Patient characteristics & treatment outcome in active and passive case finding of leprosy A retrospective cohort study in the province of Niassa, Mozambique

by

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Abstract

Leprosy is a common problem in northern Mozambique with an estimated prevalence of 8.7/10,000 in 1999. During a Leprosy Elimination Campaign (LEC) the case detection rate rises as a consequence of active case finding. In the province of Niassa a LEC was organised in 9 out of 16 districts during the second trimester of 1999. Comparison of patient characteristics of 1999 LEC patients with those of a group of self-reporting patients from the second trimester of 1998 shows that LEC patients have a lower risk to abandon treatment than self-reporting patients. A thorough phase of information and propaganda raises people's awareness of the risks of leaving leprosy untreated and of medication being available for free. Also a lower risk to abandon treatment is found for female leprosy patients compared to their male counterparts. This result has been found in previous research and can be explained by the

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fact that women in developing countries tend to have a more subordinate position than men. They are therefore more prone to listen to the orders from the medical staff.

Multi Drug Treatment (MDT) clinics should develop a system for determining the disability grade of leprosy patients once they have finished their treatments. These disability grades after treatment may give important information on when active and passive case finding will be compared in the future. More research is needed to find out if LEC activities lead to less severe disabilities because of better awareness and early detection of patients.

Introduction

Leprosy is a common disease in the northern part of Mozambique. In 1999, 74% of all leprosy patients lived in this region, which accounts only for 31% of the total population of Mozambique (1). It is obvious special attention should be given to this area. In 1991, the leprosy control programme joined the tuberculosis control programme to form the National Tuberculosis and Leprosy Control Programme (NTLCP). The NTLCP is part of the Department of Epidemiology and Endemic Diseases of the Ministry of Health. This programme is basically vertically organised within the health care system with some integration at district level in the general health services.

The provinces of Nampula, Cabo Delgado and Niassa form the northern region of Mozambique where the leprosy prevalence was as high as 8.7/10,000 in 1999 (1). To detect hidden leprosy cases a Leprosy Elimination Campaign (LEC) was carried out in 1999. Special teams visited the remote areas in the northern region to educate people and at the same time screen the population for leprosy. This active method is used in various countries and has very positive results regarding case detection rates (2-8).

Available literature about comparisons between active and passive case finding (self-reporting patients) is limited. Tiendrebéogo and colleagues (9) only cover detection rates and costs of Leprosy Elimination Campaigns, but do not consider the treatment outcome or patient characteristics. Ebenso (10) studied the effect of LEC on treatment outcome.

For future planning of LECs and for strengthening case holding activities, it is useful to determine completion rates for cases detected during LECs and compare the results with those patients diagnosed in a "routine" programme. The objective of this study is to compare entrance

characteristics and results of treatment in passively (self-reporting) and actively diagnosed patients during a LEC held in 1999. This is a preliminary report on the situation in the province of Niassa, because until Summer 2001 only data from this province were complete and ready for analysis.

Methods

Due to high prevalence of leprosy in the northern region of Mozambique a World Health Organisation (WHO) sponsored LEC was carried out in the second trimester of 1999 from 7 April until 30 June. The LEC was carried out in the following phases: 1) preparation phase (contacting local governments), 2) information and propaganda phase and 3) active case finding phase. Information was disseminated using radio (Portuguese and local language), megaphones on cars (local language) and pamphlets. Information was given on the beginning characteristics of leprosy and the possibility of free examination and treatment in case of leprosy diagnosis. Two well-trained nurses with longstanding working experience together with the national supervisor for leprosy formed the LEC team. The provincial supervisor of Niassa and the programme manager of each district that was visited always accompanied the LEC team and collaborated with them. At specific LEC dates this team would come back to the district to examine the gathered population to diagnose leprosy patients and start MDT treatment. During directly observed treatment (DOT) patients were given further health education on the importance of regular and complete treatment.

The professional training level of the health workers involved, can be divided in three groups:

- Nurses with a three year professional medical training. They work full-time and administer the drugs and give health information to the patients. They are the only group of health workers who are qualified to examine the patients.
- Volunteers, "Agente Polyvalente Elementar" (APE) with six months of medical training. They work full-time and are also qualified to give health information to the patients.
- Volunteers, who took a seven day introductory course on leprosy given by the leprosy team. Their role is to help nurses and APEs.

