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Original Research Article

Study of socio demographic factors among persons affected by leprosy in Kurnool division of Kurnool district, Andhra Pradesh, India

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ABSTRACT

Background: Leprosy is an age old disease. Leprosy is an important cause of preventable disability. Physical impairment associated with leprosy is usually secondary to nerve damage. The aim of the present study was to study the socio demographic factors among persons affected by leprosy and to determine the association between socio demographic factors and WHO grade of disability.
Methods: This is a community based cross–sectional study conducted in administrative limits of Kurnool division of Kurnool district from November 2013-May 2014. Information collected was socio demographic variables like age, sex, religion, educational status, marital status, income, socioeconomic status, type and size of family.
Results: 65/276 (23.56%) of the study subjects had disabilities. Out of which 9.06% had only Grade 1 and 14.50% had Grade 2 disability. 10.14% of study subjects had sensory impairment in hands, 5.79% had sensory impairment in feet and 2.90% had sensory impairment in both hands and feet. Grade 1 & Grade 2 disability was more common in >60 years of age (32.26%), males (16.67%), unskilled workers (23.63%), Illiterates (21.56%) and lower socio economic status (20.37%).
Conclusions: Disability among persons affected by leprosy was more common in geriatric age compared to other age groups. As age increases the number of deformed cases also increased. Deformities were more among male patients, multi bacillary cases, doing unskilled occupations that have more chance of getting injuries and illiterates and poor socio economic group patients. Sensory Impairment was more common in hands compared to feet.

Keywords: Disability/Deformity, Leprosy, Socio demographic factors, WHO grading of disability

INTRODUCTION

Leprosy is an age old disease. As there was no known remedy for the disease in the earlier days, the viciousness of the disease, disfigurement and disability caused by the disease resulting in making the affected persons suffer heavily, led to a number of myths, misconceptions, apprehensions and inhibitions in the minds of people. This resulted into developing such a high degree of stigma against the disease that the community wanted to avoid all contacts with such persons. Now there is cure for leprosy and patients can live in their home during treatment. Because of early treatment, deformities and disabilities have reduced.

Yet, there is discrimination against the person affected by leprosy, which need to be removed from the public mind, so that these persons can lead normal life like any other human being.[1] Leprosy is an important cause of preventable disability.

Physical impairment associated with leprosy is usually secondary to nerve damage. Impairments may give rise to disabilities, such as limitations of activities involving the use of hands, feet and eyes, and restrictions in social participation. Multi-drug treatment (MDT) can cure leprosy and if instituted early can prevent disability. However, leprosy is still often diagnosed too late, when permanent impairment has already occurred. Even after completion of treatment, a significant proportion of patients sustain disability from nerve damage, requiring continued self-care to limit further secondary damage.[2]

Future projections of the global leprosy burden show that 5 million new cases would arise between 2000 and 2020, and that in 2020 there would be an estimated 1 million people with WHO Grade 2 disabilities.[3] Though introduction of MDT has reduced the incidence of disability drastically, the total disability load in the world is estimated to be about 3 million.[4] In India a total of 1.27 lakh new cases were detected during the year 2013-14, which gives Annual New Case Detection Rate (ANCDR) of 9.98 per 100,000 Population. This shows decrease in ANCDR by 7.4% from 2012-13 (10.78). A total of 5256 Grade 2 disability detected amongst the New Leprosy Cases during 2013-14, indicating the Grade 2 disability Rate of 4.13 / million population.[5]

Kurnool is one of the districts having ANCDR more than national average (>10/100000) and the percentage of new cases with Grade 2 deformity of more than the National average (>3%).6 There is need to identify reasons for this high prevalence and high Grade 2 deformity rate. Hence it was chosen to conduct the study in this area.

The aim of the present study was to study the socio demographic factors among persons affected by leprosy and to determine the association between socio demographic factors and WHO grade of disability.

