On neurological examination, ulnar nerve was commonest to be involved followed by lateral popliteal nerve. Pattern of nerve involvement was predominantly multiple asymmetrical (50 patients) and tingling and numbness and sensory loss (65%) were chief neurological complaints elicited. Proportion of hand and

foot deformity were also significant in 10 patients with ulcers being the most common issue (11.6%).

Table 2: Distribution of patients according to their socio-demographic characteristics.

Socio-demographic characteristics		Frequency	%
Age groups (years)	0-20	7	11.7
	21-40	24	40
	41-60	23	38.3
	61-80	6	10
Mean age 42.95±15.54 years			
Gender	Male	45	75
	Female	15	25
Educational status	Illiterate	35	58.3
	Literate	25	41.7
Religion	Hindu	56	93.3
	Muslim	4	6.7
Place of resident	Rural	44	73.3
	Urban	16	23.7
Marital status	Married	53	88.3
	Unmarried	7	11.7
Socio-economic status	Upper	0	0.00
	Upper middle	3	5.00
	Lower middle	10	16.7
	Upper lower	12	20.0
	Lower	35	58.3
Occupation	Business	1	1.70
	Driver	2	3.30
	Engineer	1	1.70
	Farmer	20	33.3
	House wife	10	16.7
	Labour	21	35.0
	Service	2	3.30
	Student	3	5.00

Figure 1: Infiltrated skin lesions, Saddle nose in a 14 year old child presenting with LL polar variant.

Out of 60 clinically diagnosed cases of Hansen's disease, 3 patients (5.0%) were diagnosed as tuberculoid leprosy

Figure 2: BT Lesion over face with type-I reaction causing partial facial nerve palsy.

(TT), 19 patients (31.7 %) as borderline tuberculoid (BT), 8 patients (13.3%) as mid borderline leprosy (BB), 17 patients (28.3%) as borderline lepromatous leprosy (BL) and 13 patients (21.7%) as lepromatous leprosy (LL) (Table 3 and Figure 1). So, Border line leprosy dominated the figure with BT being the commonest variant. MB cases outnumber PB cases by a ratio of 1.75:1. Slit skin smear (SSS) was found positive in 36 patients (60.0%) and negative in 24 patients (40.0%). It was 100% positive in all cases of BL and LL.

Only 9 patients developed lepra reaction. Type I reaction in 2 patients and type II reaction in 7 patients was seen (Figure 3). Patients developing type I reaction (Figure 2) belonged to BT and that of type II reaction in LL subtype.

Table 3: Distribution of Hansen's patients on basis of clinical diagnosis.

Clinical Diagnosis (n=60)	N	%
TT	3	5.0
BT	19	31.7
BB	8	13.3
BL	17	28.3
LL	13	21.7
Total	60	100.0

Table 4: Comparison with gender.

Author	Male (%)	Female (%)	Total (%)	M:F ratio
Present study	75	25	100	3:01
Kautuk et al[4]	69.3	30.7	100	2.3:1
Verma et al[9]	64.6	35.4	100	-
Mahajan et al[5]	68.69	31.31	100	2.2:1.
Mehta et al[10]	-	-	100	2.3:1
Jayalax-mi et al[11]	73.68	26.31	100	2.8:1

Figure 3: Infiltrative tumid nodules and plaques in a case of LL.

DISCUSSION

In the present study, age of the patients ranged from 12-80 years with maximum number of patients in age group of 21-40 years. Age distribution of the present study was comparable with other studies like Kautuk et al, Mahajan et al.[4,5] This could be due to more chances of exposure, opportunities for infection and increased awareness regarding seeking medical advice in this age group.

Globally, proportion of new child cases is 8.8% (WHO, globally leprosy update 2015).[6] It is an indicator of active transmission of disease in the community. In our study, childhood leprosy (≤15 years of age) were found in only 2 patients (3.3%). This proportion is lower than that reported by Chhabra et al (9.3%) and by Singal et al 9.6%).[7,8] The number of males in the present study was 45 (75%) and the females were 15 (25%) with a male to female ratio was 3:1 which shows males comprised the majority of our patients. Similar gender ratio is also demonstrable in other studies shown (Table 4). Although male gender bias has been associated with leprosy since the sulfone era, much greater male dominance over female might be due to their greater mobility and increased access to health facilities.

In the present study, majority of the patients were illiterate, semi-skilled by occupation and belonged to lower socio economic status. The results were comparable with other studies done by Verma et al, Doshi et al, Mehta et al.[9-11]

Educational status of leprosy cases emphasizes on the unawareness and lack of information among common people about leprosy. The socioeconomic status reflects that leprosy is a disease of the poor and low socio-economic strata person surviving in over-crowding home condition.

In the study, 73.3% patients belonged to rural areas. Though a similar kind of study from Maharashtra concluded that new case detection rate and prevalence of leprosy were greater in urbans areas Doshi et al.[12] This disparity can be explained by the fact that our hospital drains a lot of rural population from western Madhya Pradesh and Rajasthan border areas.

Table 5: Comparison with clinical diagnosis.