Our study focussed on three different groups of leprosy patients. Leprosy patients who reported themselves at the Multi Drug Treatment (MDT) clinics in the second trimester of 1998 formed the first group. In

three districts of Niassa (Metarica, Nipepe and Marrupa) a mini-LEC was held in 1998, which provided extra information for leprosy patients. Secondly we collected data from the second trimester of 1999 and made a distinction between two groups of patients: self-reporting patients and LEC patients. The group of self-reporting patients consisted of those patients who reported themselves at the MDT clinics during the second trimesters of 1998 and 1999 without the benefit of education during the LEC activities. The self-reporting patients were divided between those of 1998 and those of 1999 because of possible effects of the LEC in 1999. The LEC patients of 1999 where those patients who were detected during the LEC activities in the second trimester of 1999. The LEC was performed in the same trimester in which the self-reporting patients were identified in 1999.

In 1998 the Niassa province had a population of 856,000 people of whom 75% lived in rural areas. The drug delivery system did not change after the LEC was over. Since 1996 MDT coverage in Niassa is 100% and during the LEC 12 new MDT clinics opened their doors, making a total of 84 MDT clinics in this province (11).

The leprosy prevalence in the province of Niassa was estimated at 4.3/10,000, which is higher than the WHO goal of <1 patient per 10,000 inhabitants. Nine high leprosy prevalence districts (out of 16) were selected in Niassa for the LEC activities of 1999. These districts had 135,154 inhabitants of whom 5681 people (4.2%) were examined by the LEC team at special LEC dates. The LEC team had a specialist supervisor, meaning that as soon as leprosy was confirmed by the LEC team, patients were classified and given MDT accordingly.

The following data were collected from the clinical cards, district register books and health unit treatment registers:

- Sex (male or female)
- Age (0-15 yr, 16-30 yr, 31-50 yr, 51-99 yr)
- Type of leprosy (multibacillary or paucibacillary)
- Patient type on entrance (new case, retreatment, relapse, transferred)
- Disability grade before and after treatment (Eye-Hand-Feet score between 0 and 12) recoded in "no disabilities" and "one or more disabilities"
- Treatment outcome (treatment completed, defaulter, died), recoded in "Treatment completed" and "Defaulter" (2 patients who had died were recoded as missing values)
- District and health unit where patient was treated

- Start-up year of health unit
- Training level of health worker, categorised as "nurse" and "volunteer"

Age was divided into four categories because many people did not know their exact birth date. To assess disability grades we used the total score (0 to 12) of the WHO three-grade (0, 1 or 2) system of classification of each hand, foot and eye (12-15).

All collected data were compared to the district and provincial reports to verify their accuracy.

Data were analysed by using the Statistical Package for the Social Sciences (SPSS), version 10. Simple and multivariate logistic regression analyses were performed to assess relations between treatment outcome as the dependent ("treatment completed" and "defaulter") and sex, type of group ("self-reporting 1998", "self-reporting 1999" and "LEC 1999") as independent variables. The multiple regression analysis was adjusted for age, type of leprosy, type of patient, disability grade before treatment (classes) and training level of health workers (classes).

Results

Data acquisition was consistent (with one exception) with district and provincial report numbers and with the data the LEC-team recorded. The district of Nipepe missed one multibacillary patient. Records of a total of 197 patients were collected. During the second trimester of 1998 61 patients were self-reporting. In the second trimester of 1999, 37 patients were listed as self-reporting (passive) patients and 99 patients were registered during LEC activities. Data were complete except for the disability grade after treatment, where 45% of the patients during these two trimesters were not examined after finishing their treatment.

The case detection rate doubled in most districts in 1999 as compared to the year before. In the districts of Metarica, Maúa, Nipepe and Marrupa the case detection rate more than doubled as can be seen in figure 1.

In 1998 59% of the patients were female, whereas in 1999 this percentage dropped to 41% for the self-reporting patients and was almost equal for the LEC patients (57%).

Most patients (43%) were middle-aged and 15% were children below the age of 16. Most patients were new cases and finished their treatments in the required period of time. Table 1 gives an overview of patient characteristics.
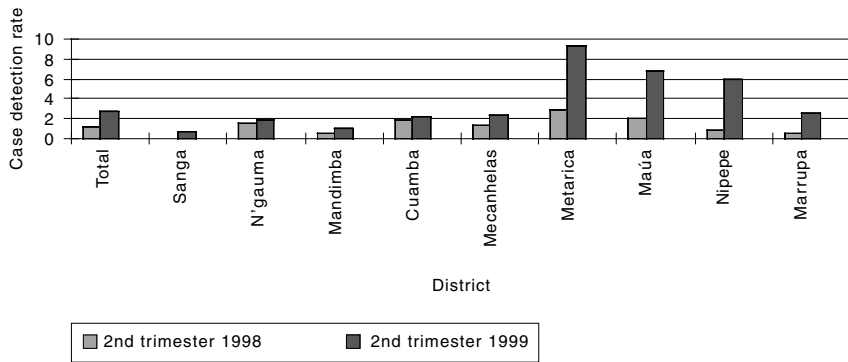
Fig. 1: Total case detection rate (per 10,000) in Niassa.