METHODS

This is a community based cross–sectional study conducted in administrative limits of Kurnool division of Kurnool district from November 2013 – May 2014. Kurnool district is divided into Kurnool, Adoni and Nandyal revenue divisions. Among these Kurnool division was selected by simple random sampling. Study population includes all persons affected by leprosy who were registered between 1st May 2012 to 31st October 2013 and utilized/utilizing the services from the leprosy treatment units. (As per the data available at the District Leprosy Office, Kurnool).

The study was taken up after the approval of the Ethical committee of the Kurnool medical college, Kurnool. During the study, purpose of the study was explained to all study subjects in his/her own language and informed verbal consent was taken. A pilot study was conducted in Kallur PHC area with the objective of standardizing the questionnaire and to know the feasibility of study. Permission was obtained from the District Leprosy Officer, Kurnool District to carry out the study.

The District Leprosy Office maintains a register of all leprosy patients in the district. For the study purpose, information and address of all registered patients between 1st May 2012 to 31st October 2013 was obtained from the register. Each of the available registered case was contacted in person by the investigator and interviewed using a pretested, semi structured questionnaire. In case of patients living in hilly and remote areas and those missed during visit to their houses, the medical officers of the respective PHCs were contacted and requested to pool the cases in their administrative limits and intimate the same to the investigator for the study purpose.

Information was collected from these patients by interview method and examination using a pre tested, semi structured questionnaire. Information collected was socio demographic variables like age, sex, religion, educational status, marital status, income, socioeconomic status, type and size of family. Statistical analysis was done by using Percentages, Chi square test, Kruskal wallis test to test the association between socio demographic factors and grade of disability using SPSS Software (20th Version).

RESULTS

It was observed from the Table 1 that maximum number of patients in the study population was in the 15-59 years of age group. Adults comprised of 92.03% (254), children and geriatric individuals affected with leprosy constituted 7.97% (22) and 11.23% (31) respectively. Among MB cases, majority of study subjects (67.33%) were ≥ 30 years of age and among PB cases, majority of study subjects (54.77%) were less than 30 years of age. This difference was significant. The youngest age reported was 6 years. Mean age of study population was 34.75 years.

In the study population 63.04% (174) of them were males and 36.96% (102) were females. This is similar to national average of females which is 36.91%. Among MB and PB cases, majority of study subjects were males (64% and 61.90% respectively). This was not significant.

More than one third of the study population (42.03%) were illiterates followed by educated up to primary school (29.35%), 11.23% were educated up to high school, 7.98% were studied up to upper primary school, 6.15% had received education up to intermediate and 3.26% were graduates. Among MB and PB cases, majority of study subjects were illiterates and who studied up to primary class (76% and 65.86% respectively). This was not significant.

54.34% (150) of the study population were married and in stable relation and 32.60% (90) were single, 7.98% (22) were widow / widowed and 5.08% (14) were

separated. But there was no legal separation in the study population. Among MB cases majority of study subjects were married and in stable relation (60%) and among PB cases majority were single, separated and widow/ widowed (52.37%). This difference was statistically significant.

Table 1: Distribution of study population according to socio demographic factors.

Socio demographic factors	Type of leprosy				Total		P value
	MB No	(%)	PB No	(%)	No	(%)	
Age group							
≤14	5	(3.33)	17	(13.50)	22	(7.97)	0.000
15-29	44	(29.34)	52	(41.27)	96	(34.78)	
30-44	46	(30.66)	29	(23.02)	75	(27.17)	
45-59	37	(24.67)	15	(11.90)	52	(18.85)	
≥60	18	(12)	13	(10.31)	31	(11.23)	
Gender							
Male	96	(64)	78	(61.90)	74	(63.04)	0.719
Female	54	(36)	48	(38.10)	102	(36.96)	
Education							
Illiterate	67	(44.67)	49	(38.88)	116	(42.03)	0.063
Primary school	47	(31.33)	34	(26.98)	81	(29.35)	
Upper primary school	11	(7.33)	11	(8.74)	22	(7.98)	
High school	12	(8)	19	(15.08)	31	(11.23)	
Intermediate	9	(6)	8	(6.35)	17	(6.15)	
Graduate	4	(2.67)	5	(3.97)	9	(3.26)	
Marital status							
Single	35	(23.33)	55	(43.65)	90	(32.60)	0.039
Married and in stable relation	90	(60)	60	(47.63)	150	(54.34)	
Separated	10	(6.67)	4	(3.17)	14	(5.08)	
Divorced	0	(0)	0	(0)	0	(0)	
Widowed/widow	15	(10)	7	(5.55)	22	(7.98)	

Table 2: Distribution of study population according to Socio demographic factors.