Clinical Diagnosis	TT	BT	BB	BL	LL	IL	Total
Present study (%)	5.0	31.7	13.3	28.3	21.7	-	100
Singh et al[25]	15	19	-	12.5	22.5	2.5	100
Tekwani et al[20]	8.88	62.2	2.96	17.77	5.92	-	100
Mehta et al[10]	24	29	6	21	20	-	100
Shivswamy et al[21]	17.5	38.4	2.7	13.1	12.6	15.7	100
Sharma et al[22]	7.7	33.6	33.6	6.9	11.7	7.5	100
Bhushan et al[23]	8.2	78.7	-	8.2	4.9	-	100
Jayalaxmi et al[11]	25.0	38.16	-	11.84	25	-	100

Table 6: Comparison of slit skin smear.

Author	AFB present (%)	AFB absent (%)	Total cases
Present study	60	40	100
Mahajan et al[5]	54.01	45.89	100
Mehta et al[10]	88.89	11.11	100
Ganpati et al[16]	30.7	69.3	100
Jayalaxmi et al[11]	44.73	55.27	100

Table 7: Comparison of overall clinico-histopalhological correlation.

Authors	Overall clinic histopathological correlation (%)
Present study	75.0
Singh et al[25]	82.5
Tekwani et al[20]	72.59
Sharma et al[22]	53.44
Moorthy et al[26]	62.63
Bhushan et al[23]	60.60
Ridley et al[27]	68.30

Positive family history could be elicited in 5.0% of the cases in the present study. This observation is slightly on lower side as compared to observations of other studies by Mahajan et al, Mehta, Salodkar.[5,10,13] This stresses importance of family contact as a source of infection where the source and susceptible individual are close to each other.

In the present study, majority of the patients (75.0%) presented with their complaints within 2 years. The results were comparable with study of Nigam et al.[14] 72% of our patients had more than one lesion, which is not in conformity with the previously published study of Selvasekar et al.[15] This can be explained as people may ignore a single lesion and might not come to tertiary hospital for such a minor ailment.

The morphology of the lesions was varied in different studies like Ganpati et al.[16] Hypopigmented plaques followed by patches were the most common type of lesions in our patients. The distribution of leprosy lesion also varies in different studies as shown by Selvasekar et al.[15] The majority of the patient (84.0%) in the present study had lesions on extremities, which was in agreement with Chaudhary et al.[17]

In the present study, deformities were present in 20.0% of patients. A higher occurrence of deformities were noted by Kautuk et al (50%), Mahajan et al (40.11%), Mehta et al (53.33%) and Jindal et al (54.47%).[4,5,10,18]

Ocular features were noted in 13.4% of patient in the present study which was higher than that of Jindal et al and lower than that of Mahajan et al.[5,18] Tegta et al noted eye involvement in 8.6% patients with conjunctivitis being the most common as in our study.[19]

In the present study, BT (19 patients) was the commonest clinical spectrum as in other studies also; Tekwani D et al, Mehta B et al, Shivswamy KN et al, Sharma et al, Bhushan et al.[10,20-23] In current study, the proportion of MB cases were 63.33% and PB cases were 37.67%. Similar findings were shown by study done by Kurup et al also where MB and PB cases were 71.9% and 26.6% respectively.[24]

Multibacillary leprosy (MB) cases are clinically important as they are a major reservoir of infection and also predisposed to reactions and subsequent deformities. The greater proportion of MB cases in our study is probably due to fact that our hospital caters to the very under privileged section of society in western Madhya Pradesh (Table 5).

Lepra reactions were noted in 15% patients of the study with type-II reaction being more than 3 times more common than type-I reaction. Almost similar findings regarding lepra reaction were given by Salodkar et al where 11% cases with type-II reactions presented 4 times more frequent than type-I Reaction.[13] High proportion of reactions might be attributed to the fact that many patients seek medical advice only when they develop reactions and our study included good number of LL cases (13 patients) as well.

In the present study, 60% cases showed acid-fast bacilli on slit skin smear. The difference in other studies might relate to difference in the clinical presentation of the disease at the time of study (Table 6). This stresses on importance of carrying out bacteriological index especially in the borderline group, which shows a continuous shift in the immunological spectrum.

In the present study of 60 newly diagnosed cases of Hansen's disease, overall parity observed was 75.0% (Table 7). This was intermediate within the results of other studies. The difference in clinical and histopathological diagnosis may relate to size and site of the biopsy, age of the lesion and immunological status of the patient at the time of taking biopsy. Serial biopsies form the same lesion or form paired lesions is advisable for more accurate histopathological correlation.

CONCLUSION

In spite of decline in leprosy cases at national level, it surely continues to be a health concern. Predominance of MB cases and finding of disease in rural population in this study emphasizes the need of spread of awareness about the disease, facilities for investigation and early diagnosis and unhindered provisions of therapy to prevent deformities. Although this study was a retrospective tertiary hospital based, still it gives a general picture about the current trends of Hansen's disease in this particular region. This study concludes that reason of delay in diagnosis of leprosy patients is that they had not reached to right place in right time due to illiteracy, unawareness, ignorance, low socio economic status and social stigma about this disease.

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