

Caring for patients in the global programme to eliminate lymphatic filariasis

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Clinical lymphatic filariasis (LF) is a debilitating, disfiguring medical condition with severe psychosocial consequences for patients and their families. Addressing these patients' medical needs is a major component of the global programme to eliminate lymphatic filariasis (GPELF). In the 20 y of providing a minimal package of care many thousands of surgical operations to correct LF hydrocoelees been performed and national programmes in >90% of LF endemic countries have received the training needed to care for their patients. The creation of educational materials detailing appropriate patient care, together with increased funding, have been key catalysts in increasing awareness of clinical LF in recent years. Nevertheless, the implementation of care for these patients has often faced challenges that have led to delays in fully implementing the patient care component of GPELF; these include locating these often stigmatised individuals, maintaining provision of the necessary consumables (e.g. soaps and creams) and maintaining programme support within already overstretched national LF teams. As the LF global programme moves to achieve success by 2030 it will be vital to continue to focus efforts on the care and rehabilitation of those suffering from lymphoedema and hydrocoelees, learning from the experiences of the past 20 y.

Keywords: GPELF, hydrocoele, lymphatic filariasis, lymphoedema.

Introduction

The clinical images of lymphatic filariasis—grossly swollen legs (Figure 1) and enlarged male genitals—have been well known across the world for many years. Prior to the establishment of the global programme to eliminate lymphatic filariasis (GPELF) in 2000, the general understanding of this condition, and its effects on patients and their families, remained largely one of rumour rather than fact. Only a relatively few dedicated care centres and investigators around the world were focused on this disease, covering clinical and chemotherapeutic aspects in India,¹ Haiti^{2,3} and Sri Lanka,⁴ surgery in Ghana⁵ and Brazil,⁶ as well as studies of its immunology, entomology, chemotherapy and pathology in the UK⁷ and the USA.^{8–10} Little was known about the disease in large endemic areas of the world, notably those in Africa.

Although global infection prevalence is now relatively well understood, the actual numbers of people suffering from this condition across the world remains difficult to estimate; it was estimated that when the GPELF started in 2000 there were 17.7 million lymphoedema (LE) cases and 29.9 million hydrocoele cases,¹¹ but this is probably an understandable underestimation. A key factor here is that a majority of those infected do not

present with the classic clinical features and appear to be able to carry the parasite without any apparent adverse effects; it is known, however, that subclinical changes are present in many (and maybe all) infected people.¹ Factors that contribute to the difficulty in assessing LF patient numbers include the varied methodologies used to make these estimates, the fact that endemic areas are often rural, isolated and medically underserved, compounded by the frequent reluctance of patients to be identified. Clinical case numbers in endemic populations have often been estimated,¹¹ albeit crudely, to be approximately 2–6% of an endemic community, and in bancroftian filariasis areas it is common to find twice as many hydrocoele cases as lymphoedema cases. However, it is now clear that this proportion varies considerably with the level of endemicity, the methodology used to access these cases and, importantly, the infecting filarial species, because *Wuchereria bancrofti* induces clinically evident hydrocoelees whereas *Brugia* species do not.¹²

The major approach to treating LF-induced lymphoedema patients has been, and remains, hygiene care of the affected skin (i.e. careful regular washing) and limb care (i.e. physiotherapy); secondary infections are an important contributor to the ongoing condition. Correction of hydrocoelees requires a comparatively

Table 1. The minimum package of care (MPC) recommendation with the WHO for every person with lymphoedema and/or hydrocoele*

	Component*	Notes
i.	MDA or individual treatment to destroy any remaining adult parasites and microfilaria	Provision of ivermectin or diethylcarbamazine and albendazole
ii.	Surgery for hydrocoele (in <i>W. bancrofti</i> endemic areas)	Surgeries often carried out in camps, in regular hospital settings; important to include in the national health system.
iii.	Treatment for episodes of adenolymphangitis (ADL)	Provision of supportive treatments (e.g. antihistamines, antipyretics)
iv.	Management of lymphoedema to prevent both progression of disease and episodes of ADL	Regular skin and foot hygiene procedures (e.g. regular washing, wound care), basic physiotherapy

*https://www.who.int/lymphatic_filariasis/managing-morbidity/en/.



