

Lymphoedema and its management in cases of lymphatic filariasis: the current situation in three suburbs of Matara, Sri Lanka, before the introduction of a morbidity-control programme

T. C. YAHATHUGODA, D. WICKRAMASINGHE, M. V. WEERASOORIYA and W. A. SAMARAWICKREMA

Filariasis Research Unit, Faculty of Medicine, University of Ruhuna, P.O. Box 70, Galle, Sri Lanka

Received 9 September 2004, Revised 14 March 2005,

Accepted 17 March 2005

Using in-depth interviews, information on the current state of lymphoedema management was collected from 101 cases of lymphatic filariasis with lymphoedema in three suburbs of Matara. The interviews were conducted prior to the introduction of a programme of community home-based care (CHBC) that incorporates modern lymphoedema-management strategies. Thirty-two of the interviewees had severe lymphoedema (of grade III or above). The male interviewees had significantly more entry lesions than the female. Most of the subjects had suffered from episodes of limb pain with fever, although the incidence of these episodes appeared unrelated to the severity of the lymphoedema. The frequency of the episodes of limb-pain/fever in the 12 months prior to the interviews appeared unrelated either to the level of daily hygiene, which was generally poor, or to the frequency of bathing. Many (65%) of the subjects paid no attention to limb care when bathing, and 44% did not use footwear. Over 80% made no effort to keep their afflicted limbs elevated, and 95% did not exercise. Most of the female interviewees felt shameful of their condition and were, in consequence, less likely to attend government clinics, for treatment, than the male interviewees. The drug treatment that the interviewees had received was often inadequate, and most had stopped seeking treatment because they had not perceived any significant treatment-attributable improvement in their condition. Modern lymphoedema-management strategies (based on regular washing, careful drying, and treatment, with antifungal, antibiotic or emollient creams, of the affected limbs, limb elevation, exercise, and use of footwear) had not reached the study communities and the local physicians were not aware of them. When dermatology life-quality indexes (DLQI) were calculated for the interviewees, the 26 most impaired subjects gave scores of 5–15 (mean=8.6). The DLQI for these subjects will be regularly re-evaluated, as a measure of the effectiveness of the CHBC programme that has now begun.

An estimated 14 million people suffer from lymphoedema and elephantiasis of the leg caused by lymphatic filariasis (Dreyer *et al.*, 2002). Over time, filarial lymphoedemas become permanent and associated with repeated painful episodes of bacterial adenolymphangitis (ADL), which cause considerable acute morbidity (Kumaraswami, 2000) and hasten the progression of the lymphoedema (Pani *et al.*, 1990, 1995;

Shenoy *et al.*, 1998). Although filarial lymphoedemas are often associated with severe stigma and economic loss (Ramu *et al.*, 1996; Dreyer *et al.*, 1997; Babu and Nayak, 2003a), those affected and their families and physicians often believe that little can be done to prevent lymphoedemas or to reduce the morbidity associated with them (Dreyer *et al.*, 2002). Simple but effective strategies for slowing the progression of lymphoedema and reducing the associated morbidity have, however, been developed in the last few years (Dreyer *et al.*,

Reprint requests to: M. V. Weerasooriya.
E-mail: miraniweera@yahoo.co.uk; fax: +94 91 222 2314.

2002). The Global Programme to Eliminate Lymphatic Filariasis (GPELF), which was launched by the World Health Organization in 1999 (Ottesen, 2000), now has two principal goals: to interrupt the transmission of the parasites that cause lymphatic filariasis (LF), by mass drug administrations (MDA), and to alleviate the suffering and disability caused by the disease, via morbidity control (Ottesen, 2000).

