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Trends And Types of Multiple Deformities in Leprosy: A Retrospective Study

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Abstract: *In this retrospective cohort study, all new leprosy patients diagnosed and registered for multidrug therapy (MDT) between year 2013 and 2015 in the Department of Skin & VD, Government Medical College Akola in the state of Maharashtra were included. The main objective of the study was to determine trends and types of multiple deformities before, during and after MDT. Out of total 141 patients with grade 2 deformities (G2D), 35(25%) patients had multiple deformities either involving hands, and feet and or face or combination of all these three. These include blindness, facial disfigurement, loss of fingers and or toes and chronic wounds due to an inability to feel pain and pressure. These physical features lead to difficulties in performing activities of daily life such as fastening buttons, writing, picking up objects, and walking.*
Keywords: *Deformity Leprosy, MDT,*

I. Introduction

Leprosy is an important cause of preventable disability. Physical impairment associated with leprosy is usually secondary to nerve damage resulting from chronic grannulomatous inflammation due to Mycobacterium leprae. Impairment may give rise to disabilities such as limitation of activities involving the use of hands, feet and eyes, and restriction 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 care to limit further secondary damage. Deformities are the most striking manifestations of leprosy. Deformities seen in leprosy affected persons range from a mild degree of anaesthesia on hands and or feet to a very severe degree such as resorption of fingers and toes, clawing, trophic ulcers, wrist drop, foot drop and involvement of eyes rendering them useless for walking and loss of vision[1]. Most of the leprosy patients do not have disability and or deformity when the disease first appears but develops them later. Most of the deformities are mild and reversible to begin with and becomes severe and permanent later on. Involvement of more than one body part such as hands, feet or eyes may be considered as more severe than involvement of only one body part as it incapacitates the affected persons greatly. Multiple deformities not only result in biomedical but also psychosocial and financial consequences which also extend beyond affected persons to influence their families, society and country as well. Also, reconstructive surgeries require for maximum possible correction, their social and financial rehabilitation further adds economic burden to the country. In 2009, WHO launched the Enhanced Global Strategy for further reducing the disease burden due to leprosy for 2011-2015; under which the target was to reduce numbers of new cases of leprosy with Grade 2 deformity (G2D) per 10000 populations by at least 35% between the end of 2010 and the end of 2015 instead of leprosy prevalence [2]. Disease prevalence, defined as the number of patients diagnosed with leprosy and registered for MDT over the course of a year, is very sensitive to factors such as treatment duration and case-finding method. G2D has been proposed as an indicator instead of leprosy prevalence because it is less susceptible to operational factors such as detection delay and is a more robust marker for mapping cases of leprosy in a country. WHO expects that by using G2D as an indicator and by focusing interventions on reducing G2D, delayed detection and treatment of leprosy patients will also be reduced and so will the number of new leprosy cases in the population. So, searching for these groups of patient is of utmost importance. There are very few studies on trends and types of multiple deformities. The purpose of this study was to determine the magnitude of multiple deformities involving more than one body parts in leprosy patients. Also, in recent years under leprosy control programme most attention has been given to prevention of disability.

II. Materials and Methods

otal 141 patients diagnosed and registered for MDT who developed grade 2 deformities before, during or after MDT in the Department of Skin & VD in a tertiary care Institute at Akola of Maharashtra state for the period between 2013 and 2015 were analysed retrospectively. Among these 141 patients, those who had three or more types of deformities involving more than one body part were included in the study with the objective to determine trends and type of multiple deformities. These patients were classified according to the consensus

classification of the Indian Association of Leprologist (IAL) [3] and deformities as per WHO grading of deformity [4]. Clinical typing, MDT treatment, treatment of neuritis and lepra reactions and deformity status based on records of urban leprosy unit were compiled and tabulated.

2.1 WHO grading system of deformity

2.1.1Hands 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

2.1.2 Eyes

Grade 0: No eye problem due to leprosy; no evidence of visual loss
Grade 1: Eye problem due to leprosy present, but vision not severely affected as a result (vision: 6/60 or better; can count fingers at 6 meters)
Grade 2: Severe visual impairment (vision worse than 6/60; inability to count fingers at 6 meters); also includes lagophthalmos, iridocyclitis and corneal opacities

III. Observations and Results

Out of total 600 patients registered for MDT during year 2013 to year 2015, 141 subjects developed G2D deformities either before; during or after MDT and the overall deformity rate was 23.5%. Among these 141 subjects, 35 (25%) had multiple types of deformities involving more than one body part. These 35 subjects included 28 males and 7 females with M: F ration of 4:1 showing male preponderance (TABLE 1).

The youngest patient was 15 years old and the oldest patient being 78 years of age. The maximum deformities were seen in the age group of more than 50 years of age 54% (19 out of 35) followed by 7 (20%) in the age group between 30-39 years, and 6 (17%) in the age group between 20 to 29 years (TABLE 2).

Among these 35 subjects, 13 (37%) patients had deformities at the time of presentation while 10 (29%) developed deformities during MDT and 12 (34%) developed deformities after release from treatment (RFT) (TABLE 3).

Out of 35 subjects, 28 (80%) patients had hands and feet involvement. Six percent patients had hands and eyes and feet and eyes involvement. Three (8%) subjects had involvement of hands, feet and eyes. Most common presentation was combination of clawing with trophic ulcers observed in 15 (43%) of subjects followed by clawing, trophic ulcers & resorption of fingers or toes in 8 (23%). Foot drop and lagophthalmos with other deformities were observed in 6 (17%) and 3 (8.5%) patients respectively (TABLE 6).

