HIV/malaria co-infection in pregnancy

Co-infection with HIV and malaria presents specific complications for pregnant women and fetal development. HIV lessens pregnancy-specific malaria immunity normally acquired during the first and second pregnancies. Placental malaria is associated with increased risk of maternal anaemia and HIV infection, especially among younger women and those experiencing their first pregnancy. The role of co-infection in mother-to child transmission of HIV is unclear, with some studies reporting an increase and others reporting no change. The potential risks of adverse drug interactions have critical implications for effective management of co-infection, and call for increased research.

Although malaria affects Asia, Latin America and the Caribbean, and sub-Saharan Africa, the largest burden of co-infection lies in Africa, the continent with the greatest burden of malaria, and where more than three quarters of all HIV-infected women live. Variations exist across the African continent. Most affected by HIV/malaria co-infection are the Central African Republic, Malawi, Mozambique, Zambia and Zimbabwe, where some 90 per cent of adults are exposed to malaria and average adult HIV-prevalence surpasses 10 per cent. In parts of southernmost Africa, where the HIV epidemic is most severe, there is a lower incidence of malaria, although outbreaks do occur in particular areas, such as Kwazulu-Natal, South Africa.

Data for other regions are not as clear, but the overlap of infections may be present in the general populations of Belize, El Salvador, Guatemala, Guyana and Honduras – and, to a lesser extent, Brazil. Research indicates that certain populations, such as migrant goldmine workers in Brazil and Guyana, may have greater risk of co-infection. The HIV epidemic is generalized in Asian countries such as Myanmar and Thailand, but malaria transmission is unstable and heterogeneous across this region, as in Latin America and the Caribbean. The most common species of malaria in each region also differs – *P. falciparum* in Africa, *P. vivax* in Asia and Latin America and the Caribbean – and the effects of the disease may vary by the degree of immunity a women has achieved by the time she becomes pregnant. Women in Asia are less exposed to intense malaria transmission and therefore have less opportunity to develop acquired immunity. This is also true of areas of unstable malaria transmission in parts of southern Africa. Most studies of malaria in pregnancy are from Africa, and more are needed from other regions and *non-falciparum* species.

Malaria sufferers with severe anaemia who require blood transfusions, particularly children, also are at higher risk of acquiring HIV. Every year, between 5,300 and 8,500 children in areas of endemic malaria in Africa become infected with HIV from blood transfusions administered for severe malaria.

Regional differences notwithstanding, co-infection affects all pregnant women in similar ways. HIV in pregnancy combined with malaria increases the risk of severe anaemia and reduces any acquired immunity that women living in areas of stable malaria transmission may have developed – effectively meaning that HIV-positive women in their second, third and fourth pregnancies have the same low immunity to malaria as women in their first pregnancy. Pregnant women infected with HIV become twice as susceptible to clinical malaria, regardless of gravidity. In these women, malaria can restrict fetal growth, cause preterm delivery and low birthweight in newborns and reduce the transfer to children of maternal immunities and cellular responses to infectious diseases such as streptococcus pneumonia, tetanus and measles. Recent evidence suggests that HIV-positive mothers with malaria are more likely to have low-birthweight infants; in turn, low-birthweight infants were shown to have significantly higher risks of mother-to-child transmission of HIV compared with infants of normal birthweight.

The effects of malaria on HIV are less clear, though episodes of acute malaria can increase viral load and hasten disease progression. Malaria infection during pregnancy may increase the risk of mother-to-child transmission of HIV in utero and during birth, and higher viral load can result in greater risk of transmission during breastfeeding. Some research shows that viral loads can return to pre-episode levels following malaria treatment, which suggests that management of malaria may be critical to slowing the spread of HIV and its progression to AIDS.

One of the most pressing questions about co-infection concerns drug therapies. The World Health Organization recommends that all pregnant women in areas of high HIV prevalence (>10 per cent) receive at least three doses of sulfadoxine-pyrimethamine as intermittent preventive treatment (IPT), even in asymptomatic cases, unless they are receiving cotrimoxazole for the treatment of opportunistic infections of HIV.

Many African governments use artemisinin-based combination therapy for malaria case management in pregnancy; with research still limited, WHO continues to recommend this treatment be used for uncomplicated malaria in pregnancy during the first trimester, if it is the only effective treatment available. In cases of severe anaemia, treatment with either artemisinin-based therapy or quinine, should be administered, although the former is preferred in the second or third trimester. There is little published information on the risks of co-administration of antiretrovirals and antimalarials, including artemisinin derivatives, but artemisinins have not yet been observed to have important toxicities when co-administered with antiretrovirals or when given in early pregnancy.

See References, page 109.