

Is increasing MB ratio a positive indicator of declining leprosy?

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ABSTRACT

In recent years, an increasing MB ratio-trend has been seen in most state reported leprosy data in India and elsewhere. The programme of leprosy all over the world has been integrated with general health system (GHS). This has given rise to gross under reporting of leprosy cases and increasing MB ratio. This paper examines this critical issue and attempt to find out the causes of this trend.

The findings suggest clearly that increasing MB ratio is the result of early cases of leprosy being missed out. This can be to the extent of 73% when MB ratio is reached to 47.5%.

INTRODUCTION

The world wide application of MDT has cured millions of leprosy patients. In India a country with largest case load, MDT has brought down the prevalence of disease from 10.9 in 1994 to less than 1 (0.9) per 10,000 population in December 2005. The elimination of disease has been achieved at national and the state level in many states^{1,2}. The decreased case load has led to the gradual integration of leprosy services with general health care system with patients of leprosy being treated like any other disease for the last 2-5 years³.

Following integration, the emphasis of

leprosy work involving active case detection has been given up and replaced by voluntary reporting. A steeper decline⁴ in reported cases during the last few years may have contributed to the elimination targets.

While the issues like the integration of leprosy services in particular its timing, duration and optimal length of therapy required for both PB and MB patients, especially highly positive MB patients, the classification of neuritic cases, weightage to be given to number of thickened nerves in classification and hence the treatment regimens, continue to be debated, the epidemiological and

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assessment parameters have remained almost the same. Whereas prevalence rate (PR) has been the main index⁵, in the recent years, the workers are beginning to talk about new case detection rate (NCDR) and have begun to realize that this may be more important. Of the other parameters childhood rate and MB ratio have also been measured as an index of leprosy infection in the community.

PR has shown steep declining trends⁴, and so have some reduction in NCDR, childhood and deformity rates. In contrast, a gradual and of late a sharper rise in MB ratio has been reported from several states. The increase in MB ratio too, has been taken to indicate decreasing leprosy in the community by the field workers and planner. How this parameter reflects the disease status in the community and what does it indicate are some of the issues that this paper examines.

PUBLISHED DATA

Based on data provided by the states, it is seen from **Table 1**, that till about a decade ago (1992-1996), the overall MB ratio (classified on the basis of number of skin lesions) was in the range of 8.5% to 25.1%. In contrast the recent data shows that this ratio has gone up. At the national level, MB ratio has increased from 25.9% in 1994 to 45.2% in 2005¹. Data from Uttar Pradesh shows that while the MB ratio was 19.7% in 1991, increased to 35.5% in 1997 and 45.8% in 2005. Here childhood rate has also increased from 4.7% in 1992 to 10.4% by 2001 and thereafter has shown a decline to 7.5%².

Table 1. MB Ratio in leprosy- Published data

Ref. No.	State	Year(s)	Percent MB leprosy
6	A. P.	1992-1994	16-21
7	Chattisgarh	1987-91 1992-96 1997-2001	15.3 25.1 28.7
2	Uttar Pradesh	1991-1993 1993-1997 1997-2005	19.7-26.0 33.2-35.5 41.3-45.8
8	Tamilnadu	1992-1998 1999-200	8.3-13.9 217.9-26.9
9	Orissa	1998	24.4
10	Bombay	1998	13.0
11	Agra	1999-2002	30.9
12	Agra district	2001-2003	17.0
13	Bangla Desh	2002	16.7
14	Nigeria	1998	26.0

MB RATIO BEFORE AND AFTER INTEGRATION

When one looks at it closely, it is found that over the years, especially after the LEC and/or integration active case detection has been replaced by voluntary reporting. It appears that following this change, a steep increase in MB ratio has been forthcoming. Report from Andhra Pradesh is relevant in this connection⁶. It is seen from the state figures that MB ratio which was 15.8% before integration in AP, increased to 33.7% within 2 years (1992-94) of leprosy services being integrated with GHC system.