In Sri Lanka, bancroftian filariasis is endemic in three provinces on the western or southern coasts. Approximately 10 million people live in the endemic area, which covers eight of the 25 districts into which Sri Lanka is divided (T. S. Liyanage, unpubl. obs.). The clinical manifestations of LF in this area were first described by Abdulcader and Sasa (1966). Several decades later, Weerasooriya *et al.* (2001) reported the results of epidemiological studies on LF in three suburbs of the town of Matara, in southern Sri Lanka, and Chandrasena *et al.* (2004) described the knowledge, practices and perceptions, relating to lymphoedema management, of patients attending clinics in Gampaha district, close to Colombo. The main aim of the present study was to record baseline information on the lymphoedema-associated morbidity and lymphoedema-management practices in individuals from three suburbs of Matara, before a morbidity-control programme based on the new strategies was launched.

SUBJECTS AND METHODS

Study Area

The subjects investigated lived in the three inter-connected suburbs of Polhena, Walgama and Madihe, immediately to the west of the town of Matara and 160 km to the south of Colombo. The population, housing, terrain and occupation of the people in these suburbs, which lie within the coastal belt where bancroftian filariasis is endemic, have already been described by Weerasooriya *et al.* (2001). The detailed maps, showing the

streets and houses in the study area, which Weerasooriya *et al.* (2001) prepared, using maps from the national survey department, were also used for the present study.

Study Population

During the original epidemiological survey of the area by Weerasooriya *et al.* (2001) and subsequent (unpublished) surveys, cases of irreversible lymphoedema in different stages of advancement were observed and recorded. Guided by these records, an attempt was made to give each lymphoedema case living in the study area a detailed examination. The gender, age, occupation, and socio-economic characteristics of each case were recorded, and each was asked for their informed consent to participate in the planned morbidity-control programme. The severity of the lymphoedema seen in each case was graded I–VI, as described by Dreyer *et al.* (2002). During the interviews, the hygiene of the lymphoedema-affected limbs was categorised as poor (when there was dust on the limb, with entry lesions, odour and eczema, and the subject did not have footwear), moderate (when there was dust on the limbs but there were no entry lesions, odour or eczema, and the subject did or did not have footwear) or good (when the limbs were devoid of dust, there were no entry lesions, odour or eczema, and the subject had footwear).

Questionnaires

A questionnaire was developed and used, in interviews, to collect information on the current morbidity in each subject, and information on each subject's lymphoedema-management practices. Each subject was interviewed once in his or her home. The subjects were asked about the duration of their condition, when they first observed the appearance of the swelling, any reasons they attributed to it, any history of lymphoedema in the family, how often they suffered episodes of limb pain with fever, their current treatment and limb-care practices, the physical

difficulties they experienced daily because of the lymphoedema, other methods of lymphoedema management, treatment-seeking behaviours, the type of medication they had received, and the expenditure incurred. Subjects were also asked about their bathing habits and care of the affected limbs while bathing, their use of water and soap, the methods they used to dry their skin, and their use of bandages. The subjects were asked about their own feelings about being ill with lymphangitis, what their feelings were towards people who were 'normal', and whether they had family problems as a result of their illness. They were also asked about the extent of the support they had, the attitude of their supporters towards them, and whether they would like community gatherings of lymphoedema cases in which they could discuss their problems with people who were similarly afflicted. Finally, a few questions were included in the questionnaire to ascertain each interviewee's knowledge, attitudes and perceptions (KAP) on LF and their condition.

Dermatology Life-quality Index

As lymphoedema is a handicap to the sufferers in much the same way as a skin disease, it seemed reasonable to calculate a dermatology life-quality index (DLQI) — which was originally designed to assess accurately the effect of skin disease on the quality of life of patients (Finlay and Khan, 1994) — for each of the lymphoedema cases. The DLQI is based on 10 questions covering symptoms, feelings, daily activities, leisure, work, personal relationships, and treatment. The answer to each question is given a score and all the scores are then summed to give the DLQI, which may range from 0 to 30. The higher the score the more impaired the interviewee's quality of life. Interviewee's with scores of 5 or higher were considered those who would benefit most from the introduction of a modern programme of community home-based care (CHBC).

Ethics and Data Analysis

The study protocol was approved by the ethics committee of the Faculty of Medicine at the University of Ruhuna in Galle, Sri Lanka.

All the data were recorded and analysed using version 10.0 of the SPSS software package (SPSS Inc, Chicago, IL).

