Defining and Defeating the Intolerable Burden of Malaria

III. Progress and Perspectives

Introduction

Roger I. Glass* and Anthony S. Fauci

Fogarty International Center and National Institute of Allergy and Infectious Diseases, National Institutes of Health, Bethesda, Maryland

This welcome supplement to the Journal brings together a wealth of new information on the diagnosis, treatment, epidemiology, and prevention of malaria. The articles, many of which have been authored by researchers from developing countries, highlight the extraordinary advances made in malaria research and public health practice. Both disciplines are required to address this continuing scourge that exerts its toll primarily on young children and pregnant women in sub-Saharan Africa, causing more than one million deaths each year. As a result of recent research, we now have new drugs—artemisinin-based combination therapies (ACTs)—that are highly effective in treating the disease; new and rediscovered vector control strategies including long-duration, insecticide-treated bed nets (ITNs) and indoor residual spraying of homes with insecticides (IRS); and a widening pipeline of promising vaccine candidates, some of which have demonstrated partial efficacy in clinical trials. Most importantly, there is new resolve and commitment by the international community to recognize the importance of malaria and to confront it with fervor and funding.

Several recent malaria-focused initiatives promise to go far beyond past efforts that proved to be inadequate. For example, the Multilateral Initiative on Malaria (MIM), which was launched in 1997, aims to maximize the impact of scientific research on the control of malaria; wisely, leadership training in malariology is a key component of MIM. The Malaria Vaccine Initiative began in 1998 and is a Bill & Melinda Gates Foundation-funded project to accelerate development of malaria vaccines. The Global Fund for AIDS, Tuberculosis, and Malaria followed in 2002 and the World Bank’s Malaria Global Strategy and Booster Program started in 2005. In addition, the U.S. President’s Malaria Initiative (PMI) has added $1.2 billion to introduce IRS, ITNs, antimalarial drugs, and treatments to prevent malaria in pregnant women in target areas in Africa. Each of these programs has contributed to reductions in malaria-associated morbidity and mortality. Most recently, Bill and Melinda Gates issued an audacious challenge to eradicate malaria altogether.

These announcements come none too soon. In August 2007, one of us (RIG) had the opportunity to visit several African countries and witness the progress of the President’s Malaria Initiative. On Zanzibar, a scenic island off the coast of Tanzania, a successful program in action was observed. Zanzibar has a long history of dealing with a huge burden of malaria and an under-funded control program. Many teams of health workers were seen heading out to conduct indoor residual spraying of all the homes on the island, an activity being conducted twice a year. ITNs were being distributed to all homes, and ACT was being made available to children with the shaking chills and fevers of malaria. The impact was profound: a nearly complete reduction in the incidence of malaria on Zanzibar in a period of little more than a year. As this victory was celebrated over lunch, the Health Minister of Zanzibar thanked the group for supporting his program. He then commented on our surprise, noting that while he was delighted with this massive public health intervention for malaria, this was not the first but the third time that malaria had been controlled in Zanzibar. He described a previous program in the late 1950s, when the World Health Organization (WHO) controlled malaria using dichlorodiphenyltrichloroethane (DDT) and disease rates plummeted, only to return with a vengeance when the program was stopped and spraying was halted. In the 1980s, the WHO assisted another national control effort and malaria rates dropped again, yet the disease returned once the program was discontinued. Is the current round of control the third strike or a special opportunity?

The lesson from Zanzibar is the need for program sustainability and endurance, and the recognition that malaria is an unforgiving and relentless foe. Malaria control will never be successful if we declare victory when rates go down and success seems at hand. It will require more than a one-shot boost of pesticides, bednets, and drug treatments. Although Zanzibar is now supported with funds from the PMI, these dollars likely will not be present forever. Sustainability in Zanzibar and elsewhere will require novel solutions to build a funding base to support control programs for the indefinite future. Approaches such as placing an airport or a hotel tax on tourists might be one approach, but other economic solutions are also needed. In Zanzibar, the PMI was set up and supervised by consultants from the United States; however, sustainability will require the training of local staff to continue the scientific and administrative leadership needed to develop and evaluate the strategies and order pesticides, supply bed nets, and replenish the supplies of drugs. National epidemiologists will be needed to monitor the program and look for outbreaks of disease that might indicate growing resistance of Anopheles to insecticides or of Plasmodia to the drug regimens. Concomitantly, health providers will need to upgrade their skills in diagnosis and patient management.

Although many think that malaria is a problem that has always been confined to poor tropical countries, a century ago, Boston and Washington were hotbeds of malaria in the summer. The Centers for Disease Control and Prevention in Atlanta got its start as the malaria control agency of the U.S. Public Health Service and was deliberately located in a focus of active transmission. One of the first directors of the Na-
tional Institutes of Health, Dr. James Shannon, was a prominent malaria drug researcher. While endemic malaria has been eliminated in the United States, more than one thousand cases are imported each year by travelers returning from endemic areas and the occasional mini-outbreak occurs with local transmission.

The new focus of attention on malaria and the unprecedented infusion of resources provide great hope that research can provide us with improved control programs. This mandates the discovery of new drugs and safer insecticides, and a safe and effective vaccine. We are encouraged by the substantial progress made to date. However, we must provide for sustainability of effort and for training the next generation of public health specialists and researchers in malaria control, including laboratorians, clinicians, epidemiologists, entomologists, information technology specialists, economists, and social scientists. The recent challenge of the Bill & Melinda Gates Foundation to eradicate malaria is a call to arms, but success will not be achieved overnight. It will take a unified effort. We salute the many investigators contributing to this volume who represent many of the leaders in this extraordinary endeavor.