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Original Research Article

Risk Factors for grade 2 Disability in Leprosy at the time of Diagnosis

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Abstract
Background: *In the post elimination era of leprosy the major challenge posed by the disease is disability prevention and rehabilitation. Hence studies on disability burden in leprosy should be top priority of research.*
Objectives: *To document grade 2 disability due to leprosy at the time of diagnosis in patients above 12 years attending a tertiary referral centre and to determine the association between age, sex, diagnostic delay, multibacillary disease and leprareaction with grade 2 disability.*
Methods: *Retrospective analysis of case records of leprosy patients who attended a tertiary care centre from 1.1 2017 to 31.12.2018 was carried out to study the grade 2 disability pattern at diagnosis and its risk factors.*
Results: *During the study period 27/52 leprosy patients (51.9%) who attended our tertiary referral centre had grade 2 disability at diagnosis. Male sex, diagnostic delay, disease manifesting with neurological symptoms as initial event and disease requiring mulibacillary treatment were found to be statistically significant risk factors for grade 2 disability.*
Conclusions: *Our finding of more than 50% cases manifesting grade 2 disability at diagnosis highlights the role rehabilitation specialists in managing the disease. We propose leprosy need a multidisciplinary approach to improve the quality of life of the affected. Retrospective nature of the study and small sanple size were our limitations*
Keywords: *Leprosy, Multidisciplinary approach, Grade 2 disability.*

Introduction

Leprosy is still capable of producing lasting deformities and disabilities, despite the availability of effective chemotherapy to treat the disease. Most often, this results from failure to adopt protective life style modifications. Knowledge regarding how to protect anaesthetic hands and feet and how to take care of minor wounds is of utmost importance in arresting progression to disability and deformity. Many a times the disability will be minimal to start with, neglect and delay in addressing minor cuts and wounds over a period of time results in irreversible damage.

Treatment of leprosy is not merely providing multidrug treatment. Patients need to be evaluated in detail at first visit itself and in case of any nerve function impairment involving hands, feet and face should receive help from other specialities as well, depending on individual's requirement.

Recent studies suggest that significant number of leprosy patients (especially those attending a tertiary referral unit) have already developed grade 2

disability by the time of diagnosis (motor function impairment of hands or feet or vision worse than 6/60 or inability to count fingers at 6 metres from leprosy associated ocular involvement).[1,2,3,4] Nerve function impairment once developed is often not completely reversible. Even after successful completion of multidrug treatment patient may be leading a poor quality life if the disabilities arising out of the disease are not completely addressed. A multidisciplinary approach alone can solve this problem, especially involving Rehabilitation medicine and Dermatology departments

In this setting we thought it worthwhile to carry out a study to determine the percentage of leprosy patients who manifest grade 2 disability at the time of diagnosis and to identify any risk factors for the same.

Objectives

1. To document grade 2 disability due to leprosy at the time of diagnosis inpatients above 12 years attending a tertiary referral centre
2. To determine the association between age, sex, multibacillary disease and lepra reaction with grade 2 disability at initial presentation

Methodology

Study design: Retrospective descriptive Study

Study Subjects

Inclusion criteria: All patients above 12 years in the institution diagnosed to have leprosy (as per the cardinal criteria proposed by WHO) from 1st January 2017 to 31st December 2017 were included in the study.[4]

Exclusion criteria: Diagnosed patients from other centres were excluded.

Method: After obtaining ethical clearance from our centre, the retrospective data on age, sex and occupation were collected from previous records. Evolution of disease including initial symptom and the delay between the onset of symptoms and diagnosis were carefully noted in individual cases and the information on clinical features of nerve thickening and nerve function impairment with the site and size of skin lesions, were documented. Data on lepra reaction when present were noted. A clinical diagnosis of type 1 lepra reaction was made when a patient in the borderline spectrum of leprosy had acute onset of erythema and oedema of skin lesions with or without neuritis and oedema of the hands, feet and face. Type 2 lepra reaction (T2R) was diagnosed when a borderline lepromatous orlepromatous leprosy patient had crops of tender subcutaneous skin lesions with or without accompanying neuritis, iritis, arthritis, orchitis, dactylitis, lymphadenopathy, oedema and fever. [5]

Grade 2 disability at the time of diagnosis was carefully noted as per WHO grading of disability.[4, 6]

Hands and feet

Grade 0 No anaesthesia, no visible deformity or damage

Grade 1 Anaesthesia present, but no visible deformity or damage

Grade 2 Visible deformity or damage present Eyes

Grade 0 No eye problem due to leprosy; no evidence of visual loss

Grade 1 Eye problems due to leprosy present, but vision not severely affected as a result (vision: 6/60 or better; can count fingers at 6 metres).