RESULTS

Lymphoedema Cases

Overall, 117 lymphoedema cases (90 females and 27 males) were detected in the study area. Most (55 females and 13 males) were residents of Walgama but 28 (18 females and 10 males) lived in Polhena and 21 (17 females and four males) in Madihe. The overall male:female ratio was 1:3.35. As 11,528 people lived in the study area at the time of the interviews, the prevalence of lymphoedema in the area was estimated to be 1.01%. The subjects of the present study were the 101 cases who agreed to participate (Table 1).

Most of the subjects — 66 (86%) of the females and 22 (92%) of the males — were aged >50 years. Most of the female subjects (84%) did not work for a living, stayed at home, and were dependent on other members of their families for food, clothing, shelter and medicine, although they bathed themselves. Among the male subjects, those who worked (54%) and those who remained at home (46%) were roughly equal in number.

Most (78%) of the subjects were married and all the subjects who had ever been married had developed lymphoedema after marriage and remained married despite the condition. All the adult cases who were unmarried believed that they had not married because of their lymphoedema.

The oldest cases investigated (the 88 aged >50 years) said that they had had their lymphoedemas for >30 years. Only nine of the subjects had developed lymphoedemas within the previous 5 years. Most (60%) of

TABLE 1. *Characteristics of the 101 lymphoedema cases investigated*

Characteristic	No. and (%) of cases
GENDER	
Male	20 (20)
Female	81 (80)
AGE (years)	
11–20	1 (1)
21–30	1 (1)
31–40	1 (1)
41–50	10 (10)
≥51	88 (87)
OCCUPATION	
None	78 (77)
Non-skilled	10 (10)
Semi-skilled	3
Skilled	7 (7)
Professional	3 (3)
DEPENDENCY	
Dependent	81 (80)
Non-dependent	20 (20)
NON-DEPENDENT'S MONTHLY INCOME (Sri Lankan rupees)*	
1000	3 (15)
1001–2500	3 (15)
2501–5000	7 (35)
≥5001	7 (35)
MONTHLY INCOME OF SUPPORTING FAMILY (Sri Lankan rupees)†	
1000	3 (3)
1001–2500	12 (12)
2501–5000	26 (26)
≥5001	34 (34)
MARITAL STATUS	
Single	22 (22)
Married	79 (78)
LOCATION OF LYMPHOEDEMA	
Right or left lower limb	77 (77)
Both lower limbs	22 (22)
Both lower limbs and an arm	1 (1)
All four limbs	1 (1)
LYMPHOEDEMA GRADE	
I	2 (2)
II	67 (66)
III	24 (24)
IV	5 (5)
V	1 (1)
VI	2 (2)
DURATION OF LYMPHOEDEMA (years)	
<5	9 (9)
6–10	5 (5)
11–40	57 (56)
≥41	30 (30)

*The percentages shown relate to the 20 non-dependent cases.

†The percentages shown relate to the 75 dependent cases for whom details of family income were available.

the subjects said that their oedema had appeared after a bout of fever, the rest relating onset to a small injury, sprain of the limb or a centipede bite. Twenty-three (23%) of the subjects said that they had a family history of lymphoedema. There were three families in which all the daughters of the heads of household had lymphoedema and were unmarried.

Most (76%) of the subjects had lymphoedema in one limb but 22% had it in two limbs (in each case, in both legs), one female had it in three limbs, and another female had it in all four limbs.

Although two subjects (both female) only had grade-I lymphoedema, 49 (64%) of the females and 18 (75%) of the males had grade-II, 22 (29%) of the females and two (8%) of the males had grade-III, three (4%) of the females and two (5%) of the males had grade-IV, one male had grade-V, and one female and one male each had grade-VI.

Limb Pain and Fever

Most of the subjects, whether female (88%) or male (88%), said that they had experienced limb pain with fever in the past (no detailed examinations for ADL attacks were performed). As gender appeared to have no effect on the reported episodes of limb pain with fever, the relevant data for both sexes were pooled. Only 57% of the subjects

reported that they had experienced episodes of limb pain with fever in the previous year. The number of episodes experienced by the subjects in the previous year, and numbers of subjects found to have entry lesions, are shown in Table 2, split by the grade of lymphoedema.