Figure 1. A Tanzanian villager affected with bilateral lymphoedema as the result of being infected with *Wuchereria bancrofti*.

standard surgical intervention in most cases, although many of these patients are unwilling to undergo, or able to afford, these operations; medical services in many endemic communities do not prioritise such elective surgeries.¹³

The global LF patient care programme

In 1997, the WHO approved GPELF as a public health issue.^{14,15} Three specific patient care activities must be included in a

country's final dossier report: first, knowing the disease burden, second, providing access to a minimum package of care (MPC; Table 1) and, third, ensuring that this MPC is of adequate quality and that it is sustainable. An additional component for success is the provision of continuing care after GPELF ends for those who need long-term medical support (Table 2); the major emphasis is on including care for LF patients in a country's national primary health system activities as part of a move towards universal healthcare (UHC). Major progress has been made in breaking transmission through mass drug administration (MDA), however, the provision of accessible essential care to those with clinical disease (officially known as morbidity management and disability prevention [MMDP]) still requires attention in many endemic countries. An important target for countries is to achieve 100% geographic coverage of availability of MPC. It should be noted that 100% coverage in this context is often defined as coverage of all LF endemic areas; however, the definition should include the whole country as LF clinical cases are often present in areas where MDA is not being carried out, including major urban areas.

A major purpose behind the need to acquire patient numbers and locations, other than for statistical identification and advocacy, is to identify where the necessary medical services should be placed so as to enable these individuals to gain access to essential care (e.g. adequate oversight from health workers trained in treating LE, local hydrocoelelectomy surgery camps).^{16,17} New approaches have been used to obtain the burden of LF patients including digital methods^{18,19} and the use of local clinics; in general, it has been found that in many countries an essential route to locating patients is via local health workers.^{17,20}

The importance of clear messaging about the infection and availability of MMDP is central to successfully implementing care for those in need. Information that advises patients on the cause of their condition, the availability of help, clear instructions on how to carry out self-care and how to access surgery are vital to success. Communication with the endemic community as a whole is also essential; the visible provision of care to a community's patients is known to enhance the overall coverage of MDA.¹⁹ Better understanding of the condition and its causes helps to reduce the stigma that virtually all patients experience. LF patient

Table 2. Essential requirements for national success in GPELF

	Component	Approach	Outcome
i.	Knowing the burden of LF patients	Using different means	Defining optimal locations for LF care activities/services
ii.	Providing access and availability of basic lymphoedema and hydrocoele care	Training of providers and patients	Self-care for LE patients
		Supply of needed resources (e.g. guidelines, assessment tools)	Hydrocoelelectomy camps
		Appropriate supportive supervision and oversight	Increased MDA coverage
		Advocacy in endemic areas	
iii.	Ensuring the basic care is appropriate quality	Appropriate instruction and oversight	Clinical improvements in lymphoedema
		Assessment of quality of the care being provided (essential for validation)	Successful surgeries
iv.	Ensuring long-term provision of care	Integrate with main national health services (e.g. in the primary healthcare system)	Provision of care for patients with persistent clinical changes
			Identifies lymphoedema care and hydrocoelelectomy surgery as important components of UHC

care groups have been used successfully to assist lymphoedema patients in maintaining their treatment and to provide them with support from others who are similarly affected.²¹

