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ABSTRACT

Objective: **To study the profile of leprosy cases at Nkhotakota District Hospital in Central Region of Malawi.**
Design: **Retrospective cross-sectional study of all registered cases of leprosy from records over a nine year period (January 1992 to April 2001)**
Setting: **Nkhotakota District Hospital-Central Region of Malawi.**
Results: **In total 526 cases of leprosy were identified from the records. The prevalence rates gradually increased from 0.998 per 10,000 cases in 1992 to 3.39 cases per 10,000 in 1995. There was however a gradual decline of prevalence rates from 1997/1998 that had 3.17 cases per 10,000 to 1.3 cases per 10,000 in 2001. 1996 registered 2.34 cases per 10,000. Fifty seven cases (10.8%) were found with children of the age of 14 or below and 469 (89.2%) cases were of adults. Paucibacillary leprosy presented with more cases than multibacillary leprosy ($p<0.0000001$). There were 80 (15.2%) cases of multibacillary leprosy compared to 446 (84.8%) cases of paucibacillary leprosy. In addition more males were affected by multibacillary leprosy than females ($p <0.0001$) and females were more affected by paucibacillary leprosy ($p<0.01$) than males.**
Conclusion: **The results show that paucibacillary leprosy though minor in Malawi can become endemic as paucibacillary leprosy is a reflection of leprosy contacts in the population. We therefore recommend continued epidemiological surveys of leprosy. Training in leprosy detection should be encouraged so that this disease can be totally eradicated in Malawi.**

INTRODUCTION

Leprosy is endemic the world over(1). Programmes have been put into place to eradicate the disease(2-4). These programmes have achieved major successes and leprosy cases are now rare. In parts of the world where leprosy is still highly endemic the prevalence rates are low nearing the eradication targets. Previous studies carried out in 1994 in Karonga District in northern Malawi have shown an incidence of 11.2 cases per 10,000 persons per year(5) and India alone still contributed 70% of the global caseload in 1996 (3). In general eradication programmes are achieving their target prevalence rates. Despite the observed successes, there are some shortcomings that may in future hinder the attainment of desired target prevalence rates by these programmes. These shortcomings include poor case finding methods(3), existence of hidden prevalence(4) making it difficult to detect the disease before complications arise, patients not completing their treatment regimes and poor knowledge of the disease by the health workers(6) among others. In spite of these shortcomings, these programmes have to be congratulated because by the end of 1997(7), about thirty five of the countries with more than 100 registered cases of leprosy had achieved a prevalence rate of less than I per 10,000 inhabitants at the national level and 17 countries (24.6%) had prevalence rate of less than 2 per 10,000 inhabitants.

Leprosy usually presents with skin patches that have different colouration to the normal skin colour. Sometimes the initial presentation might be a neurological complication (8). A survey carried out by Robertson *et al*, showed that despite leprosy symptoms a lot of people (25%) do not take appropriate action to see a medical practitioner with about 21% visiting private doctors and only 9% visiting a hospital (9). Yet delayed presentation is a known risk factor for disability in leprosy. Therefore, cases of leprosy that do come to the hospital are usually at a critical stage. Disabilities caused by this disease make it imperative that leprosy is controlled and managed adequately.

Leprosy is categorised by the amount of the bacteria in the lesion and the type of the lesion that presents. It can therefore be categorised as multibacillary (more than five skin lesions) or paucibacillary. Moreover the lesions on the skin may be classified as tuberculoid, lepromatous or indeterminate. The progression of the

disease from infection to manifestation is very slow making it difficult to fully understand and control the spread of this disease. On the whole it is known that the disease is passed from one person to the other due to prolonged contact (10-13). Some have suggested that there might be genetic predisposition to the acquisition of this disease by an individual (11,12).

A lot of studies that were done on leprosy in Malawi were in Karonga district, which is a lake shore district in Northern Malawi (5, 14-16). Since leprosy is currently a rare disease in Malawi, this study was designed to find out the number of cases that have presented to Nkhotakota district hospital, along the central region of the lake shores of Malawi in the past nine years. Therefore a study was done to find out if indeed cases of leprosy still exist along the lake shore and in the central region of the country where data on this disease is scanty if at all available. The age distribution, sex and types of leprosy lesions at presentation were determined. It is hoped that the outcome of this study will help to shape the future control programme of leprosy in the district.