The possible reasons for this could be; a) in contrast to active search wherein cases are deleted early (when they have limited

disease), voluntary reporting to health facility occurs late when the disease is relatively advanced and begins to bother individuals unless he is well informed and knowledgeable about the disease. This is more likely to be so in poorer communities where basic needs of life are still to be met. This is borne by observations that clinics and hospitals where patients self report a larger proportion of MB patients than PB cases are seen (30% at JALMA in 2001 vs. 17.6% in 2005) in active search (unpublished data).

The data from Tamil Nadu clearly shows not only is the delayed reporting, many patients do not come for treatment and thus the proportion of voluntarily reported cases dropped to 42.5% following integration. Even 5 years later, voluntary reporting increased only to 78.3% indicating that more than 20% leprosy patients do not self report to health facility⁸. The reason for this may be that the disease being asymptomatic in early stages does not bother them and thus they do not feel the need to report despite the known fact of high awareness in the region. This may thus be the cause for lower proportion of PB disease among self reporting patients.

b) Following integration, it is possible that early cases are not being confirmed or diagnosed resulting in the decline of total registered case load with consequent increasing ratio of MB cases. Since leprosy work has suddenly been shifted from trained, experienced workers of vertical programme to PHC

personal whose understanding of leprosy and diagnostic skills may not be as good. This could well have been the reason for sudden decline in PR observed since 1997 and thus sharper decline in PR from 10.9 in 1994 to less than 1 (0.9) per 10,000 population in December 2005¹.

c) It has been reasonably suggested that increasing MB ratio should lead to higher childhood rate as the load of transmission in the community is likely to be higher and hence more children are likely to get infected early in life as reported from Chattisgarh⁶. On the contrary, national figures and data from several states indicate a shift to right with decreasing disease among children. Does this indicate that early cases, which are more often seen in children, are being missed for want of continued active search?

d) Increasing MB ratio, as detailed above, indicates delay in diagnosis. Thus if, the MB ratio is high, one does expect higher deformity rates (DR) too, which is not seen in the reported data. There has been a substantial decline in DR during last several years. Is this any reflection on the quality of data being generated?

e) Last but not the least, over zealous attempt to achieve elimination of leprosy at all levels and pressure to eliminate disease by stipulated date could have resulted in non-registering of early leprosy (single/few lesions) patients- resulting in same effect. This experience was voiced by several members at the last meeting of IAL (Agra-2005). This seems to have been happening atleast in some areas.

DELAY IN PRESENTATIONS

Above findings suggest that while leprosy scenario is improving, increasing MB ratio reflects the delay in presentation (and thus detection and diagnosis) of leprosy. Indeed this is borne by the findings that during active surveys in the community not only large of hidden cases are diagnosed but also larger number of one to few skin lesion (early PB) cases got detected and MB ratio decreases. This has been seen in LEC undertaken in several states in India and else where. In contrast, proportion of MB patients, self reporting to clinics and referral hospitals is high and reporting to the clinics is late. Our own field data in 2005 (unpublished), indicates that duration of illness of SSL cases is around 14.8(\pm 0.9) months whereas PB patients with 2-5 lesions could be put on treatment as diagnosed after 25.5 (\pm 1.3) months of disease. In contrast a delay of 36.9 (\pm 2.1) months in diagnosing occurred in MB cases. Thus, if cases are not diagnosed through voluntary reporting or detected within 24 months, larger number of MB patients are bound to be reported in peripheral leprosy hospitals.

MB RATIO IN INCIDENT LEPROSY

While studying incidence rate, a low MB ratio of 10.4% in Agra¹⁵ and 13.1% in Chandigarh¹⁶ respectively has been observed, suggesting active search, where in a large majority of cases are detected and diagnosed, brings out early cases had there been no active search and these patients might not self report till the disease became advanced i.e. MB and

hence may result in high MB ratio.

It thus appears that over all there is a significant under self-reporting of early cases with consequent high MB ratio. This suggests that more and more PB cases are remaining undiagnosed and untreated in the community. Indeed our findings from Agra district reveal that more than 90% of the total cases detected in active surveys during 2005 were untreated- thus their increased likelihood of progressing to MB state had they not been detected some thing which is detrimental to the interest of leprosy control programme in long run.