Twelve subjects said they had never experienced episodes of limb pain with fever, and 31 said they had not suffered such episodes in the 12 months prior to the interviews. Of the 24 subjects with grade-III lymphoedema, 18 complained of more than three attacks during the previous year. Four of the five subjects with grade-IV lymphoedema had entry lesions and had experienced more than three episodes during this period.

Limb Hygiene

Limb hygiene was poor in 30 (39%) of the female subjects and 13 (54%) of the male but there was no apparent correlation between the standard of limb hygiene and the frequency of the episodes of limb pain with fever ($P > 0.05$).

Entry Lesions

Entry lesions were detected in 32 individuals (12 males and 20 females). In 10 males and 17 females, the lesions were located in the

TABLE 2. The frequencies of episodes of limb pain with fever (ELP) during the previous 12 months, in relation to grade of lymphoedema

Lymphoedema grade	Investigated	No. of cases:						Entry lesions
		0 ELP	1-2 ELP	3-4 ELP	5-7 ELP	8-12 ELP	>12 ELP	
I	2	1	0	0	0	0	0	0
II	67	23	0	22	0	10	2	15
III	24	6	0	12	0	4	2	11
IV	5	1	0	3	0	1	0	4
V	1	0	0	0	0	0	0	1
VI	2	0	0	1	0	0	1	1
Any	101	31	0	38	0	15	5	32

toe webs and skin creases. One male subject and one female had eczema. One male subject and two female had minor injuries. Overall, at the time of the interviews and examinations, 15 of the subjects with lesions had grade-II lymphoedema, 11 had grade-III, and four had grade-IV.

Treatment

Most of the subjects (88% of the females and 81% of the males) had sought treatment or treated themselves for at least one episode of limb pain with fever; most (53%) of the males had visited a government-run filariasis clinic whereas most (55%) of the women had sought treatment from private practitioners in clinics close to their villages. Overall, 71% of the female subjects but only 42% of the males ($P < 0.005$) said they were too shy or too embarrassed by their lymphoedema to attend a government-run clinic in the centre of Matara.

Most (94%) of the subjects who had received any treatment had received paracetamol and penicillin, as symptomatic treatment for the limb pain with fever. Some private practitioners had given both this symptomatic treatment and antifilarial treatment with diethylcarbamazine (DEC), and a few had given DEC only. The staff in government-run clinics had issued oral penicillin, DEC or a combination of the two drugs. A few women (about 10% of the treated female subjects) had been given traditional, herbal medicines, and 13% of the treated female subjects had treated themselves, mainly with paracetamol and the application of oils.

At the time of the interviews, most (83%) of the subjects had stopped attending clinics because they had perceived no treatment-attributable improvement in their condition. Most of the subjects said they disliked consuming drugs. Neither limb-care methods nor exercise had been recommended by any clinician, to any subject. Only a very few subjects had been told to bandage their affected limb(s).

The subjects who had attended government-run clinics had received free treatment and each had spent only about 50 Sri Lankan rupees (U.S.\$0.50)/visit, in travel costs etc. The subjects who had sought treatment at private clinics had each incurred expenditures in excess of 250 Sri Lankan rupees (U.S.\$2.50)/visit — a cost most subjects found unaffordable.

Personal Hygiene

The bathing habits of the subjects varied considerably: 23% had daily baths, 22% bathed every other day, and 37% bathed three times a week. Several of the interviewees (18%) bathed less than once a week. There was no significant correlation between the frequency of bathing and either the incidence of episodes of limb pain with fever (in the previous 12 months) or the grade of lymphoedema (at the time of the interviews). Most of the subjects (66% of the females and 62% of the males) paid no particular attention to their affected limb(s) while bathing.

