

Cancer Research

Epidemiology

Abstract 5048: Determination of haptoglobin, hemoglobin genotypes and malaria incidence in Nigerian breast cancer patients

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Abstract

Breast cancer is the second leading cause of cancer morbidity and mortality globally. Cancer chemotherapy commonly result in hemolysis, which impacts patient overall health. There is a need to determine genetic factors associated with hemolysis in breast cancer patients. Haptoglobin (Hp), a polymorphic protein plays important role in hemoglobin clearance and disease predisposition, but has been reported to have no prognostic factor in breast cancer. However, understanding selection pressure that drives certain gene mutations in specific populations and how it confers protection or susceptibility to diseases is crucial. In Nigeria, breast cancer, malaria infection and sickle cell disease are prevalent and associated with hemolysis, but little is known of their association in breast cancer patients. This study aims to determine relationship between haptoglobin, hemoglobin genotypes and submicroscopic malaria co-morbidity in clinically diagnosed breast cancer and healthy Nigerian women. DNA was extracted from blood using standard methods. Haptoglobin 2 and hemoglobin genotypes were detected by RFLP-PCR, while Plasmodium falciparum infection was detected by primer specific amplification of plasmodium cytochrome oxidase III gene (cox III) in 75 clinically diagnosed breast cancer (BC) and 287 healthy women (control; HC). Proportions were determined and compared in the two groups and test of association was carried out with significance level set at $P < 0.05$. In BC groups, 3 (4.1%) of 72 Hp 2-2 phenotypes was detected compared to a significantly higher occurrence of 48 (16.7%) of 287 in HC group ($p < 0.05$). Conversely, malaria infection was detected in 68 (94.4%) BC versus 255 (88.9%) in HC group. A similar proportion had Hp deletions (2 in BC and 8 in HC group). There was a low prevalence of hemoglobin S genotype in the entire population and relative risk for Hp 2-2 polymorphism in hemoglobin genotypes was not significantly different. In conclusion, this study reports in breast cancer and healthy women an inverse correlation of haptoglobin (Hp2-2) genotype with malaria incidence in southwest Nigeria. The results imply a possible protection against hemolysis and can play significant role in determining choice of cancer therapy for good patient treatment outcomes.

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