Grade 2: Severe visual impairment (vision worse than 6/60; inability to count fingers at 6 metres); also includes lagophthalmos, iridocyclitis and corneal opacities.

The treatment received were recorded. Data was analysed by SPSS software. Statistical significance was assessed by chi-square test and p value less than 0.05 was considered as significant.

Results

Study population comprised 52 patients of which 33 were males (63.5%) and 19 females (36.5%) as in Table1. Mean age of the study group was 35.9 years with a standard deviation of 14.8 years. Time interval between onset of symptoms and diagnosis varied from one month to eighty four months in study subjects. The initial symptom pertaining to leprosy was skin lesions in 37 cases (71.2%) and neurological symptoms in 15 patients (28.8%)[Fig 1]. Forty one patients (78.8%) required

multibacillary treatment with three drugs (rifampicin, dapsone andclofazimine) and eleven patients (21.2%) required paucibacillary treatment with two drugs (rifampicin, dapsone) [Fig 2]. Fourteen patients (26.9%) had leprareacton at the time of diagnosis and all were type 1lepra reactions.

Twenty seven (51.9%) patients manifested grade 2 disability at the time of diagnosis.

The cause of grade 2 disability was motor nerve palsy of hands or feet in 22 (42.3%) cases and trophic ulcer of base of great toe in three patients (5.8%) and motor nerve palsy of hands or feet along with trophic ulcer affecting base of great toe in two cases (3.8%).

Most common cause of grade 2 disability was ulnar claw hand in 16 patients (30.8%). Foot drop was observed in 5 patients (9.6%) and median nerve palsy was documented in three cases (5.8%).

None in the study group had facial nerve involvement or ocular manifestations due to leprosy.

Six out of nineteen (31.6%) females and twenty one out of the thirty three males (63.6%) had grade 2 disability at the time of diagnosis. This was statistically significant (p value 0.04).

Mean age of patients who manifested grade 2 disability at the time of diagnosis was 37.9±12.8 years while the same documented in patients without grade 2 disability was 33.8±16.6 years. This was statistically insignificant.

Mean time interval between onset of symptoms and diagnosis was 11.3±11.5 months in patients without grade 2 disability and 21.7±21.3 months in those with grade 2 disability and this was statistically significant with a p value of 0.03.

15/37 patients (40.5%) whose initial symptom was skin lesion and 12/ 15 (80%) whose initial symptom was neurological manifested grade 2 disablilty at diagnosis which was statistically significant (p value 0.01) [Figure 1].

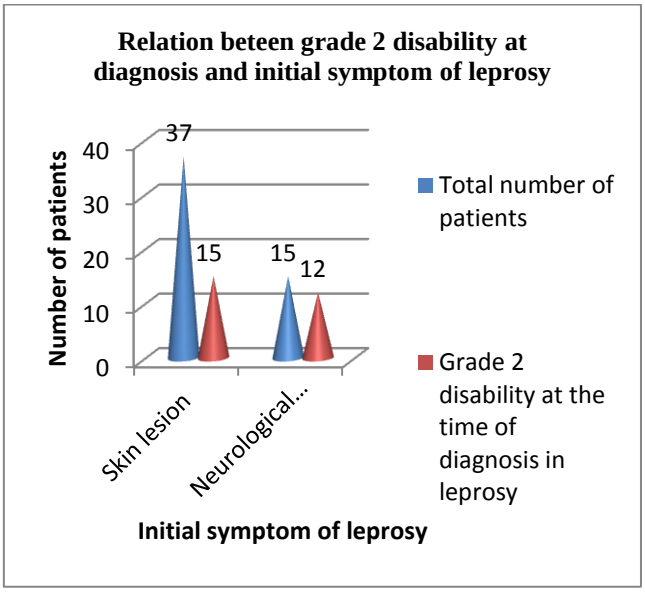

Figure 1: Relation between grade 2 disability at diagnosis and initial symptom of leprosy