Apart from routine bathing, most of the subjects either did not wash their affected limbs (45%) or washed their affected limbs using methods that would not be considered good in a modern programme of limb-care (50%), such as that described by Dreyer *et al.* (2002). Most subjects who washed their affected limbs (89% of the 55 'limb washers') used cold or warm tap water to clean their limbs. Nineteen (34%) of the limb washers did not use soap or soap substitutes, fearing that this would make their skin condition worse, but the others used toilet soap (25), detergent soaps sold for the washing of clothes (five), or soap substitutes (six).

Of the 55 limb washers, 17 (31%) used abrasive brushes and smooth stones to clean their limbs, eight (15%) used a clean piece of cloth to clean any deep skin creases and the webs between their fingers and toes, and the other 30 (54%) used no objects to help clean their affected limbs. All the subjects who used clean pieces of cloth to wash their limbs used the same or similar cloths to help

dry their limbs, the other limb washers allowing their limbs to dry naturally. The application of antiseptic creams was rare.

Care of the Limbs

Nearly half (44%) of the interviewees — 15 (62%) of the males and 29 (38%) of the females — did not use footwear at all. Forty-eight (62%) of the female subjects wore slippers outdoors only (39) or both outdoors and indoors (nine). Most of the subjects (81% of the females and 88% of the males) made no effort to keep their affected limbs elevated when possible, 82% saying they were too busy during the day to have their limbs elevated. Only five (5%) of the subjects — all of whom were regularly attending government-run clinics — had ever performed any limb exercises, only 40 (40%) had used crepe bandages at the onset of their lymphoedema, and only 20 (50%) of these 40 thought the bandaging had been beneficial.

Problems of the Lymphoedema Cases

Most (70%) of the female interviewees but only 10 (42%) of the males said they were embarrassed by their lymphoedema ($P < 0.05$). Forty-two (55%) of the females said they felt a sense of shame and hopelessness when they met 'normal', healthy people, and 27 (35%) were very worried about their lymphoedema all the time. Eight (10%) of the female interviewees claimed to have experienced major problems (failure to marry, separation from their husbands, loss of work, and/or frequent hospitalization) because of their lymphoedema. The other female subjects complained of minor problems, such as infrequent fever episodes, the need for special clothing to cover their affected limbs, and inability to use footwear. The cases with the more severe grades of lymphoedema complained of physical problems, such as difficulty in standing and/or walking and discomfort because of the heaviness of the affected limb(s).

Care and Support

Almost all of the lymphoedema cases investigated — 90% of the females and 92% of the males — claimed to be well supported by their families, who were very sympathetic towards them. Only a few of the subjects were supported by members of the community who were not relatives but helped the subjects as a duty to the elders, and support from neighbours was rare. The public-health nurses who visited the study communities were not trained in the care of lymphoedemas and, even if they had been trained, did not have time to give lymphoedema care themselves.

Community Gathering

Many of the older interviewees said they would be willing to attend gatherings of local lymphoedema cases, to discuss their problems. The younger subjects, however, tended to keep to themselves and they, and those cases who found walking or standing difficult, were generally reluctant to participate in community gatherings.

KAP Study

Most (82%) of the subjects knew some of the facts about filariasis, having lived in the endemic area a long time, but only 38% (all from the younger age-groups investigated) knew that a person could be infected with (the parasites causing the) disease without being symptomatic. Only one interviewee said that lymphoedema was caused by a worm infection, whereas 45% of the subjects said it was caused by mosquito bites. Nearly half the subjects (49%) simply said they did not know the cause of lymphoedema. Over 33% said that lymphoedema could be cured (always by drug treatment). Of the 59 subjects who said that lymphoedema could be prevented, 59% said it could be prevented by drugs and the others that it could be prevented by protection against mosquito bites. Only 31% of the interviewees said that the disease causing lymphoedema was communicable, and 28% said

they had no idea how the (parasite causing the) disease was transmitted.

DLQI

When DLQI were calculated, 26 of the subjects were found to have scores higher than 5. These 26 most disabled subjects had a mean DLQI of 8.6. (range=5–15). Grade of lymphoedema and DLQI score were found to be significantly and positively correlated ($P<0.005$).