For hydrocoeles, most national programmes in *W. bancrofti* endemic areas have found that providing surgery for hydrocoele repair, often as collective surgical events in surgical camps, has been an easier form of LF patient care to provide due to the shorter duration of implementation compared with that needed for LE care; a surgical intervention (i.e. the number of surgeries carried out) is also a more distinct quantitative indicator for programme reporting purposes. Surgical camps are extremely useful for reducing a backlog of cases but they are also important for countries to build local capacity to ensure that surgical services are available locally for future cases. The importance of carrying out these surgeries with appropriate presurgery and postsurgery procedures and operative practice has been emphasised by the WHO.²²

For lymphoedema, the use of the MPC has been shown to be an important step in improving LF lymphoedema.^{23,24} However, the issue of sustainability of care for those who have extensive limb changes and additional medical complications such as diabetes, hypertension and/or obesity remains an important consideration for national programmes.^{20,24} These cases are likely to need long-term care that eventually will require national health service support. Thus it is vital that LF programmes move to integrate with regular government-provided services.¹⁶

The challenge that LF programmes usually face in implementing their MMDP can be summarised as: Providing sustainable care to stigmatised individuals, often living in low-income settings and frequently distant from medical services, for an often misunderstood, non-life threatening, chronic clinical condition. Many of the specific challenges are listed in Table 3. One reason why some

national programmes have been more successful is that they have managed to adequately inform communities and LF patients that, in addition to MDA, a MPC will also be provided for those affected.^{19,20} However, in many cases, countries are unable to provide these community medical services.

Achievements to date

Key strategic factors in the successes achieved to date in providing MPC within GPELF have been (1) the availability of simple and effective strategies to medically manage LF lymphoedema and hydrocoeles, and (2) a definition of achievable, practical requirements (Table 2) for national success in achieving validation of the elimination of LF as a public health problem. These strategies have been shown to be cost-effective²⁵ and achievable by countries, and indeed now over 18 countries have achieved the validation of elimination which required implementation of MMDP. The impact of the use of the MPC on lymphoedema patients has been personally dramatic to those affected^{20,24} and has, for example, reduced the incidence and severity of the debilitating acute attacks in the majority of patients, thus improving their quality of life and well-being significantly. Many cases of lymphoedema, especially those of lower grades of severity, have also seen significant reductions in their lymphoedematous condition.

Arguably, the most noticeable impact the MMDP activities have upon the disease is in the large number of hydrocoelelectomy cases that have successfully been treated in *W. bancrofti* endemic areas and that these operations have been carried out under standard quality guidelines.^{22,26} Many thousands of hydrocoelelectomies have now taken place as part of GPELF,

Table 3. Major challenges facing national programmes in developing and sustaining their lymphatic filariasis MMDP activities

Issue	Factors	Notes
Locating patients	LF patients are often reluctant to be identified	Important to provide community-wide information about the clinical care available for LF patients
Estimating the number of LF cases	Diagnosis depends on only clinical signs and symptoms that are limited in specificity	There is currently no confirmatory laboratory test for LF clinical disease
Sustainable supply of needed materials	LF patients often cannot afford the material of access (e.g. antifungal creams)	Requires continuing donations from external agencies
Funding for MMDP activities	Variable international funding for specific MMDP activities	Important to maintain advocacy and positive results to funding agencies and the wider community
Management issues	LF programmes often focus on MDA rather than MMDP	Important to explain the need for MMDP to national programmes
The need for sustained MMDP	Overworked NTD programmes	Must be addressed during LF programme planning
Patient access to care facilities	Transport difficulties and distances from healthcare centres	Important to train local healthcare workers to support patients
Achieving 100% geographic coverage with MPC	This is major challenge for many countries and requires special attention as programmes move to UHC	Many countries have only managed to implement MMDP activities in small demonstration projects rather than at scale over an extended period of time