DURATION OF DELAY AND MB RATIO IN FIELD SURVEYS

Since leprosy disease as such does not cause any problem (symptoms) in the early stage, patients quite often report late at health facility due to various other priorities and needs. The data from Agra suggests that about 35% leprosy patients detected during 1999-2004 in active surveys, had disease duration reported as <12 months, 21.6% as 13-24 months, 18% as 25-48 months and 25.2% as beyond 48 months. During 2005, rapid survey (under progress) of the whole population, 54% patients detected had reported disease duration of less than 12 months, 21.4% as 13-24 months, 16% as 25-48 months and only 8.5% as beyond 48 months. The MB ratio has declined from 26.8% in 1999-2004 to 17.6% in 2005 (**Panel A, Table 2**). The data indicates that repeat surveys have two advantages; one, it helps detect new cases including detection of missed cases in earlier

Table 2. Duration of delay in treatment among cases detected in Agra Leprosy Project (ALP)

A. Duration of delay (months)	1999-2004			2005		
	Cases	%	%MB	Cases	%	%MB
<6	150	17.2	11.3	254	28.5	3.5
7-12	155	17.8	18.1	227	25.5	11.0
13-24	189	21.6	27.0	191	21.4	22.5
25-36	105	12.0	33.3	93	10.4	34.4
37-48	54	6.2	37.0	50	5.6	48.0
>48	220	25.2	37.7	76	8.5	31.6
Total	873	100.0	26.8	891	100.0	17.6

B. Skin Patches Distribution and MB ratio				
Patches	1999-2004		2005	
	Dist'n	%MB	Dist'n	%MB
0-1	54.1	10.8	51.5	2.4
2	15.3	3.7	17.3	1.3
3	7.2	9.5	8.5	2.6
4	2.8	8.3	4.6	2.4
5	2.2	47.4	2.5	13.6
5-10	6.1	100.0	5.5	100.0
>10	12.4	100.0	10.1	100.0

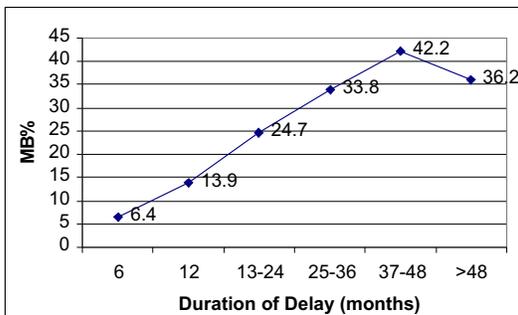


Fig. 1. MB% by duration of delay in ALP, 1999-2005

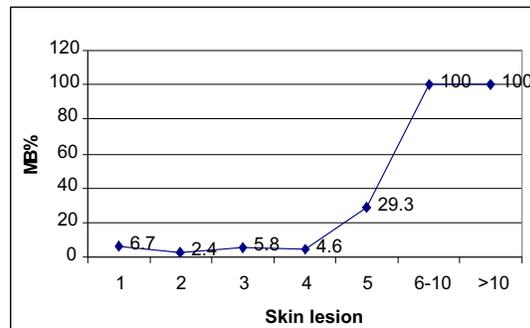


Fig. 2. MB% by skin lesions in ALP, 1999-2005

surveys and secondly, it also reduces the delay in detection and thus patients get the disease treated relatively early. This is

evident from the data (Panel B, Table 2). However, such a observation among self reporting cases is not there, suggesting

that patients with early disease do not approach the health centers for treatment. In absence of actual figures, simulation models have been used to understand the dynamics of late reporting leprosy and also the related pattern of change in MB ratio. However it is not known as to what proportion of leprosy cases are reporting late or not reporting. However, continued appearance of new cases and their seeking treatment, gives some indication for such a trend. Therefore, an attempt has been made to assume to understand the possible scenario of (under or late) reporting under hypothetical situations.