DISCUSSION

In some of the early reports on the morbidity of LF, the general clinical epidemiology (Pani *et al.*, 1991) and disease (Gyapong *et al.*, 1994), the episodic ADL and lymphoedema (Pani *et al.*, 1995; Shenoy *et al.*, 1995) and the acute filarial episodes (Ramaiah *et al.*, 1996) were described. At the time these reports were published, most cases of lymphoedema thought that elephantiasis was irreversible and that there was little hope of improvement in their condition (Dreyer *et al.*, 2002). The health workers and clinicians who were responsible for the lymphoedema cases felt equally helpless, and unable to provide any effective care for the cases (Dreyer *et al.*, 2002). After nearly two decades of lymphoedema case-management and clinical research, however, Dreyer *et al.* (2002) pioneered a new understanding of the basic management of LF and the associated lymphoedema. They found that relatively simple methods, which could be followed by the cases themselves or their families, could halt the progression of elephantiasis and even reverse the damage already present. These methods include: the regular washing of the affected parts with soap and water, followed by careful drying; the use of emollients, as necessary; the treatment of entry lesions with antifungal or antibacterial creams; the regular elevation of the afflicted limbs, to prevent accumulation of fluid; the regular, low-intensity movement of the joints of the affected limb; and protection of the skin

by use of footwear (Dreyer *et al.*, 2002). By eliminating bad odour, helping entry lesions heal, improving the case's self-confidence, often reducing the size of the afflicted limb, and often improving the cases's ability to work, such measures can markedly improve the lives of those with lymphoedema (Dreyer *et al.*, 2002).

Initially, the GPELF had a single goal — interruption of the transmission of the parasites causing LF, by annual mass treatments with antifilarial drugs — but it soon became clear that the suffering of those already afflicted by the disease needed attention. Morbidity control was therefore adopted as the second goal of the programme (Dreyer *et al.*, 2002) and, in consequence, has received greater attention in all the countries where LF is endemic. By the late 1990s, pilot programmes of lymphoedema management had been launched in Brazil and Haiti, and feasibility studies had begun in Tanzania and Nigeria (Dreyer *et al.*, 2002). In India, Shenoy *et al.* (1998) reported the encouraging results of a study on lymphoedema management based solely on the careful washing and drying of the afflicted limbs, and these practices were introduced into public-health programmes. As the new strategies for lymphoedema management often require daily care for life, it was soon recognized that the cases themselves or their families would have to be largely responsible for the care, rather than the over-burdened health services (WHO, 2003). A policy framework for a programme of community home-based care was therefore developed (WHO, 2003). Unfortunately, as reflected by the present results, not only have CHBC programmes not reached all endemic communities but many such communities also remain unaware of the newer management methods and their considerable benefits. In the present study, although episodes of limb pain with fever were found to be quite common (especially in those with grade-II or grade-III lymphoedema), there was no indication of any active practice of limb

care, and the routine hygiene of the lymphoedema cases was generally poor, with <50.0% bathing once every 2 days or more frequently. Many of the cases made no attempt to wash their affected limbs between baths, and those who did wash there limbs did not do it in the best way [i.e. as recommended by Dreyer *et al.* (2002)], often using too abrasive, hard and stiff material to clean their skin. Only a few cases used a clean cloth to dry their limbs, and most cases were too busy during the day to have their limbs elevated. None of the cases investigated exercised their limbs, and many (almost 50%) never used any footwear. Many of the cases, especially the women, were too embarrassed to travel to government-run clinics. Most cases seeking treatment were not given information about the more effective lymphoedema-management methods, presumably because many local clinicians were unaware of the developments made in lymphoedema-management in the last decade. In Pondicherry, India, Schellekens *et al.* (2005) recently found that only 10% of physicians gave advice on limb hygiene to lymphoedema cases. News about the newer methods of limb care has, however, reached some Sri Lankan clinicians and endemic communities. When, for example, Chandrasena *et al.* (2004) investigated lymphoedema cases in the Gampaha district in the Western province, they found that modern limb-care practices had been recommended to many of the cases, when they attended clinics set up by the national antifilaria campaign (AFC). In consequence, many of the cases were practising some lymphoedema-management measures, especially the regular washing of the affected limbs with soap and water. The lymphoedema-management measures of the cases from Gampaha were not, however, ideal; many of the cases used rough abrasive materials to clean the limbs and few elevated or exercised their affected limbs on a regular basis. Chandrasena *et al.* (2004) also reported that the lymphoedema cases who had not attended the antifilaria

