ISGlobal
Barcelona Institute for Global Health

Plasmodium Vivax Infection in Pregnancy. The PregVax Consortium

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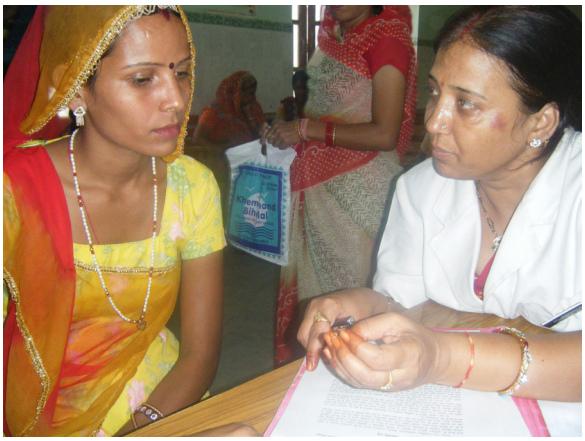
Plasmodium Vivax (P. vivax) is the most common and widely distributed human malaria parasite and causes up to 80 million cases annually, with the majority occurring in Asia and the Western Pacific, Central and South America and the Middle East. Globally, an estimated 93 million pregnancies occurred in areas endemic for *P.vivax* in 2007.

While the effects of *Plasmodium Falciparum (P. falciparum)* malaria in pregnancy have been well characterised and are responsible for considerable maternal and infant morbidity and mortality, surprisingly little is known about the burden and impact of *P. vivax* infection on maternal and foetal health. Some studies indicate adverse effects of *vivax* malaria in pregnancy; yet, they all provide only partial information on the epidemiological and clinical aspects of the infection in pregnancy and none on the mechanisms involved. This gives us a disconcerting and incomplete picture of the true burden and impact of *P. vivax* in pregnancy.



Recruitment of a pregnant woman into the PregVax study at the Sardar Patel Medical Hospital in Bikaner, Rajasthan, India.

The **PregVax Consortium** started back in 2008 to address the knowledge gaps in *P. vivax* infection during pregnancy. It has brought together eleven research institutions and some of the best multidisciplinary scientists and experts on vivax malaria from a variety of countries and regions across the world.

Under the umbrella of this consortium a cohort observational study of pregnant women from five *P. vivax* endemic countries (**Brazil, Colombia, Guatemala, India and Papua New Guinea**) that represent most of the world's *P. vivax* infections has been conducted. This study aims to describe the epidemiological and clinical features of *P. vivax* malaria in pregnancy. Compiling this information in a methodologically standardized way is essential to describe the impact of *P. vivax* malaria in pregnancy.

In addition, the project has been working to determine whether there are pregnancy specific *P. vivax* immune responses and characterize genotypically and phenotypically the parasites of the placenta. In an unprecedented effort, almost 10,000 pregnant women have been enrolled at the different project sites during their routine antenatal care visits and followed-up at the health facility until delivery.

The PregVax project is currently in its last stages and main results from the study will be soon available. Among the preliminary findings obtained so far are the following:

• The **prevalence of *P. vivax* malaria detected by microscopy** during pregnancy **was low across sites.** However, molecular diagnosis (PCR) detected substantially more *P. vivax* and *P. falciparum* infections than microscopy, suggesting a **high proportion of submicroscopic infections.**

PregVax

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Leading research at: ISGlobal Barcelona Institute for Global Health

COOPERATION

• Under the umbrella of the PregVax study, **the first *P. vivax* congenital malaria case in Guatemala, and the first in Latin America**, with genotypical, histological and clinical characterization has been described. This finding highlights the need not only to maintain but also to increase awareness of the problem and developing surveillance strategies specially during pregnancy.

• A histopathological and molecular study of placental infection with *P. vivax* has shown that ***P.vivax* can be associated with placental infection and might be able to sequester in the placenta.**

• Cytoadhesion phenotypes with a clinical impact in *P. vivax*. **Rosetting and cytoadhesion to CSA in *P. vivax* infections may negatively impact the health of infected hosts** and their potential contribution to mild sequestration.

Although *P. falciparum* is the most deadly species and the subject of most malaria-related research and literature, more attention should be given to *P. vivax*. So far, some progress is being done and further evidence is becoming available. This early evidence suggests that ***P. vivax* malaria can have deleterious effects on the health of the mother and the neonate. More accurate data of vivax malaria during gestation are essential to improve its clinical management and to guide control policies.** Furthermore, elucidating the mechanisms involved in the pathology of *P. vivax* in pregnancy **will help to develop specific control tools such as more effective drugs and vaccines**.

PregVax Consortium 2nd Investigators Meeting in Antigua, Guatemala. May, 2010

PregVax Partners

1. Barcelona Centre for International Health Research (CRESIB) - Barcelona Institute for Global Health (ISGlobal). Hospital Clínic, Barcelona, Spain. (Coordinating institution)

2. Centro Internacional de Vacunas (CIV), Cali, Colombia.

3. Fundação de Medicina Tropical Heitor Vieira Dourado (FMT-HVD), Manaus, Brazil.

4. Universidad del Valle de Guatemala (CES-UVG), Guatemala, Guatemala.

5. Sardar Patel Medical College (SPMC), Bikaner, India.

6. International Center for Genetic Engineering and Biotechnology (ICGEB), New Delhi, India.

7. PNG Institute of Medical Research (PNG IMR), Madang, Papua New Guinea.

8. Karolinska Institutet (KI), Stockholm, Sweden.

9. Istituto Superiore di Sanità (ISS), Rome, Italy.

10. Centers for Disease Control and Prevention (CDC), Malaria Branch / NCZVED / DPD / CDC, Atlanta, USA.

11. University of Melbourne, Melbourne, Australia.

www.pregvax.net