Malaria in pregnancy

A report in *The Lancet, Infectious Diseases*[1] mentioned that most pregnant women at risk of infection with *Plasmodium vivax* live in the Asia-Pacific region. When women have little immunity, every infection is potentially fatal to the mother, foetus or both. When malaria in pregnancy (MiP) cannot be prevented, accurate diagnosis and prompt treatment are needed to avert dangerous symptomatic diseases and to reduce effects on the foetus. The World Health Organization (WHO) recommendations for the control of MiP are largely based on the situation in Africa, but strategies for the Asia-Pacific region are complicated due to heterogeneous transmission settings, coexistence of multidrug-resistant *Plasmodium falciparum* and *P. vivax* parasites and different vectors. Most of the knowledge related to epidemiology, effect, treatment and prevention of MiP in the Asia-Pacific region comes from India, Papua New Guinea and Thailand[1].

In case of MiP, three questions come immediately to mind: Does pregnancy aggravate malaria and vice versa? Can the available drugs always protect from malarial infection? Does the prevention of infection by antimalarial drugs have an adverse effect on the pregnancy or on the unborn child? Malaria in general, and especially an infection with *P. falciparum*, is more hazardous during pregnancy. Pregnancy appears to interfere with the immune processes in malaria[2], a disease which itself alters immune reactivity. In highly endemic malaria-infested areas, where semi-immune adults usually have substantial acquired resistance to local strains of plasmodia, the prevalence of clinical malaria is higher and its severity greater in pregnant women, especially during the second trimester, and it may cause abortion and premature labour[3].

However, MiP is not recognized as a priority by many governments, policy makers and donors in the Asia-Pacific region and hence robust data for the true burden of malaria throughout pregnancy are scarce. Considering the prominence of the situation, improved estimates of the morbidity and mortality of MiP are urgently needed. The greater part of our knowledge about MiP is derived from studies carried out in tropical Africa, which show differences in the clinical epidemiological pattern of MiP from one endemic setting to another. Systematic studies from malaria-endemic regions in India are lacking, except for those carried out in Chandigarh, Jabalpur (Central India) and Surat (Gujarat), areas that differ in climate, intensity of malaria transmission, use of malaria control measures and socio-cultural attitudes towards the disease. The Central Indian region is of special interest because the population here is exposed to malaria from both *P. vivax* and *P. falciparum*[4].

India's National Vector Borne Disease Control Programme (NVBDCP) reports 1.5–2.0 million malaria cases with approximately 1000 malarial deaths per year. On the contrary, according to WHO estimates India accounts for three-quarter of all malaria cases in Southeast Asia[5]. With approximately 120 million cases of *P. falciparum* malaria in Southeast Asia in 2002, this implies that India may have as many as 90 million cases of *P. falciparum* malaria per year. With almost half of all malaria cases in India attributable to *P. falciparum*, the total number of annual malaria cases in India can be estimated at 180 million. This is a substantially higher estimate than that derived from surveillance data which record only 1.5–2 million confirmed cases per year. With an estimated surveillance sensitivity of 1%, it is clear that national surveillance that relies solely on passive data collection will not be able to capture all malaria cases.

Roll Back Malaria (RBM), a supporting agency of WHO, recommends a three-prong approach to reduce the burden of MiP: effective case management, insecticide-treated nets (ITNs) and intermittent preventive therapy. Close collaboration between malaria control and reproductive health programmes can facilitate development of systematic management protocols and drug-supply strategies. There are several challenges and issues that India faces regarding MiP, which include lack of ITNs, socio-cultural issues, growing resistance to antimalarials and insecticides, a new antimalarial drug policy that has not yet been fully implemented, and a highly centralized malaria control programme.

Current Indian Government policy states that ITNs should be given free to people living below the poverty line in endemic areas. With approximately one-fifth of the Indian population living below the poverty line, it is obvious that a more realistic and defined distribution system must be developed. Increased resistance to antimalarial drugs and insecticides limits the effectiveness of malarial prophylaxis and treatment, inhibits malaria control and results in high morbidity and mortality. The increase in resistance to antimalarial drugs has led to the recent government decision to drastically modify its antimalarial policy in favour of artemesinin-based combination therapy. The Indian Government faces many challenges regarding MiP drug policy and in terms of specific strategies targeting MiP; the new NVBDCP policy recommends chemoprophylaxis for pregnant women in high risk areas. In India, chloroquine (CQ) is the drug of choice for MiP prevention and treatment in places that do not have resistance. Chemoprophylaxis for pregnant women starts during the second trimester and continues one month after delivery. In areas with CQ resistance, a weekly regimen of CQ with supplementation by proguanil is recommended. As the percentage of *P. falciparum* cases continues to increase, CQ is becoming more ineffective.

Prevention and control of MiP is an important and achievable goal. Strategies like creating a framework for scaling up the use of ITNs for both pregnant women and the general population, addressing socio-cultural barriers and tackling the issue of growing resistance by re-evaluating and updating the current drug policy seem feasible solutions in reducing the burden of MiP in India and if effectively implemented, should serve to reduce the incidence of anaemia, placental malaria and low birth weight babies.

1. Marcus, J. R. *et al.*, *Lancet Infect. Dis.*, 2012, **12**, 75–88.
2. Playfair, J. H. L., *Br. Med. Bull.*, 1982, **38**, 153–159.
3. Adams, A. R. D. and Maegraith, B. G., *Clinical Tropical Diseases*, Blackwell Scientific Publications, Oxford, 1980, 7th edn.
4. Singh, N., Shukla, M. M. and Sharma, V. P., *Bull. WHO*, 1999, **77**, 567–572.
5. WHO Regional Office for Southeast Asia, Distribution of reported malaria cases in SEA region. WHO, Delhi, 2004.

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