SIMULATING THE PHENOMENON OF LATE REPORTING

Following integration scenario, let us

assume a situation (S1) in which 'No PB leprosy patient with duration of upto 6 months reports at health center and only 10% of MB patient of this duration are seen. We also assume that all the cases with duration of >6 months come to health posts for treatment (may not be a reality). This situation (S1) would give rise to about 5% point increase (22.2% to 27.1%) in MB ratio but about 22.7% of the total leprosy cases would be missed out from voluntarily reporting from treatment. In second situation (S2), if no case with upto 6 months of disease is reported but 10% of PB patients and 20% of MB patients are reported with disease duration of 7-12 months and 100% with longer disease duration, then the MB ratio would increase by about 10% points

Table 3 : Increase in MB ratio and % Missed cases-Results of simulation (Si)

DOD	PB	MB	S1	S2	S3	S4	S5	S6
≤6	378	26	0*PB+ 10%MB#	Nil	Nil	Nil	Nil	Nil
7-12	329	53	100%	10%PB+ 20%MB	Nil	Nil	Nil	Nil
13-24	286	94	100%	100%	20%PB+ 30%MB	Nil	Nil	Nil
25-36	131	67	100%	100%	100%	30%PB+ 60%MB	Nil	Nil
37-48	60	44	100%	100%	100%	100%	40%PB+ 90%MB	Nil
>48	189	107	100%	100%	100%	100%	100%	50%PB+ 100%MB
MB(%) Ratio		22.2	27.1	31.9	35.2	37.6	39.6	47.5
%missed cases	Assumed Zero		22.7	41.9	58.6	65.4	67.6	73.0
Hike in MB (%) Ratio		100	122	144	159	169	178	214

indicates cell values are percentage of cases of respective duration reporting for treatment

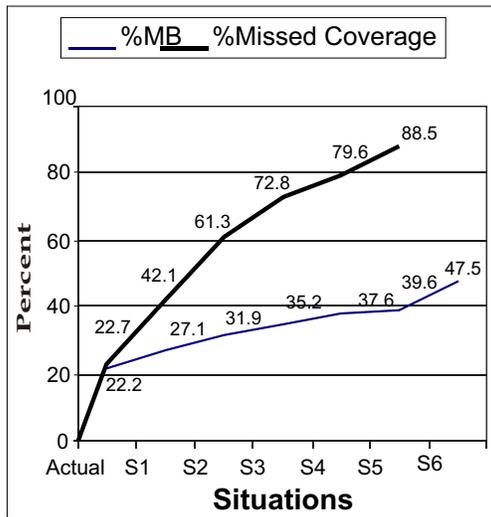


Fig. 3 %MB and % Missed Cases

(22.2% vs. 31.9%) and also resulting in 41.9% of leprosy cases missed out. Similarly, if no case with duration upto 12 months is reported but 20% of PB and 30% MB patients reported with disease duration of 13-24 months for treatment (S3) and 100% of them with longer duration of untreated disease, the MB ratio would increase by 13% points (22.2% vs. 35.2%) and 58.6% cases getting missed out. In situation (S4), MB ratio would touch 37.6% and 65.4% cases not being reported. Similarly, it goes on to situation (S6) that suggests that MB ratio would touch 47.5% and 73% of the total cases would be missed out if none of case with disease duration of upto 4 years is reported and only 50% PB and 100% MB cases with disease duration of over 48 months are reported (Table 3). The overall situation as shown (Fig.3), suggest a clear and substantial rise in MB ratio and percent cases missing out under situation 1 to situation 6.

DISCUSSION

To achieve the goal of elimination within the set period, it seems that a compromise has been and continues to be made. This involves apparently missing of early leprosy cases and what seems to be happening is late voluntary reporting till the disease has progressed to MB state resulting in gradually increasing MB ratio. This seems to have happened with integration. As voluntary reporting is totally based on increased awareness using IEC activities about disease, it appears that there is an urgent need to analyze the effectiveness of health education (IEC) activities, utilization of health infrastructure and efforts, motivation and the interest taken by the field staff in leprosy work.

This may give us insights not only with regard to the rising MB ratio and the true picture of case detection as also the utility of other parameters which are now based on self reporting of patients to the health personals and/or facility in contrast to earlier active search in the community.

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