STUDIES ON HUMORAL RESPONSES AND EFFECTS OF PRENATAL MALARIA IN WOMEN LIVING IN A MALARIA HOLOENDEMIC AREA OF WESTERN KENYA.

BY

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ABSTRACT

To study the humoral responses and effects of prenatal malaria to women living in malaria holoendemic area of western Kenya, naturally acquired humoral immune responses to malaria-specific antigens, levels of parasitaemia and infant birth weight were measured for 135 pregnant women immediately after delivery.

Levels of immunoglobulin G (IgG) were measured by enzyme linked immunosorbent assay (ELISA) in placental and peripheral blood. No significant difference ($p>0.05$) in levels of antibodies in placental and peripheral blood for merozoite surface protein-1 (19) [MSP-1 (19)], circumsporozoite protein [CSP] and sequestrin [R (0-1)] was found.

For placental blood, antibody titres were significantly lower (for MSP-1 (19); $H=13.765$, $p=0.001$; CSP, $H=20.916$, $p<0.001$, R (0-1), $H=13.387$, $p<0.001$) in primigravid compared to secundigravid and multigravid women among the uninfected mothers. For infected mothers, the difference in antibody titres were not significant: MSP-1 (19), $H=3.595$, $p=0.165$; CSP, $H=0.939$,$p=0.625$; and R (0-1), $H=0.954$, $p=0.094$.

For peripheral blood, no significant difference ($H=9.294$, $p=0.054$) in the antibody titres against MSP-1 (19) in pregnant and nonpregnant individuals was observed. However, antibody titres in pregnant women were significantly lower ($H=20.916$, $p<0.001$, $H=31.944$, $p<0.001$) than in nonpregnant individuals for CSP and R (0-1) respectively.

There was positive correlation between antibody titres in placental and peripheral blood for MSP-1(19) ($Z=9.327$, $p<0.001$), CSP, ($Z=7.744$, $p<0.001$) and sequestrin [R(0-1)] ($H=5.338$, $p<0.001$).

There was no correlation between parasitaemia and antibody titres for MSP-1(19), in placental and peripheral blood (Z=-0.666, p=0.506) and (Z=0.363, p=0.716) respectively. Similarly, no correlation (Z=-0.156, p=0.119) was observed between levels of antibodies and parasitaemia for placental and peripheral blood (Z=0.470, p=0.638) for CSP. The trend was similar for R(0-1) with no correlation (Z=-0.173, p=0.863) between levels of antibodies for R(0-1) and parasitaemia.

No correlation was found between low birth weight (<2500g) and antibody levels for MSP-1(19), CSP and R(0-1) (Z=-0.951, p=0.342, Z=0.220, p=0.826), Z=-0.139, p=0.889) respectively.

These studies have demonstrated that pregnant women have lower malaria specific antibodies compared to nonpregnant individuals. Considering that antibodies are important in clearance of malaria parasites, this quantitative reduction in antibody levels may lead to poor antidisease immunity hence increasing the susceptibility of pregnant women to malaria.