

IMPACT OF MALARIAL PIGMENT (HEMOZOIN) DERIVED FROM *Plasmodium falciparum* ON HUMAN PLACENTA

IMPACTO DEL PIGMENTO PALÚDICO (HEMOZOÍNA) DERIVADO DE *Plasmodium falciparum* EN LA PLACENTA HUMANA

Carolina López-Guzmán¹; Ana María García*² & Ana María Vásquez-Cardona³

¹PhD student, Malaria Group, University of Antioquia. Medellín – Colombia.

²Researcher, Malaria Group, University of Antioquia. Medellín – Colombia.

³Researcher, Malaria Group, Professor Microbiology School. University of Antioquia. Medellín – Colombia.

amaria.vasquez@udea.edu.co

Malarial pigment or hemozoin (HZ) is a product of the hemoglobin digestion by the erythrocytic stages of *Plasmodium* spp. Purified malaria pigment has been implicated in several pathological processes, such as inflammation, oxidative stress, endothelial dysfunction, and immune dysregulation. Malaria infection during pregnancy can lead to abortion, premature delivery, intrauterine growth restriction and low birth weight. Although the accumulation of malaria pigment in the placental tissue is a common hallmark of placental malaria, the effect of this metabolic product on the tissue has been less studied. The present study focused on exploring the impact of natural HZ derived from *Plasmodium falciparum* culture on human placental explants exposed *in vitro*. The integrity of placental tissue was evaluated by histology using hematoxylin-eosin staining as well histochemical evaluations for collagen type I and laminin, and trophoblast membrane was evaluated by immunohistochemical staining with Cytokeratin 7. The effect of HZ in tissular viability was evaluated by measuring the apoptosis and the endocrinology function. The results indicate that natural HZ induces an increase in tissue damage, dysregulation of collagen distribution in the villous stroma, and an increase in the frequency of cellular apoptosis. Our results show a direct effect of HZ in the absence of other potential stimuli such as maternal cytokines and leukocytes or parasites, underscoring HZ alone as an important component in the pathogenesis of placental malaria. Understanding the effects of the accumulation of HZ in placental tissue will enable identification of high-risk women and may lead to discovery of new drug targets against associated adverse pregnancy outcomes.

Keywords: Hemozoin – *Plasmodium falciparum* – placental malaria – histopathology human – placental explant