

HIV and malaria combine to adversely affect pregnant women and their infants

May 29 2007

Toronto, On -- University of Toronto researchers have uncovered the basis by which pregnant women protect themselves against malaria and have also discovered how the HIV virus works to counteract this defence. The research could lead to improved vaccines for pregnant women in malaria-ravished regions.

Malaria is a parasitic disease spread by mosquitoes that kills more than one million people every year. While the disease affects mostly children, malaria also severely affects pregnant women, especially during their first pregnancy, accounting for an estimated 400,000 cases of severe anaemia and 200,000 infant deaths each year. With the recent realization that HIV further aggravates pregnancy-associated malaria (PAM) there is an urgent need to understand these diseases during pregnancy and turn this knowledge into effective therapies.

Until now the mechanisms by which pregnant women defend themselves against malaria and how HIV impairs this defence have been unknown, but a paper published in PLoS Medicine (Public Library of Science) pinpoints how the virus targets the immune response in pregnant women. "PAM can be a deadly condition that leaves mothers and their children particularly vulnerable," says Professor Kevin Kain, an infectious disease specialist and lead author of the study. "We set out to understand how women acquire protection against malaria during pregnancy and how HIV infection impairs that protection. By understanding how they lost protection in the face of HIV we learned how they acquired protection against malaria in the first place."

PAM occurs when red blood cells infected with malaria parasites gather in the placenta resulting in damage to both mother and developing infant. First-time mothers are particularly susceptible to PAM whereas women in subsequent pregnancies become protected against PAM. Having HIV results in this loss of protection and makes them as susceptible as first-time mothers.

To uncover how HIV affects PAM, Kain and his team collected samples from women in the first pregnancy as well as from women in their subsequent ones living in the Kenyan region where malaria is common. The researchers demonstrated that protection to PAM is mediated by a special type of antibody that allows women to preferentially clear the parasites in their placentas. They found that HIV-infected women lose these antibodies and again become susceptible to the ravages of PAM.

The findings, according to Kain, may help in the development of PAM vaccines. "This is only the first step in creating therapeutics to treat this devastating disease," he stresses. "We hope to help translate this knowledge into more effective vaccines designed to generate these types of protective antibodies."

Source: University of Toronto

Citation: HIV and malaria combine to adversely affect pregnant women and their infants (2007, May 29) retrieved 3 July 2023 from <https://medicalxpress.com/news/2007-05-hiv-malaria-combine-adversely-affect.html>

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