TABLE 1
Patient characteristics in Niassa (N = 197)

Variable		Self-reporting patients 1998 (N = 61)	Self-reporting patients 1999 (N = 37)	LEC patients 1999 (N = 99)
Sex	Male	25 (41%)	22 (59%)	42 (43%)
	Female	36 (59%)	15 (41%)	56 (57%)
Age	0-15	9 (15%)	4 (11%)	19 (19%)
	16-30	14 (23%)	11 (31%)	23 (23%)
	31-50	26 (43%)	17 (47%)	41 (41%)
	51-99	12 (20%)	4 (11%)	16 (16%)
Type of leprosy	MB	39 (64%)	28 (76%)	58 (59%)
	PB	22 (36%)	9 (24%)	41 (41%)
Type of patient	New patient	59 (98%)	37 (100%)	93 (94%)
	Retreatment	1 (2%)	–	4 (4%)
	Relapse	–	–	2 (2%)
Treatment outcome	Treatment completed	52 (85%)	35 (95%)	94 (97%)
	Defaulter Died	9 (15%)	2 (5%)	3 (3%)
Disability grade before treatment	0 deformities	26 (43%)	24 (64%)	66 (67%)
	≥1 deformities	35 (57%)	13 (35%)	33 (33%)
Disability grade after treatment*	0 deformities	20 (87%)	20 (71%)	48 (84%)
	≥1 deformities	3 (13%)	8 (29%)	9 (16%)
Educational level of health worker	Nurse	37 (62%)	21 (60%)	31 (31%)
	Volunteer	23 (38%)	14 (40%)	68 (69%)

*   Disability after treatment missed 38 (62%) self-reporting patients 1998, 9 (24%) self-reporting patients in 1999 and 42 (42%) of LEC patients in 1999.

TABLE 2

Simple and multivariate logistic regression analysis for treatment outcome (N = 197)

Independent variable	Crude Odds ratio	95% CI	Adjusted Odds Ratio[*1]	95% CI
Sex (Female vs. male)	0.44	0.14-1.35	0.31	0.08-1.18
Type of group (Self-reporting 98 vs. LEC99)	5.42	1.41-20.91	8.09	1.57-41.82
Type of group (Self-reporting 99 vs. LEC99)	1.79	0.29-11.17	2.23	0.29-17.33
Disability grade before treatment (0 disabilities vs. ≥1 disabilities)	1.11	0.37-3.33	1.06	0.29-3.83
Type of Leprosy (MB vs. PB)	1.34	0.45-4.02	1.57	0.42-5.83
Training level of health worker (Nurse vs. volunteer)	0.63	0.21-1.88	0.68	0.19-2.44

* [1] In this multiple regression analysis the following variables were used as independent variables: sex, type of group, age, type of leprosy, type of patient, disability grade before treatment and training level of health worker.

TABLE 3

Simple and multivariate logistic regression analysis for treatment outcome
(using data from 1998 and LEC 1999) (N = 160)

Independent variable	Crude Odds ratio	95% CI	Adjusted Odds Ratio[*1]	95% CI
Sex (female vs. male)	0.33	0.10-1.16	0.18	0.04-0.86
Type of group (self-reporting 98 vs. LEC99)	5.42	1.41-20.91	7.12	1.48-34.20
Disability grade before treatment (0 disabilities vs. ≥1 disabilities)	1.43	0.44-4.66	1.92	0.44-8.42
Type of Leprosy (MB vs. PB)	1.61	0.49-5.23	2.56	0.58-11.41
Training level of health worker (nurse vs. volunteer)	0.74	0.23-2.40	0.93	0.22-3.91

* [1] In this multiple regression analysis the following variables were used as independent variables: sex, type of group, age, type of leprosy, type of patient, disability grade before treatment and training level of health worker.