Socio demographic factors	Type of leprosy				Total		P value
	MB No	(%)	PB No	(%)	No	(%)	
Occupation							
Unemployed (including home maker)	29	(19.33)	22	(17.46)	51	(18.48)	0.007
Unskilled	80	(53.33)	47	(37.31)	127	(46.01)	
Semiskilled	19	(12.67)	13	(10.32)	32	(11.60)	
Skilled	12	(8)	12	(9.53)	24	(8.69)	
Clerical / shop owner / farm owner	4	(2.67)	9	(7.13)	13	(4.71)	
Semi professional	0	(0)	2	(1.59)	2	(0.73)	
Students	6	(4)	21	(16.66)	27	(9.78)	
Socio economic status							
Upper	4	(2.66)	8	(6.35)	12	(4.35)	0.173
Upper middle	10	(6.67)	9	(7.14)	19	(6.89)	
Lower middle	18	(12)	14	(11.11)	32	(11.59)	
Upper lower	22	(14.67)	29	(23.02)	51	(18.48)	
Lower	96	(64)	66	(52.38)	162	(58.69)	
Religion							0.254
Hindu	93	(62)	90	(71.43)	183	(66.31)	
Muslim	26	(17.34)	16	(12.70)	42	(15.22)	
Christian	31	(20.66)	20	(15.87)	51	(18.47)	

Table 2 shows that 46.01% (127) were unskilled workers, 18.48% (51) were unemployed including homemakers, 11.60% (32) were semiskilled workers, 9.78% (27) were students, 8.69% (24) were skilled workers, 4.71% (13) were clerical/shop owner/farm owners and 0.73% (2) was semiprofessional. Among MB cases majority of study subjects were unskilled workers (53.33%) and among PB cases majority were other than unskilled workers (62.70%). This difference was statistically significant.

Table 3: Distribution of study population according to WHO grading of disability.

WHO grading of disability*	Number	Percent
Grade 0	211	76.44
Grade 1	25	9.06
Grade 2	40	14.50
Total	276	100

*Grade 0= No deformity, Grade 1= loss of sensation, Grade 2 = visible deformity

More than half the study population 58.69% (162) belongs to lower socioeconomic class, 18.48% (51) belongs to upper lower class, 11.59% (32) belongs to lower middle, 6.89% (19) belongs to upper middle and 4.35% (12) belongs to upper class.

This shows that leprosy is more prevalent among lower socio economic class. Among MB cases and PB cases, majority of study subjects belongs to lower socio economic class (64% and 52.38% respectively).

More than half the study population 183 (66.31%) were Hindus, 51 (18.47%) were Christians and 42 (15.22%) were Muslims.

Among MB cases and PB cases, majority of study subjects were Hindus (62% and 71.43% respectively).

Table 4: Distribution of study population according to sensory impairment.

Sensory impairment	Present No (%)	Absent No (%)	Total No (%)
In Hands	28 (10.14)	248 (89.86)	276 (100)
In Feet	16 (5.79)	260 (94.21)	276 (100)
Both in hands and feet	8 (2.90)	268 (97.10)	276 (100)

It was observed from the Table 3 that 65/276 (23.56%) of the study subjects had disabilities. Out of which 9.06 % had only Grade 1 and 14.50% had Grade 2 disability. It was observed from the Table 4 that 10.14% of study subjects had sensory impairment in hands, 5.79% had sensory impairment in feet and 2.90% had sensory impairment in both hands and feet.

Table 5: Pattern of visible deformities among study population with Grade 2 disability.

