Acta Tropica 135 (2014) 86–95

Contents lists available at ScienceDirect

Acta Tropica

journal homepage: www.elsevier.com/locate/actatropica

Review

Lymphatic filariasis and onchocerciasis prevention, treatment, and control costs across diverse settings: A systematic review

Joseph Keating[a,b,*], Joshua O. Yukich[a,b], Sarah Mollenkopf[b], Fabrizio Tediosi[c,d,e]

[a] Center for Applied Malaria Research and Evaluation, Tulane University School of Public Health and Tropical Medicine, 1440 Canal Street, Suite 2200, New Orleans, LA 70112, United States
[b] Department of Global Health Systems and Development, Tulane University School of Public Health and Tropical Medicine, 1440 Canal Street, Suite 2200, New Orleans, LA 70112, United States
[c] Department of Public Health and Epidemiology, Swiss Tropical and Public Health Institute, Socinstrasse 57, 4001 Basel, Switzerland
[d] University of Basel, Switzerland
[e] Centre for Research on Health and Social Care Management (CERGAS), Università Bocconi, Milan, Italy

ARTICLE INFO

Article history:
Received 7 December 2013
Received in revised form 21 March 2014
Accepted 23 March 2014
Available online 1 April 2014

Keywords:
Onchocerciasis
Lymphatic filariasis
Cost
Treatment
Control

ABSTRACT

The control and eventual elimination of neglected tropical disease (NTD) requires the expansion of interventions such as mass drug administration (MDA), vector control, diagnostic testing, and effective treatment. The purpose of this paper is to present the evidence base for decision-makers on the cost and cost-effectiveness of lymphatic filariasis (LF) and onchocerciasis prevention, treatment, and control. A systematic review of the published literature was conducted. All studies that contained primary or secondary data on costs or cost-effectiveness of prevention and control were considered. A total of 52 papers were included for LF and 24 papers were included for onchocerciasis. Large research gaps exist on the synergies and cost of integrating NTD prevention and control programs, as well as research on the role of health information systems, human resource systems, service delivery, and essential medicines and technology for elimination. The literature available on costs and cost-effectiveness of interventions is also generally older, extremely focal geographically and of limited usefulness for developing estimates of the global economic burden of these diseases and prioritizing among various intervention options. Up to date information on the costs and cost-effectiveness of interventions for LF and onchocerciasis prevention are needed given the vastly expanded funding base for the control and elimination of these diseases.

© 2014 Elsevier B.V. All rights reserved.

Contents

* Corresponding author at: Center for Applied Malaria Research and Evaluation, Tulane University School of Public Health and Tropical Medicine, 1440 Canal Street, Suite 2200, New Orleans, LA 70112, United States. Tel.: +1 504 988 1348; fax: +1 504 988 3653.
E-mail addresses: jkeating@tulane.edu (J. Keating), jyukich@tulane.edu (J.O. Yukich), smollenk@tulane.edu (S. Mollenkopf), fabrizio.tediosi@unibas.ch (F. Tediosi).

http://dx.doi.org/10.1016/j.actatropica.2014.03.017
0001-706X/© 2014 Elsevier B.V. All rights reserved.

1. Introduction

Despite renewed interest in the prevention and control of neglected tropical disease (NTD), lymphatic filariasis (LF) and onchocerciasis continue to cause widespread disease and disability in many parts of the world. LF is a leading cause of permanent and long-term disability, with approximately 40 million people either disabled or incapacitated by the disease; the risk of infection spans 73 countries, with the largest burden in Africa and South Asia (WHO, 2013; Simonsen, 2009). Onchocerciasis is endemic in 31 countries in Africa, 6 countries in Latin America and in Yemen; 38 million people are estimated to be currently infected, with 99% of cases found in Africa (WHO, 2013).

Financing and support for NTDs in general is on the rise (Zhang et al., 2010; London Declaration to Combat NTDs, 2013). The United States of America (USA) committed US$350 million to provide LF treatment in 2008; in 2012 the U.S. government committed an additional US$89 million to prevent and control NTDs, including LF and onchocerciasis. The United Kingdom committed £50 million over 5 years toward NTD control and elimination (Zhang et al., 2010), and recently the Bill and Melinda Gates Foundation awarded a US$34 million grant to leverage or develop new mechanisms to generate funding for NTD control and elimination (Zhang et al., 2010). In 2012, the London Declaration on NTDs was held to accelerate progress toward achieving the WHO 2020 targets toward eliminating several NTDs, including LF and onchocerciasis. Since 2012, partners and donors have contributed over US$785 million to support NTD programs, strengthen research and development mechanisms and bolster drug availability and distribution (London Declaration to Combat NTDs, 2013).