IV. Discussion

Even with successful treatment, the leprosy patient is frequently left with various disabilities and deformities which lead to serious psycho-social and financial impact. Determination of the rate of deformities and disabilities before and after treatment is a good measure to assess the efficacy of leprosy treatment control programs. The second report of the WHO expert committee on leprosy estimated that the risk of impairment occurring in leprosy patient was 25% [5]. In some studies the prevalence rates of disability in leprosy were between 16% and 62% [6.7.8]. Involvement of more than one body part such as hands, feet or eyes may be considered more severe than involvement of only one body part. The purpose of this study was to determine the trends of body parts involvement and types of multiple deformities.

In the present study the deformities resulting in disability were observed in 141 cases out of 600 making overall deformity and disability rate 23.5% which is in the range of deformities found in the various studies conducted in different regions of India [6, 7, and 8]. Among these 141 subjects, 35 (25%) had multiple types of deformities involving more than one body parts. These 35 subjects included 28 males and 7 females showing male preponderance. This male preponderance may be because more exposure of males to hard work as compared to females. Also, prevalence of leprosy is not only lower in women but women more often suffer from benign form like non-lepromatous type of leprosy[9].

The youngest patient was 15 years old and the oldest patient being 78 years of age. The maximum deformities were seen in the age group of more than 50 years of age 54% (19 out of 35) followed by 7 (20%) in the age group between 30-39 years, and 6 (17%) in the age group between 20 to 29 years. The reason for more prevalence of deformities in subjects more than 50 years of age may be ignorance of the disease by themselves as well as by family members. Deformities in young and adults (37%) can be because of their maximum outdoor working for livelihood. Heavy manual labour and specific occupation causing repeated trauma to an anaesthetic parts are likely to lead to ulceration, tissue damage and even mutilation. The more prevalence of deformities in young and adults might hinder the working capacity of these individuals who are economic backbone of family, society and the nation.

It is said that MDT has reduced the rate of deformities in leprosy but in our study more deformities 10 (29%) were observed in those who were on MDT whereas 12 (34%) developed deformity after released from treatment. Twelve patients (34%) had deformities at the time of presentation. The reason for development of deformities during MDT may be either ignorance or incomplete treatment of the lepra reactions and neuritis.

In the present study, 28 (80%) patients had hands and feet involvement making them crippling and unable to do their daily routine and to work. Most common presentation was combination of clawing with trophic ulcers observed in 15 (34%) of subjects followed by clawing & resorption of fingers or toes (Fig 1& 2) in 8 (23%). Six patients (17%) had food drop and 3 (8.5%) had lagophthalmos (Fig 2) apart from other deformities. Many studies conducted in different regions of India also found that hands and feet were the most common sites involved and either claw hand or trophic ulcer was the commonest presentation of deformities as observed in our study [6, 7, and 8].

People with deformity may lose their employment because of functional disabilities associated with leprosy and or because of negative attitude of employers and the community. This has a major impact on people's economic ability to support themselves and their families. Socioeconomic rehabilitation (SER) such as income generation projects and vocational training may enable leprosy affected people to find productive employment, contribute to the economy of their family and live with dignity. The important objectives of the Enhanced Global Strategy are: (1) to strengthen routine and referral services within the integrated health systems in all endemic countries; (2) to implement innovative approaches for case-finding to reduce delayed diagnoses and G2D among newly diagnosed leprosy cases; (3) to improve the quality of clinical services for the diagnosis and management of acute and chronic complications and for prevention of disabilities or impairments, and to enhance rehabilitation services through a well organised referral system; (4) to support all initiatives to promote community-based rehabilitation and especially to reduce stigma and discrimination against leprosy patients and their families; and (5) to explore the use of chemoprophylaxis to prevent new leprosy cases among household contacts.

Though the disease of leprosy comes to the stage of eradication, the persistent deformities in these patients remains a major health problem. Cured patients with permanent sensory deficit need constant care of the hands and feet. Neuropathic changes also need continuous and lifetime care. Early and timely diagnosis of leprosy, starting MDT and proper preventive measures can facilitate to reach WHO's Enhanced Global Strategy target to reduce the number of new leprosy cases with G2D.

TABLES

Table1. Sex ration of deformities

Sr No.	Sex	No.	Percentage
1	Male	28	80%
2	Female	7	20%
3	Total	35	

Table2. Deformities in different age groups

Sr No.	Age group (in years)	No. Of deformities		Total	Percentage
		Male	Female		
1	10-19	1	0	1	2.8%
2	20-29	1	1	2	5.7%
3	30-39	7	0	7	20%
4	40-49	5	1	6	17%
5	>50	14	5	19	54%
6	Total	28	7	35	100%

Table3. MDT status at the time of development of deformity

Sr No.	MDT status	No of patients	Percentage
1	New	13	37%
2	On MDT	10	29%
3	RFT	12	34%
4	Total	35	100%

Table 4. Sites of involvement of deformity

Sr No.	Site of involvement	No. Of patients	Percentage
1	Hands and Feet	28	80%
2	Hands and Eyes	2	6%
3	Feet and Eyes	2	6%
4	Hands, Feet and Eyes	3	8%
5	Total	35	100%

Table 5. Types of deformities

Sr No.	Combination of deformity	No. Of patients	Percentage
1	C and TU	15	43%
2	C and TU and R	8	23%
3	C and TU and FD	6	17%
4	C and TU and L	3	8.5%
5	FD and TU and L	3	8.5%
6	Total	35	100%

FIGURES

Figure 1. Resorption of ~~hands~~ fingers

Figure 2. Resorption of toes

Figure 3. Lagophthalmos

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