26/41 patients (63.4%) who required multibacillary treatment and 1/11 patients (9.1%) who needed paucibacillary treatment had grade 2 disability at the time of diagnosis [Figure 2]. This was found to be statistically significant (p value 0.00)

Table 1: Gender and age of patients with grade 2 disability at the time of diagnosis

	< 15 years			16 -30 years			31 - 45 years			46 -60 years			61 -75 years			Total patients		
	M	F	Total	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
Patients wih grade 2 disability at the time of diagnosis	0	1	1	5	3	8	7	1	8	8	1	9	1	0	1	21	6	27
Total number of patients	1	3	4	9	7	16	11	6	17	10	3	13	2	0	2	33	19	52
% of atientswih grade 2 disability at the time of diagnosis	0 %	33.3 %	25%	55.6 %	42.9 %	50%	63.6%	16.7 %	47.1%	80%	33.3 %	69.2 %	50%	0 %	50 %	63.6 %	31. 6 %	51. 9%

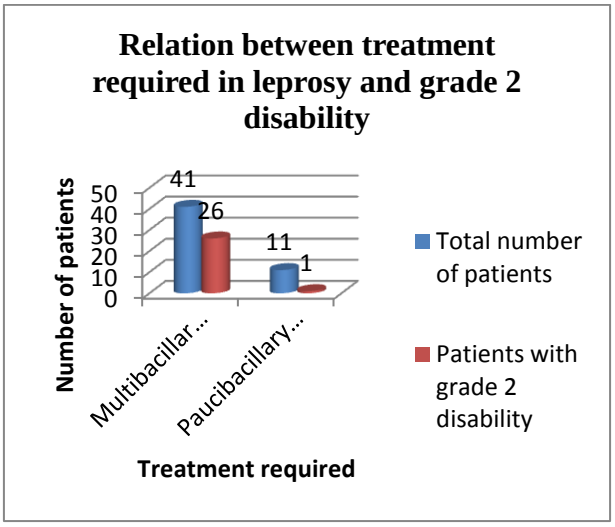

Figure 2: Relation between treatment required in leprosy and grade 2 disability at diagnosis

11/14 (78.6%) who had T1R, manifested grade 2 disability while 26 of 38 patients (68.4%) without T1R manifested leprareaction. This was also found to be statistically significant (p value 0.02).

Discussion

Our finding of significant number of study population manifesting grade 2 disability at the time of diagnosis was similar to other studies.[7, 8]Contrary to the finding of Sarkaret al who reported feet as the most common site for disability, ulnar clawing was the major cause of grade 2 disability in most of our patients (16 patients. 30.2%).[9] A similar finding was documented by Ahmad et al.[8]

Male sex, diagnostic delay, patients requiring multibacillary treatment and lepra reaction at the time of diagnosis were found to be statistically significant risk factors for grade 2 disability at presentation.

Higher rate of disability noted inmales andin patients requiring multibacillary treatment by us were comparable to existing data.[8, 10]

Our observation of age not being a statistically significant risk factor for leprosy was contrary to the earlier finding of advanced age as a risk factor. [8, 11] This disparity could be due to the sample size in our study.

Long duration, diagnostic delay and lepra reactions were once again reiterated as an important causes of grade 2 disability.[8, 9, 10, 11]

50% patients manifesting grade 2 disability at the time of diagnosis as observed by us indicates the need for a comprehensive approach in managing the disease. Early diagnosis and treatment is advocated as an important measure for disability prevention in leprosy; but more nerve palsies and thus more disabilities can be expected with initiation of multidrug treatment since increase in lepra reactions are an anticipated occurrence while on treatment.[2]

The limitations of our study were small sample size and its retrospective nature.

Recent onset leprosy induced palsy and nerve palsy associated with leprous neuritis are known to respond to systemic steroids co-administered with multi drug treatment. But satisfactory functional improvement depends on splinting and rest during acute neuritis stage followed by dedicated physiotherapy. Similarly foot wear modification tailor made to satisfy the requirement of individual patient with education regarding care of anaesthetic hand and foot can go a long way in preventing trophic changes due to leprosy.

All these highlights the need to put up multispecialty clinics which render services of Dermatologist, Rehabilitation specialist, Orthopedician, Surgeon and Counsellor under one roof to meet the challenges of post elimination era.

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