Visible deformity type*	Number#	Percent
Scars/cracks in hand	6	15
Ulcers in hand	6	15
Claw hand	28	70
Scars/cracks in feet	3	7.5
Plantar ulcers	8	20
Lagophthalmos	2	5
Foot drop	3	7.5

*Above table includes individuals with multiple deformities; #N=40 (Total number of persons affected by leprosy with Grade 2 deformity)

It was observed from the Table 5 that among 40 persons affected by leprosy having Grade 2 deformity, 28 (70%) had claw hand, 8 (20%) had plantar ulcers, 6 (15%) had scars/cracks in hands and ulcers in hands each, 3 (7.5%) had scars /cracks in feet and foot drop each, and 2 (5%) had Lagophthalmos. It was observed from the table-6 that Grade 2 disability was more among aged more than 60 years (32.26%) followed by 45-60 age group (17.31%), 30-44 age group (14.66%), ≤14 years age group (9.09%) and 15-29 years age (8.33%) group. This shows Grade 2 disability was increasing with age.

Grade 1 disability was more among 45-59 age group (15.38%) followed by 15-29 age group (9.38%). It can also be observed that in the study population disability proportion was more among adults when compared to children. This difference was statistically significant.

Grade 1 & Grade 2 disabilities were more common in Male population (9.19% & 16.67% respectively) compared to Female population (8.83% & 10.78% respectively).

Grade 1 & Grade 2 disabilities were more common in Multi bacillary cases (12.67% & 25.33% respectively) than Pauci bacillary cases (4.76% & 1.59% respectively). This difference was statistically significant. Grade 2 disabilities were more common in unskilled workers (23.63%) followed by semi-skilled (9.38%), skilled

(8.33%), unemployed (7.84%) and students (3.71%).This shows that unskilled worker like manual workers have more chance of getting disabilities than other occupations. Grade 1 disabilities were more common in semiskilled workers (18.75%) followed by students (11.11%), unemployed (9.81%), unskilled (7.87%) and clerical/shop owner/farm owner (7.69%). This difference was statistically significant. Grade 1 disabilities were more common in illiterates (11.20%) and who studied up to intermediate (11.76%). This difference can be attributed to the fact that persons with higher qualifications are more aware of signs and symptoms of leprosy and treatment required for it than illiterates. This difference was statistically significant.

Table 6: Association between socio demographic factors and WHO Grading of disability.

	WHO Grading of Disability							P value
Socio demographic factors	**Grade 0**		**Grade 1**		**Grade 2**		**Total**	
	No	**(%)**	**No**	**(%)**	**No**	**(%)**		
Age group								
≤14	20	(90.91)	0	(0%)	2	(9.09)	22	0.007
15-29	79	(82.29)	9	(9.38)	8	(8.33)	96	
30-44	57	(76)	7	(9.34)	11	(14.66)	75	
45-59	35	(67.31)	8	(15.38)	9	(17.31)	52	
≥60	20	(64.51)	1	(3.23)	10	(32.26)	31	
Gender								
Males	129	(74.14)	16	(9.19)	29	(16.67)	174	0.207
Females	82	(80.39)	9	(8.83)	11	(10.78)	102	
Type of leprosy								
PB cases	118	(93.65)	6	(4.76)	2	(1.59)	126	0.000
MB cases	93	(62)	19	(12.67)	38	(25.33)	150	
Occupation								
Unemployed	42	(82.35)	5	(9.81)	4	(7.84)	51	0.003
Unskilled	87	(68.50)	10	(7.87)	30	(23.63)	127	
Semi skilled	23	(71.87)	6	(18.75)	3	(9.38)	32	
Skilled	22	(91.67)	0	(0)	2	(8.33)	24	
Clerical	12	(92.31)	1	(7.69)	0	(0)	13	
Semi professional	2	(100)	0	(0)	0	(0)	2	
Students	23	(85.18)	3	(11.11)	1	(3.71)	27	
Education								
Illiterates	78	(67.24)	13	(11.20)	25	(21.56)	116	0.002
Primary school	67	(82.72)	5	(6.17)	9	(11.11)	81	
Upper primary school	16	(72.73)	2	(9.09)	4	(18.18)	22	
High school	28	(90.32)	2	(6.45)	1	(3.23)	31	
Intermediate	14	(82.35)	2	(11.76)	1	(5.89)	17	
Graduate	8	(88.88)	1	(11.12)	0	(0)	9	
SES								
Upper	11	(91.67)	0	(0)	1	(8.33)	12	0.001
Upper middle	18	(94.74)	1	(5.26)	0	(0)	19	
Lower middle	30	(93.75)	2	(6.25)	0	(0)	32	
Upper lower	41	(80.40)	4	(7.84)	6	(11.76)	51	
lower	111	(68.52)	18	(11.11)	33	(20.37)	162	
Total	211	(76.44)	25	(9.06)	40	(14.50)	276	