clinics were not aware of any of the modern morbidity-management methods. These non-attendees were similar to the cases investigated in the present study. When Babu and Nayak (2003b) assessed footcare and knowledge on footcare among 90 lymphoedema cases attending a clinic in Kakinada, Andhra Pradesh, India, only 17 of the cases reported that they made any special efforts to keep their affected limbs clean. None of the cases exercised their limbs, and only seven of the cases reported massaging their affected limbs, although 35 claimed to elevate their affected limbs regularly. Sadly, the cases had received no guidance on the care of their limbs. In a recent study in Pondicherry, India, Nanda and Ramaiah (2003) similarly observed that neither the local lymphoedema cases nor the local clinicians were aware of modern lymphoedema-management practices. Morbidity-control clinics clearly need to be established close to all endemic communities, so that lymphoedema cases and their care-givers can be advised and educated about the modern methods of limb care.

As a measure of quality of life, the DLQI has been accepted in the U.K. and applied to many skin conditions (Jobanputra and Bachmann, 2000; Etemesi, 2002). In Guyana, the index was recently and successfully applied to lymphoedema cases, for the first time (McPherson, 2004). In the present study, the cases with a DLQI score of 5 or higher were considered those who would benefit most (and should therefore be the main targets of) a CHBC programme. Such a programme has now been launched in the study communities and the DLQI of the present cases who scored 5 or higher will be re-evaluated each year, as a measure of the programme's effectiveness.

ACKNOWLEDGEMENTS. The study was funded by the Lymphatic Filariasis Support Centre at the Liverpool School of Tropical Medicine, Liverpool, U.K. The authors thank Dr R. A.

Dharmadasa, for his assistance in the field, and Dr A. Y. Finlay, for his permission to use the DLQI.