Table 4. Major global achievements in the MMDP component of GPELF

Activity/event	Examples
Has highlighted the needs of LF patients globally	Seen in survey outcomes in many endemic countries
Extensive production and release of MMDP informational, training and advocacy material	WHO tool kit for MMDP, development of surgical practice dummies for hydrocoelectomy
Training sessions held throughout most of the endemic regions	Regional and country-focused sessions by WHO/ESPEN and NTD/LF support centres
Increase in international group discussion forums	DMDI cross-cutting committee of the NNN organisation
Major increase in hydrocoelectomy operations	Training sessions and surgery camps in many countries
Major increase in self-care by lymphoedema patients	Seen in countries with strong MMDP programmes (e.g. Bangladesh, Brazil, India)
Increase in research into holistic approaches to MMDP	Widening of care and rehabilitation issues for LF (e.g. mental health, re-employment support, dermal care)
Major increase in publications related to LF MMDP	Doubling of LF-related publications in the last 10 y
Integration with other NTD conditions	Podoconiosis and LF studies in Ethiopia; leprosy and LF training in Nepal

although, due to inadequate reporting, the exact number performed remains hard to retrieve. Studies have also shown the positive personal impact these surgeries have had on patients and underscore the fact that this is a widely appreciated and important component of MMDP activities²⁷ (Table 3). National programmes in >90% of LF endemic countries have received training in caring for lymphoedema patients and many countries have successfully implemented pilot lymphoedema programmes in limited areas; however, the ultimate goal of 100% geographic

coverage in the provision of MMDP in all endemic countries has still to be achieved. Importantly, a growing number of countries have expanded or established national centres for LF patient care, training and investigation, for example, in Kerala (India), Leogane (Haiti), Bamako (Mali), Kumasi (Ghana), Recife (Brazil), Dar es Salaam (Tanzania) and Dhaka (Bangladesh); these centres provide a highly useful experience for these countries as they develop their expanded national MMDP activities.

Table 5. Major needs for reaching 2030 successfully with lymphatic filariasis MMDP activities

Specific goal	Activities and issues	Advantage
Achieve the WHO dossier requirements	Increase national activities in MMDP in many countries	Is required for a country's eventual success in LF elimination validation
Reach 100% geographic coverage with MMDP	Increase national activities in MMDP	A dossier requirement
Improved data collection related to MMDP	Data recording	Improved reporting and availability of data for advocacy and dossier completion
Ensuring adequate medical care for chronic and serious LE patients	Better triage for the clinically difficult cases	Addresses UHC and sustainable development goals issues
Increase funding for MMDP	Advocacy and clear presentation of the successes	Addresses an important gap in programme needs
Empowerment of community healthcare providers through training and support	Increase the range of activities where HW can assist	Strengthens the health system
Continue focus on hydrocoelelectomy campaigns	Reducing the final cases of hydrocoele	Achieves a successful dossier
Increased advocacy for the success of MMDP	Awareness by the community of the availability of medical care	Improved MMDP coverage
Continue to investigate ways to improve LE care	Research into new systemic and topical agents	Improved care
Increase availability of needed supplies	Supply ADL drugs, soaps and creams, ensure a clean water supply	Improve care for all affected LF patients
Accurate figures as to the numbers of LF patients receiving form GPELF	Improve reporting of MMDP activities by countries	Important to demonstrate the success of the programme through data related to patient care

An important advance in the care of LF hydrocoele patients is recognition by the World Bank's disease control priorities of hydrocoelelectomy as one of the 28 essential surgeries that should be made available in primary health facilities.²⁶ Another positive move in recent years has come through interactions between LF clinicians and researchers with their counterparts from other endemic disease. The field training of leprosy care workers so that they are also able to provide care for LF patients in their villages has also been successful,²⁸ and similarly with podoconiosis lymphoedema programmes and LF teams in Ethiopia.²⁹ The participation of LF in international discussions with other neglected tropical disease skin disease care providers has been mutually beneficial to those involved and has helped maintain a high profile for LF MMDP. An additional important success in recent years has been the increase in funding from major donors for MMDP activities, for example, funding for LF surgery from Norway (health and development international), as well as for programmatic development of surgeries and lymphoedema care from the UK (department of international development) and the USA (United States Agency for international development and the END Fund).