It was observed that Grade 2 and Grade 1 disabilities were significantly more common in patients with lower socio economic status (20.37% and 11.11% respectively) followed by upper lower socio economic status (11.76% and 7.84% respectively). This difference was statistically significant. Grade 2 disabilities were more common in Illiterates (21.56%) followed by who studied up to upper primary school (18.18%), primary school (11.11%), intermediate (5.89%) and high school (3.23%). This shows Grade 2 disability was decreased with education.

DISCUSSION

This study was a community based cross sectional study to study the socio demographic factors among 276 persons affected by leprosy in Kurnool division of Kurnool district during November 2013 to May 2014. Leprosy was more common among 15-29 years of age group and MB cases were more among 30-44 years of age group. Most of the persons affected by leprosy were males, illiterates and married. Similar results observed in a study done by Francisco Carlos Félix Lana et al shows that among 1838 leprosy cases, 140 (7.61%) occurred in children under 15 years old.[7] A study done by L B Chavan et al among 105 cases in Nagpur city revealed that, child cases (≤15 years) constituted 18.10% and adults constitute 81.9% of cases.[8] In a study conducted by Nardi SMT et al among 277 registered leprosy cases 50.2% were males and 49.8% were females.[9] In a study by Wim H. van Brakel et al among 1339 people affected by leprosy 31.9% were illiterates, 43.2% were educated up to primary school and 24.2% were educated up to high school/ advanced education.[2]

In a study conducted by Singh et al it was observed that among persons affected by leprosy 61% were Hindus, 18% Muslims, 8% Christians and Sikhs constitute 13%.[10]

Leprosy was common in unskilled workers and persons belong to lower socio economic status according to modified BG Prasad SES Scale. A Samraj et al showed that 66.3% were Manual/ unskilled workers, 12.8% were skilled workers, 17.4% were students and 3.5% were unemployed.[11]

Similar results observed in a study done by Tutul Chatterjee et al, among 162 Persons affected by leprosy in Kolkata 58.64% were from lower Socio economic class, 20.99% were lower middle, 14.81% were in upper middle class and only 5.56% were from upper classes.[12]

54.34% (150) of the study population were married and in stable relation and 32.60% (90) were single, 7.98% (22) were widow / widowed and 5.08% (14) were separated. But there was no legal separation in the study population. 65/276 (23.56%) of the study subjects had disabilities. Out of which 9.06 % had only Grade 1 and 14.50% had Grade 2 disability.

Similar results observed in a study done by Gautham M Sukumar et al in Chamrajnagar, reported that out of 259 persons affected by leprosy 79.9% had no disability, 8.5% had grade 1 and 11.6% had grade 2 disability.[13] Similar results observed in a study done by Anil Kumar et al reported that 83.7% had no deformity, 7.79% had Grade 1 deformity and 8.44% had Grade 2 deformity.[14]

In a study conducted by Tutul Chatterji et al in 2012 it was observed that 60% of LAPs belongs to Grade 0 followed by 25% belongs to Grade 1 and 15% belongs to Grade 2.[15] Sensory impairment was common in hands compared to feet. Most common visible deformity was claw hand followed by plantar ulcers. In a study conducted by Sarkar et al in west Bengal, India, it was observed that sensory impairment in hands was 10.3%, in feet was 13.9% and in eyes was 2.9%.[15]