REFERENCES

- Abdulcader, M. H. M. & Sasa, M. (1966). Epidemiology and control of bancroftian filariasis in Ceylon. *Japanese Journal of Experimental Medicine*, **36**, 609–646.
- Babu, B. V. & Nayak, A. N. (2003a). Treatment cost and work time loss due to episodic adenolymphangitis in lymphatic filariasis patients in rural communities of Orissa, India. *Tropical Medicine and International Health*, **8**, 1102–1109.
- Babu, B. V. & Nayak, A. N. (2003b). Footcare among lymphoedema patients attending a filariasis clinic in South India: a study of knowledge and practice. *Annals of Tropical Medicine and Parasitology*, **97**, 321–324.
- Chandrasena, T. G. A. N., Premaratna, R. & de Silva, N. R. (2004). Lymphoedema management knowledge and practices among patients attending filariasis morbidity control clinics in Gampaha district, Sri Lanka. *Filaria Journal*, **6**, 1–6.
- Dreyer, G., Noroes, J. & Addiss, D. (1997). The silent burden of sexual disability associated with lymphatic filariasis. *Acta Tropica*, **63**, 57–60.
- Dreyer, G., Addiss, D., Dreyer, P. & Noroes, J. (2002). *Basic Lymphoedema Management*. Hollis, NH: Hollis Publishing.
- Etemesi, B. A. (2002). Quality of life in Tanzanian adults with chronic skin disease. *Annals of Dermatology and Venereology*, **129**, 253.
- Finlay, A. Y. & Khan, G. K. (1994). Dermatology Life Quality Index (DLQI) — a simple practical measure for routine clinical use. *Clinical and Experimental Dermatology*, **19**, 210–216.
- Gyapong, J. O., Magnussen, P. & Binka, F. N. (1994). Parasitological and clinical aspects of bancroftian filariasis in Kassa-Nankana district, upper east region, Ghana. *Transactions of the Royal Society of Tropical Medicine and Hygiene*, **88**, 555–557.
- Jobanputra, R. & Bachmann, M. (2000). The effect of skin diseases on quality of life in patients from different social and ethnic groups in Cape Town, South Africa. *International Journal of Dermatology*, **39**, 826–831.
- Kumaraswami, V. (2000). The clinical manifestations of lymphatic filariasis. In *Lymphatic Filariasis*, ed. Nutman, T. B. pp. 103–126. London: Imperial College Press.
- McPherson, T. (2004). Impact on the quality of life of lymphoedema patients following introduction of a hygiene and skin care regimen in a Guyanese community endemic for lymphatic filariasis: a preliminary clinical intervention. *Filaria Journal*, **2**, 1–5.
- Nanda, B. & Ramaiah, K. D. (2003). Lymphoedema management measures practised by cases of chronic lymphatic filariasis. *Annals of Tropical Medicine and Parasitology*, **97**, 427–431.
- Ottesen, E. A. (2000). The Global Programme to Eliminate Lymphatic Filariasis. *Tropical Medicine and International Health*, **5**, 591–594.
- Pani, S. P., Krishnamoorthy, K. & Rao, A. S. (1990). Clinical manifestations in Malayan filariasis infection with special reference to lymphoedema grading. *Indian Journal of Medical Research*, **91**, 200–207.
- Pani, S. P., Yuvaraj, J., Vanamail, P., Danda, V., Michael, E., Grenfell, B. T. & Bundy, D. A. P. (1995). Episodic adenolymphangitis and lymphoedema patients with bancroftian filariasis. *Transactions of the Royal Society of Tropical Medicine and Hygiene*, **89**, 72–74.
- Ramaiah, K. D., Ramu, K., Vijay Kumar, K. N. & Guyatt, H. (1996). Epidemiology of acute filarial episodes caused by *Wuchereria bancrofti* infection in two rural villages in Tamil Nadu, South India. *Transactions of the Royal Society of Tropical Medicine and Hygiene*, **90**, 639–643.
- Ramu, K., Ramaiah, K. D., Guyatt, H. & Evans, D. B. (1996). Impact of lymphatic filariasis on the productivity of male weavers in a South Indian village. *Transactions of the Royal Society of Tropical Medicine and Hygiene*, **90**, 669–670.
- Schellekens, S. M., Ananthkrishnan, S., Stolk, W. A., Habbema, J. D. F. & Ravi, R. (2005). Physicians' management of filarial lymphoedema and hydrocoele in Pondicherry, India. *Transactions of the Royal Society of Tropical Medicine and Hygiene*, **99**, 75–77.
- Shenoy, R. K., Sandhya, K., Suma, T. K. & Kumaraswami, V. (1995). A preliminary study of filariasis related acute adenolymphangitis with special reference to precipitating factors and treatment modalities. *Southeast Asian Journal of Tropical Medicine and Public Health*, **26**, 301–305.
- Shenoy, R. K., Suma, T. K., Rajan, K. & Kumaraswami, V. (1998). Prevention of acute adenolymphangitis in brigian filariasis: comparison of the efficacy of ivermectin and diethylcarbamazine, each combined with local treatment of the affected limb. *Annals of Tropical Medicine and Parasitology*, **92**, 587–594.
- Weerasooriya, M. V., Weerasooriya, T. R., Gunawardena, N. K., Samarawickrema, W. A. & Kimura, E. (2001). Epidemiology of bancroftian filariasis in three suburban areas of Matara. *Annals of Tropical Medicine and Parasitology*, **95**, 263–273.
- World Health Organization (2003). *Global Programme to Eliminate Lymphatic Filariasis. Basic Principles and Framework for Action for the Prevention of Lymphatic-filariasis-related Disabilities*. Geneva: WHO.