MATERIALS AND METHODS

This was retrospective study carried out in Nkhotakota district hospital. Nkhotakota is located in the central region of Malawi along lake Malawi. It borders with Nkhatabay in the North East, Mzimba to the North West, Kasungu to the West, Ntchisi to the South West and Salima to the South East. The district has four traditional authorities and two sub-traditional authorities. It has 605 villages and two lakes, lake Malawi to the East and lake Chikukutu to the West. There are also two lagoons, Chia in the South East and Bana in the North East. This district has a population of about 230,361 people (17). The district covers about 4,259 square kilometres with a population density of about 54 people per square kilometre. The elevations range from 163 meters above sea level to about 500 meters. The district has a tropical humid climate with an average annual rainfall of 1600 mm with absolute temperature range from 29°C in August to 36°C in October.

All records compiled between January, 1992 to April 2001 in the Dermatology department of Nkhotakota district hospital were reviewed to identify all cases that had one or more anaesthetic skin patches as a standard mode of leprosy diagnosis. The monthly records of positive cases were then analysed. As this is the only hospital in the district that can treat leprosy, the records were a representation of all identified cases of the disease in the district over the nine year period. Only cases with definitive gross diagnosis and treatment regime for leprosy were included. The age, sex and type of lesions were extracted from the records of the identified cases. Statistical analysis was done using EPI INFO 2000 statistical package. A p-value of 0.05 or less was considered significant.

RESULTS

A total of 526 cases of leprosy presented to the hospital in the nine year period between January 1992 to April 2001. Of these cases 57 (10.8%) were persons of 14 years or below and 469 (89.2%) were people of 15 years and above. The number of male cases was 250 (47.5%) and that of female cases was 276 (52.5%) regardless of age. Table I shows the number of cases per year and the prevalence rate per 10,000 population each year. It can be seen that the highest prevalence rates were reported in 1995 followed by 1997 and 1998 which both had 3.17 cases per 10,000 persons. 1992 had the lowest prevalence rates of 0.998 cases per 10,000 persons. There were 80 cases of multibacillary leprosy compared to 446 cases of paucibacillary leprosy. The largest number of multibacillary cases were noted in the males in 1995 and the least were in the females in 1994 when no female presented with this type of leprosy. In contrast in 1997, 44 females presented with paucibacillary leprosy being the largest group of people. The lowest number of paucibacillary leprosy presented in 1992 also in the female population. Table 2 shows the type and sex distribution of leprosy according to age. Eighty four percent of leprosy infected people had a paucibacillary type of leprosy giving a nine year cumulative prevalence rate of 19.3 cases per 10,000 persons while 15.2% of infected people had a multibacillary type of leprosy giving a nine year cumulative prevalence rate of 3.5 cases per 10,000 persons ($p < 0.0000001$). However when sex distribution is compared, males were more affected by multibacillary leprosy than females ($p < 0.0001$). In contrast, more females were affected by paucibacillary leprosy ($p < 0.01$) than males. Of the 57 people in the age of 14 years and below that presented with leprosy, only four had multibacillary leprosy and the rest presented with paucibacillary leprosy. In the age range of l5 years and above, only 76 patients had multibacillary leprosy. Both sexes were equally affected by either multibacillary or paucibacillary leprosy in the youth. This was not the case in the adult patients. In the older age groups 57 males had multibacillary leprosy compared to only 19 females ($p < 0.0001$). As observed before, more females presented with paucibacillary leprosy in the older age group. The greatest numbers of leprosy were observed in the youth in 1999 all being paucibacillary leprosy cases. The least numbers of leprosy in adults were observed in 1992 and greatest numbers in 1997. As can be noted from Table 3, there were no cases of leprosy observed in the youth in 1992.

Table 1

Number of cases and the prevalence rate per 10,000 of population per year

	Sex	Multibacillary Leprosy	Paucibacillary Leprosy	Total	Prevalence per 10,000 persons
-					
1992	Male	6	10	16	0.998
	Female	1	6	7	
1993	Male	3	19	22	2.65
	Female	2	37	39	
1994	Male	7	26	33	3.39
	Female	0	22	22	
1995	Male	12	25	50	
	Female	1	27	28	2.34
1996	Male	10	15	25	
	Female	7	22	29	
1997	Male	3	23	26	3.17
	Female	3	44	47	
1998	Male	6	23	29	3.17
	Female	2	42	44	
1999	Male	1	26	27	2.17
	Female	1	22	23	
2000	Male	3	13	16	1.82
	Female	2	24	26	
200I	Male	8	11	19	1.3
	Female	2	9	11	
Total		80	446	526	22.8

Table 2

Type, age and sex distribution of leprosy at Nkhotakota District Hospital

	Multibacillary Leprosy			Paucibacillary Leprosy		
Age Group	Male	Female	Total	Male	Female	Total
0-14	2	2	4	26	27	53
15+	57	19	76	165	228	393
Total	59	21	80	191	255	446
Percentage	11.2	4	15.2	36.3	48.5	84.8
Cumulative Prevalence (rates per 10,000) over 9 years	2.56	0.91	3.5	8.3	11.0	19.3

