

EDITORIAL

Lymphatic filariasis in Papua New Guinea

Bancroftian filariasis affects approximately 120 million residents of tropical and subtropical areas of the world. Many more people are at risk of this helminthic infection as breeding sites and habitats of the obligatory mosquito vector spread coincident with increased human population density and other environmental changes that result from human activity. Although filariasis does not appear to be a direct cause of mortality, it can lead to acute and chronic disease manifestations that are disabling from the personal as well as societal perspective. The initial clinical manifestations of bancroftian filariasis usually appear during adolescence. They most commonly include acute adenolymphangitis, a syndrome characterized by the rapid appearance of swelling of the lymph nodes draining the lower or upper extremity with fever and other signs of systemic illness. The duration of illness is several weeks, with slow resolution. These signs and symptoms may recur repeatedly, especially in areas where transmission intensity is high. In some individuals, chronic swelling and disfigurement of the limbs (elephantiasis) or breast may develop. In men, hydrocele and thickening of the vas deferens are prominent. These presumably are due to anatomical or functional obstruction of lymphatic vessels draining the male genitalia. It is not yet clear what accounts for the variability in susceptibility of individuals to develop acute or chronic disease. From the social and economic perspective, studies from several endemic areas of the world have documented the importance of lymphatic filariasis as a major contributor to economic loss and social ostracism.

The focus of this issue of the journal is on bancroftian filariasis in Papua New Guinea. This series of articles comes at an opportune time since much of the recent knowledge on the pathogenesis and approaches to control of bancroftian filariasis is a result of work conducted in Papua New Guinea. From the perspective of disease pathogenesis and the contribution of host immunity, King describes the interesting finding that transmission

intensity and not static infection status is a major determinant of the nature and strength of T-cell responses to filarial parasites (1). This observation is the first of its kind and clearly raises the possibility that the degree of exposure to mosquitoes bearing infective larvae contributes to the heterogeneity of disease manifestations observed in different endemic areas of Papua New Guinea and other filariasis-endemic areas of the world. Using the tools of epidemiology and biostatistics, Melrose and coworkers (2) and Alexander (3) comment on the prevalence of infection and disease due to *Wuchereria bancrofti* throughout the country. Among the filariasis-endemic areas of the world, Papua New Guinea is known to have among the highest prevalences. The major vector in Papua New Guinea, *Anopheles punctulatus*, also transmits malaria. This situation is unusual compared to urban areas of Asia, such as in India, where culicine mosquitoes are vectors. It is, however, similar to the situation in many rural areas of Africa, so it is possible that the lessons learned from one area may be relevant to the other.

Papers by Bockarie and coworkers (4-6), Selve and coworkers (7), Hii and coworkers (8), and Sapak and coworkers (9), address the extremely important issue of the control of bancroftian filariasis at the population level. Work by these authors and others in Papua New Guinea has clearly demonstrated the feasibility of control through the use of simple, safe and relatively inexpensive mass chemotherapy using diethylcarbamazine, ivermectin and/or albendazole. Although the optimal drug combination remains to be defined, these studies clearly demonstrate that transmission intensity can be reduced by annual or semi-annual doses of antifilarial medication given to all or most residents of a given endemic area. If the goal in this situation is to rid large areas of the country of filariasis, the challenge here will be to distribute the drugs to as many people as possible. This will by necessity include persons without clinically apparent disease, including children. Health planning authorities will need to address

multiple issues to achieve such a goal, including the widespread acceptability of treatment with ‘added on’ benefits, such as the antiscabitic activity of ivermectin (10), and intense community participation, even in remote rural areas. These ‘translational’ and implementation issues will need to proceed hand-in-hand with additional research that will address the duration of therapy necessary to prevent re-emergence of transmission.

The series of articles in this issue of the journal reflect the impressive state of clinical, epidemiological and ecological work conducted on the problem of lymphatic filariasis in Papua New Guinea. The time is near to translate this commendable effort and research success to control the disease on a national scale. With the financial and organizational backing of international programs to control bancroftian filariasis, it is hoped that the health of the citizens will ultimately be improved.

James W. Kazura

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REFERENCES

1 **King CL.** Human immune responses to lymphatic filariasis in Papua New Guinea. *PNG Med J* 2000;43:203-212.
2 **Melrose W, Pisters P, Turner P, Kombati Z,**

Selve BP, Hii J, Speare R. Prevalence of filarial antigenaemia in Papua New Guinea: results of surveys by the School of Public Health and Tropical Medicine, James Cook University, Townsville, Australia. *PNG Med J* 2000;43:161-165.
3 **Alexander NDE.** *Wuchereria bancrofti* infection and disease in a rural area of Papua New Guinea. *PNG Med J* 2000;43:166-171.
4 **Bockarie MJ, Ibam E, Alexander NDE, Hyun P, Dimber Z, Bockarie F, Alpers MP, Kazura JW.** Towards eliminating lymphatic filariasis in Papua New Guinea: impact of annual single-dose mass treatment on transmission of *Wuchereria bancrofti* in East Sepik Province. *PNG Med J* 2000;43:172-182.
5 **Bockarie MJ, Jenkins C, Blakie WM, Lagog M, Alpers MP.** Control of lymphatic filariasis in a hunter-gatherer group in Madang Province. *PNG Med J* 2000;43:196-202.
6 **Bockarie MJ, Hii JLK, Alexander NDE, Bockarie F, Dagoro H, Kazura JW, Alpers MP.** Mass treatment with ivermectin for filariasis control in Papua New Guinea: impact on mosquito survival. *Med Vet Entomol* 1999; 13:120-123.
7 **Selve BP, Bwadia S, Misa M, James K, Usurup JP, Turner P, Melrose W, Yad W, Samuel R, Eddie C.** Community empowerment in the control of lymphatic filariasis in Misima, Milne Bay Province using diethylcarbamazine in combination with albendazole. *PNG Med J* 2000;43:183-187.
8 **Hii J, Bockarie MJ, Flew S, Genton B, Tali A, Dagoro H, Waulas B, Samson M, Alpers MP.** The epidemiology and control of lymphatic filariasis on Lihir Island, New Ireland Province. *PNG Med J* 2000;43:188-195.
9 **Sapak P, Williams G, Bryan J, Riley I.** Efficacy of mass single-dose diethylcarbamazine and DEC-fortified salt against bancroftian filariasis in Papua New Guinea six months after treatment. *PNG Med J* 2000;43:213-220.
10 **Bockarie MJ, Alexander NDE, Kazura JW, Bockarie F, Griffin L, Alpers MP.** Treatment with ivermectin reduces the high prevalence of scabies in a village in Papua New Guinea. *Acta Trop* 2000;75:127-130.