Malaria: Continues to be a Scourge

Maj Gen SR Mehta, vsm*

MJAFI 2007; 63 : 102-103

Malaria currently kills more than a million people every year worldwide. About 90 % of the deaths occur in Sub Saharan Africa and most of them are in children. *Plasmodium falciparum* (pf), the most virulent malarial parasite is responsible for maximum number of deaths [1]. The story is much the same in our subcontinent, with yearly reported 1.84 million cases and more than a thousand deaths. Vector resistance to insecticides and parasite resistance to drugs are the major areas of concern. These are compounded by pitfalls in diagnosis and management. Diagnosis is often not considered, delayed and superimposed complications are ignored. Yet the disease is eminently treatable and highly preventable. A relatively recently identified problem is flooding of the markets with spurious and poor quality artemisinin compounds.

Malaria control requires integrated approach comprising prevention including vector control and treatment with effective antimalarials. Insecticide treated bed nets can reduce infection rate but cannot eliminate malaria from the endemic areas. Young children who have not had the time to develop immunity to the parasite and pregnant women who are not immune to receptors expressed by the pf that allows it to lodge in the placenta, are especially vulnerable to the disease.

Early diagnosis and prompt treatment with effective antimalarials has a very important role to play in reducing severe malaria morbidity and mortality. Roll Back Malaria (RBM) strategy was launched in the year 1998 in which the UNICEF, UNDP, World Bank and World Health Organization have joined hands to fight malaria with an aim to reduce substantially the human suffering and economic losses due to the disease. Most victims of malaria come from poorest section of the society and die because they do not have access to health care. Life saving drugs are often not available or are not administered early enough after onset of illness. The strategy of RBM includes prompt treatment with effective drugs, effective use of insecticide treated materials, other vector control methods, intermittent

preventive treatment in pregnancy, emergency and epidemic preparedness and response [2]. The main reason why malaria related mortality has increased while mortality associated with most other treatable and preventable conditions has decreased, is the continued deployment of ineffective anti-malarial drugs in the face of increasing resistance and poor implementation of proven, effective measures to prevent mosquito bites [3]. In the Armed Forces our aim is in consonance with the national objectives as brought out in the National Vector Borne Diseases Control Programme of the Government of India.

Malarial infection during pregnancy, is a major public health problem in tropical and sub tropical regions throughout the world. In endemic areas, pregnant women are the main group of adults at risk of malaria. In pregnant women the disease is most widely evaluated in sub Saharan Africa, where 90 % of global burden of malaria and deaths due to the disease occur. Plasmodium infection during pregnancy increases the chances of maternal anaemia, abortions, still birth, prematurity, intrauterine growth retardation and low birth weight (defined as birth weight < 2500 gm), the greatest risk factor for neonatal mortality [4]. The effects of other three parasites that cause malaria in humans (*P vivax*, *P ovale* and *P malariae*) are less clear. There is paucity of data of malaria in pregnancy from our sub continent. Chawla and Manu [5], in a hospital based observational study observed the importance of high index of suspicion in febrile pregnant patients.

The introduction of artemisinin based combination therapy (ACT) has increased the urgency of improving the specificity of malaria diagnosis, as ACT are indicated only in confirmed cases of malaria. Unfortunately the ground reality is different and the unjustifiable empirical use in practice is going to have a devastating effect in the form of development of artemisinin drug resistance. The two methods in use for parasitological diagnosis are light microscopy and rapid diagnostic tests (RDTs). Rapid, simple, sensitive and specific antibody based

*Senior Consultant (Medicine), Office of DGAFMS, Ministry of Defence, New Delhi 110001.

diagnostic stick or card Immunochromatography tests (ICT) that detect *pf*- lactate dehydrogenase and *pf* histidine rich protein 2 (*pf* HRP2). The advantages of these tests are that it is a one-step procedure, simple, rapid (requires 2-3 minutes) and can be done in field situations. But its reagents are to be stored properly at low temperature. These tests can detect parasitaemia of 0.1% and are potentially useful as markers for clinical malaria in endemic areas. The disadvantage is that they do not quantitate *pf* parasitaemia. As Mishra et al [6], note that the first line investigation is microscopy and ICT is to be resorted in smear negative patients and as initial investigation in desperately ill patients. In spite of newer card and dipstick-based investigations, properly performed peripheral blood smear examination continues to be the gold standard.

Mosquito repellents are proven, effective methods for prevention of mosquito bites [7]. This is widely practiced in the form of insecticide treated bed nets. In this issue, Bhatnagar and Mehta's [8] article on use of mosquito repellent patches on uniform in troops in the North Eastern sector is a step in the same direction. More research is needed in efforts to assess efficacy, implementation and adherence to this practice outside the setting of research studies.

Jaiswal et al [9], emphasise the importance of use of multi pronged prevention, early ICT based diagnosis and prompt treatment of troops who are rapidly mobilised in malarious areas in the North East. This has special relevance to our troops deployed in counter insurgency operations.

With strong commitment, leadership and singularity of purpose that characterised the successful campaign to eradicate small pox, tide of malaria can be stemmed. In armed forces, we have the necessary tools: insecticides, insecticide treated bed nets, good quality and freely available drugs and the necessary medical infrastructure. Dedicated team of specialists, prompt diagnosis and effective treatment can definitely decrease the mortality and morbidity as done in the past [10,11].

An effective and affordable vaccine would be wonderful, but we need not wait for it. Presently the RTS, S/AS02A vaccine is the first that has demonstrated a significant capability to protect human adult volunteers against an experimental infection with the malaria parasite [12]. The new results indicate that the vaccine induces protection against malaria in children one to four years of age in Africa. While much more work on this vaccine is required, this constitutes a breakthrough in malaria vaccine research.

It is time to put our shoulders to the wheel and rededicate ourselves to achieve the above mentioned achievable aims. If we cannot do it, then we just have to look into the mirror to know who is to blame.

References

1. WHO Guide lines for treatment of malaria, 2006.
2. WHO, The Roll Back Malaria strategy to improve the access to treatment through home management of malaria, 2005.
3. Wellems TE, Miller LH. Two worlds of malaria. *N Eng J Med* 2003; 349:1496-8.
4. Brabin BJ. The risks and severity of malaria in pregnant women. In: *Applied field research in malaria*. Report No. 1. Geneva: WHO.1991:1-34.
5. Chawla S, Manu V. Malaria in pregnancy. *MJAFI* 2007; 63:147-8.
6. Mishra MN, Misra RN. Immunochromatographic methods in malaria diagnosis. *MJAFI* 2007; 63: 127-9.
7. Reversal of chloroquin resistance: Malaria in Malawi. *J Watch Infect Diseases* 2006;1:1.
8. Bhatnagar A, Mehta VK. Efficacy of Deltamethrin and Cyfluthrin impregnated cloth over uniform against mosquito bites. *MJAFI* 2007; 63:120-2.
9. Jaiswal P, Srinivasan S, Mehta VK, et al. Malaria on the Move: Ecological consideration for the Armed Forces. *MJAFI* 2007; 63: 112-4.
10. Mehta SR, et al. Falciparum malaria-210 cases. *J Assoc Physicians India* 1986; 34: 119-20.
11. Mehta SR, Naidu G, Chander V, et al. Falciparum malaria – Present day problems and experience with 425 cases: *J Assoc Physicians India* 1989; 139: 264-7.
12. Philipe Van De Parre, Jean Parre. Vaccine Efficacy: Wining a battle (not war) against malaria. *Lancet* 2004; 364: 1380-3.