Table 3

Yearly records of type of leprosy according to age

Year	Age (years)	Multibacillary Leprosy	Paucibacillary Leprosy	Total
1992	0-14	0	0	0
	15+	7	16	23
1993	0-14	1	5	6
	15+	4	51	55
1994	0-14	0	4	4
	15+	7	44	51
1995	0-14	0	7	7
	15+	13	45	58
1996	0-14	0	4	4
	15+	17	33	50
1997	0-14	0	7	7
	15+	6	60	66
1998	0-14	1	9	10
	15+	7	56	63
1999	0-14	0	11	11
	15+	2	37	39
2000	0-14	2	3	5
	15+	3	34	37
2001	0-14	0	3	3
	15+	10	17	27
Total		80	446	526

DISCUSSION

Nkhotakota is a district along the lake shores of Malawi where historically leprosy cases have been identified(5,14-16). The highest prevalence rate registered in this study is 3.39 cases per 10,000 observed in 1995. This prevalence is lower than the incidence rate of 11.2 cases per 10,000 person years earlier found in Karonga district(5) and the prevalence rate of the Amazonas State of Brazil, which was 12.9 cases per 10,000 inhabitants in 1995(4). The nine year cumulative prevalence rate of multibacillary leprosy was lower than that of paucibacillary. This is in agreement with studies of Ponnighaus *et al*.(5) who also found a lower incidence of multibacillary leprosy to paucibacillary leprosy in Karonga district. Just as in their study, the majority of cases in the present study are in adult females who presented with paucibacillary lesions. In the youth both sexes are equally affected by multibacillary or paucibacillary lesions. This is in contrast with studies carried out in India where 132 cases of leprosy were detected in children of ages three to 19 years over approximately the same period of time as the current investigation. In the Indian study, multibacillary leprosy cases were higher than in the present study. Moreover, more males were infected by leprosy than females in the 10-14 year age range(18). In the current study more adult males were infected by multibacillary leprosy than females a fact that is well established in the previous studies in Malawi(13). The reverse is true for paucibacillary leprosy. The high proportion of paucibacillary leprosy observed in the present study is consistent with studies done by Mandal *et al.*(19). They too found a high proportion of paucibacillary leprosy and a higher incidence of leprosy cases in males in general. Their study compares well to the present study, since they too found out that males had by far the highest proportion of multibacillary leprosy and the females had more paucibacillary cases than their male counterparts. On the whole the number of the youth affected in their study was very small when compared to adults.

Since the life expectancy in Nkhotakota is 44 years for males and 47 years for females(17), the low numbers of the youth infected by leprosy is encouraging. In previous studies in Malawi, it has been shown that dwelling contacts with multibacillary patients are at five to eight fold increase risk of leprosy while those of paucibacillary contact have a two fold increased risk(13). Therefore it has been concluded that paucibacillary leprosy may not be a source of infection but a marker that one has been in contact with some outside source of infection. It is therefore possible that adults come into contact with leprosy-infected people outside their households more than the youth since the numbers of leprosy were greater in the adults than the youths. In addition studies done in Malawi have also shown that extended schooling and good housing conditions are associated with reduced leprosy(14). It is therefore possible that the youth are spending their time longer at school thereby reducing their exposure to

mycobacterium leprae. The other explanation is that BCG vaccine might be protecting the youth from leprosy(11,15,20). Since all cases of leprosy are at present recommended for multidrug therapy, it is hoped that as people get cured from their disease less cases will present to the hospital in the near future. This was observed already in 2000 when the number of cases fell to 42 from the highest number of 78 in 1995.

The interesting observation in this investigation was that the highest number of cases were observed in the three years of 1995, 1997 and 1998. During this time, there were some funds available for active screening programme. Despite this active screening the number of multibacillary cases detected were comparable to the years when screening was not available. This is a positive development because previous studies have shown that the proportion of people with disabilities at registration, which are mainly attributed to multibacillary leprosy, were higher among males than females and also higher for passively than actively detected patients(16). As is well known that multibacillary leprosy can cause a lot more complications like cataracts(21), high rates of defaulting(22) and relapses after treatment(23,24), the present investigation highlights the need for continued surveillance for leprosy. This study has also shown that leprosy though at a very small scale is a problem in Malawi and obviously there are hidden cases in the community that have to be unveiled. It is hoped that active screening will ensue along the lake shore districts so that cases of leprosy can be detected before people suffer the long-term consequences of the disease.

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