In a study conducted by Van Brakal WH et al reported that sensory impairment in feet was 47% and hands was 31%.[2] Study done by Melur Sukumar Gautham et al in Chamrajnagar, reported that among 30 LAPs with grade 2 disability, ulcers in hands present in 17 (56.7%), claw hand 18 (60%), scars/cracks in hand 17 (56.7%), scars/cracks in feet 13 (43.33%), plantar ulcers 6 (20%) and wrist drop 1 (3.3%).[16]

WHO Grade 1 and Grade 2 deformities were most common among above 45 years age group and males. Most of the deformities were present in MB cases. This study findings were similar in a study done by Melur Sukumar Gautham et al reported that Grade 1 and Grade 2 disabilities were seen significantly (P <0•01) more often among subjects aged over 60 years when compared to other age groups. This might be ascribed to longer duration of disease, associated co-morbidities, lack of self-care and decrease in immune function in older age groups.[16]

Similar results observed in a study done by Dr Pankaj kumar Jain et al in Gwalior district showed that among 182 persons affected by leprosy 42.19% of disability present 41-60 years age group, 37.5% in >60 years, 18.75% in 21-40 years and 1.56% in 0-20 years age group (p=0.322).[17] Similar results observed in a study done by Susilene Maria Toneli Nardi et al showed that disabilities increased with age (p=0.005).[18]

Similar findings were observed in a study done by Dr Pankaj kumar Jain et al in Gwalior district showed that among 114 persons affected by leprosy with disability 58.77% of disability was present in males and 41.23% disability present in females (p=0.839).[15] In a study done by RR Patt reported that the difference in prevalence of disability in males (1.89% and in females (2.14%) was not statistically significant. (p>0.05).[19]

Similar findings were observed in a study conducted by Dr. LB Chavan et al in Nagpur city among 105 persons affected by leprosy reported that Grade 1 and Grade 2 disabilities were more among Multi bacillary cases (35.4% and 25% respectively) than Pauci bacillary cases (17.5% and 1.7% respectively.) (p<0.001).[8]

Similar findings were observed in a study done by Sarkar J et al in West Bengal showed that Grade 1 & Grade 2 disability cases among persons affected by leprosy were more common in Multi bacillary cases (15.8% & 15.8% Respectively) than Pauci bacillary cases (7.7% & 2.3% Respectively) (p<0.001).[15] Visible deformity was common in unskilled workers who are more chance of getting injuries, illiterates and lower socio economic

group. The findings were similar in a study done by Dr Pankaj kumar Jain et al in Gwalior district showed that among 114 persons affected by leprosy with disability 52.63% of disability present in illiterates, 20.17% in who studied up to 10th class, 18.42% in who studied up to 5th class, 7.08% in graduates and 1.75% in post graduates (p=0.000).[17]

In a study done by RR Patt reported that the prevalence of disability was lowest among high socio economic group. 1.72% in Low socioeconomic group, 3.09% in Middle socio economic group and 0.95% in high socio economic group (p<0.001).[19] The findings were similar in a study done by Sarkar J et al in West Bengal showed that Grade 1 and Grade 2 disabilities were more among manual workers (18.5% and 14.3% respectively) than other occupations (8.6% and 6.4% respectively) (p=0.001).[15]

CONCLUSION

From the above findings it can be concluded that disability among persons affected by leprosy was more common in geriatric age compared to other age groups. As age increases the number of deformed cases also increased. Deformities were more among male patients, multi bacillary cases, doing unskilled occupations who have more chance of getting injuries and illiterates and poor socio economic group patients. Sensory Impairment was more common in hands compared to feet.

It is recommended to counsel patients at the beginning of MDT about certain basic facts about leprosy and to plan, organise and conduct health education campaigns periodically to all registered cases. Mass media tools need to be adequately utilised. Prevention and rehabilitation action should target uneducated, unskilled workers, older patients, those who had multi bacillary forms of leprosy and those who belong to poor socioeconomic status.

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