Financing for the control and elimination of LF through the Global Program for the Elimination of LF (GPELF) mostly comes from private organizations such as the Bill and Melinda Gates Foundation, as well as corporations such as Merck, Eisai, and GlaxoSmithKline. All three drugs used during mass drug administration (MDA) are donated: albendazole by GlaxoSmithKline, diethylcarbamazine (DEC) by Eisai Co. Ltd., and Mectizan (ivermectin) by Merck and Co. Inc. Additional funding for the elimination of LF comes from bilateral and multilateral organizations, NGOs, and national health budgets (London Declaration to Combat NTDs, 2013).

The majority of support for onchocerciasis treatment is currently provided in kind by Merck and Co. Inc.; Merck has donated more than 1.5 billion doses of ivermectin since the inception of the Mectizan donation program (MDP) (Ogoussan and Hopkins, 2011; Thylefors, 2008). Financial management for the African Program for Onchocerciasis Control (APOC) is carried out through the World Bank; the World Bank manages the APOC trust fund and the coordination with national onchocerciasis elimination committees, who determine local planning and financial needs. While direct cost recovery from the community has largely been abandoned as an approach to financing the Community Directed Treatment (CDTi) program, current discussion revolves around integration of the CDTi program into existing health structures and developing financing through the national health system of each country involved. The APOC program is proceeding toward curtailing activities and transitioning to local ownership by 2015. A major challenge during any transition is potential funding gaps as programs scale up (Rakers et al., 2009; London Declaration to Combat NTDs, 2013). Previously, it was suggested that key to a successful transition would be the development of private–public partnerships to finance and coordinate strategies (Benton et al., 2002; Blanks et al., 1998; Dadzie, 1998; Miri, 1998; Mutabazi and Duke, 1998; Okwero, 1998), although this may no longer be relevant as health systems strengthen, and partners and pharmaceutical companies renew their pledge to eliminate many NTDs (London Declaration to Combat NTDs, 2013).

The purpose of this paper is to review the existing literature on the costs, economic impact, and health systems implications of LF and onchocerciasis. The paper begins with a brief description of the treatment, prevention and control strategies for the two diseases to provide context. It then presents a systematic review of literature that included primary data on costs or cost-effectiveness related to LF and onchocerciasis programs.

1.1. Prevention, treatment and control of LF

The main strategy for interrupting LF transmission is annual MDA in endemic areas. Secondary activities focus on vector control (*Culex* genus in urban settings, and species within the *Anopheles*, *Mansonia*, or *Aedes* genus in rural settings). The main strategy for alleviating the disability resulting from LF infection focuses on preventing or reducing the severity of secondary fungal and bacterial infection.

DEC is the drug of choice for patients with active LF, given that it is both micro- and macro-filariacidal. Ivermectin is also efficacious against microfilariae of LF but not adult worms, but is only used where onchocerciasis is also present and loaiasis (infection caused by *Loa loa*, the African eye worm) is absent. Albendazole has also been used in combination with DEC and ivermectin; given its generalized anti-helminthic properties the addition may increase compliance of MDA against LF (Remme et al., 2006). However, trials are still underway to quantify any added benefit of using albendazole in combination with DEC. A study in south India suggests that this combination therapy has an added benefit in reducing the prevalence of angioedema (Rajendran et al., 2002) and a study in Nigeria showed that the use of albendazole in combination reduced mosquito infection rates (Richards et al., 2005). A second line of defense is the use of doxycycline against *Wolbachia* bacteria; this drug stops embryogenesis and results in increased death rates of adult worms over a 12 month period (Eddleston et al., 2011).

Studies have suggested that prolonged vector control can contribute to LF elimination (Ramaiah et al., 1994), although it is now widely accepted that vector control should complement

Download English Version:

https://daneshyari.com/en/article/3393824

Download Persian Version:

https://daneshyari.com/article/3393824

Daneshyari.com