Multivariate regression analysis shows a significant relation between treatment outcome and type of group. Self-reporting patients in 1998 have a higher risk to abandon treatment than LEC patients in 1999 (OR 8.09; 95% CI 1.57-41.82). Women tend to have a lower risk to abandon treatment compared to men (OR 0.18; 95% CI 0.04-0.86). An overview of regression analyses can be found in tables 2 and 3.

Discussion

In this study we compared the patient characteristics and treatment outcome of patients detected with active and passive case finding. The group of self-reporting patients of 1999 was not a pure representation of patients without health education. The group of self-reporting patients of 1998 was a better representation, because they did not have any health education as was given during the LEC activities. Therefore we draw conclusions from the comparisons made between the self-reporting patients of 1998 and the LEC patients of 1999. Self-reporting patients detected in the second trimester of 1998 had a significant higher risk to abandon treatment than LEC patients in the second trimester of 1999. The control group of the second trimester of 1999 did not show a significant higher risk as compared to LEC patients of 1999. This suggests that a LEC has a positive effect on the treatment outcome. LEC patients may have benefited from the phase of information and propaganda, which made them aware of the risks of unfinished treatment. One can imagine that people who suffer more disabilities are better motivated to finish treatment, because they already know some of the possible consequences of leaving leprosy untreated. According to Griffiths and Ready (16), patients without an early treatment routine tend to default treatment more often compared to patients with a routine from the beginning of treatment.

Patients who reported themselves in 1999 may have gained some benefit from the activities during the LEC. Awareness programmes were broadcasted on the radio during the four weeks preceding active case finding, which could have resulted in more self-reporting patients in this period. Ebenso (10) pointed out that a positive effect of LEC activities on treatment outcome can be attributed to effective search for follow-up absentees, effective health information and patients' trust in the health system. Furthermore a LEC combines all separate activities a normal programme probably spreads over time, which can account for the success of LEC activities.

Only one disparity was found in the collected data compared with the district and provincial reports. It should be noted that the LEC team examined only 4.2% of the inhabitants of Niassa. Probably only a small

fraction of all hidden leprosy cases in this province was found or patients were more aware of their disease due to a mini-LEC which was conducted in 1998 in few districts of Niassa (Metarica, Nipepe and Marrupa).

The low percentage can partly be explained by the distances people have to travel to reach health clinics in an African rural country. Future LECs or plans for implementing LEC activities in the normal health system should both consider the fact that they possibly miss a large part of the population they want to reach. In Niassa 12 new MDT clinics have opened their doors. This brings the health care system closer to the patients. The organisation of drugs delivery however did not change and people still have to come to the MDT clinic themselves to collect their drugs for the following month.

Entrance characteristics could not be used for logistic regression analysis because almost every patient turned out to be a new case (96%).

Women turned out to have a significantly lower risk to abandon treatment compared to men, when considering the self-reporting patients of 1998 and the LEC patients of 1999. According to several authors (17-20) women in most developing countries are more compliant to treatment. Women might be more willingly to follow medical advises due to their subordinate conditioning. Female leprosy patients encounter different and more social problems than male leprosy patients (21, 22). For example female leprosy patients cannot remarry after their husbands divorce them. Men tend to travel or migrate more often than women and can not visit their health centres regularly due to this mobility. Another possible reason for women to finish their treatment can be that women visit the health centres more often for maternal and child health care.

Those are all possible explanations why female leprosy patients tend to be better motivated to finish their treatment. Why sex distribution varies between the active and the passive patient group in 1999 remains to be explained. Considering all patients of the second trimester in 1999 the ratio between males and females is almost 1:1, which suggests that the male proportion detected in 1999 increased compared to the previous year, when the male to female ratio was 2:3. In Mozambique, due to cultural sex differences both newspaper and radio reach more men than women. Furthermore the illiteracy rate is usually higher for women than for men (17, 21). This can be an explanation why educational activities of the LEC reached more males and brought them to the health clinics for the LEC activities.

Of all patients in the second trimesters of 1998 and 1999, 45% did not have a registered disability grade after treatment. This is regretful but

understandable. After 6 or 12 monthly visits to the MDT clinic it is difficult to convince a patient to come back once more for determination of disability grade without him receiving additional treatment. Some patients have to walk 20 kilometres to reach the MDT clinic. Besides this motivational problem a volunteer is not allowed to determine a disability grade. This has to be done by a nurse which, in the remote areas where volunteers work, forms an organisational obstacle.