Research into various aspects of LF care has increased and the number of papers focusing on LF patient care in the last 10 y is double the total published in the previous decade. Areas of current research focus include studies of new antibiotic approaches: for example, doxycycline is being considered for its potential to reduce lymphoedema^{30,31}; this multicentre trial is using new digital technology for assessing the size of lymphoedema.³² Other

studies underway range from the use of thermography to monitor acute filarial attacks to understanding and treating the mental health needs of patients.³³

Reaching success by 2030

The experiences of the past 20 y have shown that there are clearly some issues still to be addressed if the goal of GPELF completion by 2030 is to be achieved (Table 5). Other than the obvious—the provision of adequate funding and continuing advocacy at national ministerial level and also with donors concerning the necessity of MMDP for GPELF success—arguably one of the most important actions is to ensure that the implementors of national programmes understand how to carry out the required MMDP activities. This has become more necessary as countries move closer to being successful in breaking the transmission of infection. In parallel, there is a need now more than ever to increase international support for LF MMDP activities. To reach success by 2030 it will be important to focus support upon those countries that are having difficulty in implementing MMDP programmes and to specifically assist them with the more complicated of the two care activities, namely, support for those suffering from lymphoedema. Many hydrocoele cases still occur in bancroftian filariasis areas and this must also be attended to if GPELF is to eventually achieve an adequately high level of success.

Many of the issues that, if addressed, will aid the MMDP component of GPELF to reach success by 2030 are listed in Table 5. Among the most important of these are the need (1) to assist endemic countries to reach full countrywide provision of MPC, and (2) to integrate care for patients into national health services, especially for those who need long-term (indeed life-long) care. It is also important to recognise how MMDP for LF is closely aligned with many other current global health initiatives such as global surgery, and WASH (WATER, Sanitation and Hygiene) and UHC; these global links can be used to enhance the progress to success with GPELF.

Although not specifically included in the GPELF dossier requirements, it will also be important to continue to improve the menu of care, and importantly the support for rehabilitation provided to LF patients. Important advances are likely to come as investigators explore mental health³³ and social aspects, develop new skin care therapies and gain a better understanding of the role of systemic agents such as antibiotics.³¹ More versatile ways of assessing the success and impact of MMDP activities, including direct assessment of clinical and well-being improvements in patients, will also most likely provide benefit to the overall success of GPELF. One specific area that is a challenge, and which will become a greater challenge in the final stages of GPELF, is the provision of appropriate (usually long-term) care for the most affected and debilitated LF patients and the most serious lymphoedema cases, many of whom have comorbidities. These patients are always seen by the public as representing the dominant 'image of disease' and thus it is important to actively provide them with care and not neglect them.

Implementing a national programme to provide care for a condition that is not commonly considered to be an acute or life-threatening presents a challenge in terms of financial costs and utilisation of medical staff. Ensuring support at ministerial level for the overall goal of 100% geographic coverage of endemic countries with LF MMDP services is essential for programmatic success.

Conclusion

The GPELF has brought clinical filariasis into a much clearer global focus and, although there is still much to be learned, major steps in our understanding of the physical, psychosocial and economic burden of LF have been achieved since it began. Increased efforts to provide both hydrocoele surgeries and lymphoedema/acute filarial attack treatments over the next decade are needed to ensure that current successes continue and, importantly, to ensure that both existing LF patients and any de novo cases are provided with continual quality care for as long as necessary.

Finally, it is key to emphasise that although the breaking of transmission of infection is a tremendous achievement for each endemic country, it is vitally important not to let this most laudable of epidemiological goals overshadow other aspects of MMDP in GPELF. The complete success of the programme involves both elements of the plan. A central reason for the original establishment of GPELF was the existence of LF patients, thus ultimate programmatic success can be defined as the absence of any new LF patients and the improved well-being of the remaining patients.

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