To improve the registration of disability grade after treatment, its meaning will have to be explained to patients in the future. An alternative way of collecting these data can be to examine the patient during his or her last visit to the MDT clinic, assuming that disabilities will not change great deal anymore in the last month of treatment. But formally these patients have not yet completed their treatment. Another disadvantage with the disability grade, as we collected it, is that no exact type of disability can be distilled from the data afterwards. Patients can have several combinations of disabilities, but will all appear with the same disability grade in our data collection. Although different authors (13-15, 23) reported the use of the eye-hand-feet-score in recording differences in impairment within patient groups before and after treatment, it might be better to collect both separate grades as well as the sum of these, in order to have a better overview.

Increasing case detection rate is to be expected after active case finding during the LEC activities. Most districts doubled their case detection rate, but it was remarkable that four districts showed an even bigger increase in case detection rate. The four districts that more than doubled their case detection rate (Metarica, Maúa, Nipepe and Marrupa) may have had more hidden cases of leprosy than other districts. These four districts are all part of the South Eastern part of the Niassa province. Perhaps a socio-geographical explanation can be found with further research. But perhaps the mini-LEC in 1998 in Metarica, Nipepe and Marrupa played a significant role in creating more awareness in their population.

It is advisable to develop a system for absentee-tracing of patients with a risk of abandoning treatment. This could be a future role for the volunteers.

Conclusions

Differences in treatment outcome have been found to exist between patients detected during active case finding and patients detected dur-

ing passive case finding in the province of Niassa, Mozambique. Most patient characteristics could not be analysed due to too little spreading of the variables.

LEC activities have proven to have a significant positive effect on treatment outcome. Patients who have had more health education are less at risk to default treatment than self-reporting patients who did not have the opportunity to benefit from the LEC activities. Furthermore, a LEC enables the health workers to identify a larger proportion of hidden cases and start treatment for many people who would otherwise be a source of infection for their community. Last but not least, more MDT clinics were opened during the LEC activities, providing more health care for leprosy patients. Thus, LECs can make an important contribution to eliminating leprosy.

Special attention should be given to male leprosy patients, because they have a higher risk to abandon treatment than women. Cultural and sexual differences between these two groups should be taken into account when offering health education. Health education is an important component of LECs. It is necessary to explain the risks of defaulting and the possibility of developing resistance to medicines when treatment is stopped prematurely. Education could also play a role in lessening the social impact of leprosy.

Furthermore, the National Tuberculosis and Leprosy Control Programme (NTLCP) should develop a system in which each leprosy patient is examined for disabilities when their treatments are finished. The registration forms exist already, but there are not many trained persons who can examine the patients for disabilities. Maybe training the volunteers of the MDT clinics could form a solution. The disability grade after treatment could give more information on treatment outcome and its effects when recorded properly in the future.

To prevent people from defaulting, a control system could be developed in which all patients who abandon treatment could be traced and convinced to finish treatment after all.

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Abstract (NL)

Met een prevalentie van 8,7 per 10000 in 1999 is lepra nog steeds een veel voorkomende ziekte in Noord-Mozambique. Tijdens een Lepra Eliminatie Campagne (LEC) stijgt het aantal opgespoorde patiënten omdat er actief naar gezocht wordt. In de provincie Niassa is in het tweede trimester van 1999 een LEC uitgevoerd in 9 van de 16 districten. Deze LEC-patiënten zijn vergeleken met een groep zelfrapporterende patiënten van het tweede trimester van 1998. Het blijkt dat de LEC-patiënten minder vaak de behandeling voortijdig staken. De intensieve voorlichtingsfase zorgt ervoor dat mensen zich bewust worden van het gratis verstrekken van de medicijnen en van de risico's van het negeren (en dus niet behandelen) van lepra.

Ook blijkt dat vrouwen de behandeling minder vaak staken dan mannen. Dit resultaat is ook al in eerdere onderzoeken gevonden en kan ondermeer worden verklaard doordat vrouwen in ontwikkelingslanden vaak een ondergeschikte rol hebben. Zij zullen adviezen van de medische staf eerder opvolgen.

De Multi Drug Treatment (MDT)-klinieken zouden een systeem moeten hebben om ook nog na afloop van de behandeling de disability-graad te kunnen bepalen. Met deze parameter kan in de toekomst het actief en passief opsporen van patiënten vergeleken worden.

Meer onderzoek is nodig om te kijken of LEC-activiteiten leiden tot detectieverhoging en beter ziektebesef en -inzicht bij leprapatiënten, waardoor zij in de toekomst beperkingen kunnen verminderen of zelfs voorkomen.

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