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FGFR2 Genetic Variants in Southern African Women with Breast Cancer

Abstract

Background

Breast cancer is the most common carcinoma in South African women, who have different cancer incidence rates depending on their genetic ancestry. African populations are more genetically diverse than others, but genetic variants have been studied mainly in European populations. We examined the association of four single nucleotide polymorphisms of the fibroblast growth factor receptor 2 (FGFR2), which have been associated with breast cancer in non-African populations, with breast cancer in Black, Southern African women.

Aim

The purpose of this study was to investigate the associations of FGFR2 polymorphisms in African women with breast cancer.

Methods

This prospective study included 1001 black female patients with biopsy confirmed breast cancer and 1006 participants without breast cancer from Charlotte Maxeke Johannesburg Academic Hospital and Chris Hani Baragwanath Academic Hospital in Johannesburg, South Africa. Genomic DNA was extracted from whole blood. The variants rs2981582, rs35054928, rs2981578 and rs11200014 were analyzed using allele-specific PCR KASP™ technologies. The χ^2 test or Fisher's exact test was used to evaluate the genotype frequencies.

Results

We found no association of those single nucleotide polymorphisms with breast cancer in our sample overall, but we did find an association of the C/C homozygote genotype for rs2981578 with invasive lobular carcinoma.

Conclusion

These results show that genetic biomarkers of breast cancer risk in European populations are not necessarily associated with risk in sub-Saharan African populations.

Impact

African populations are more heterogenous than other populations, and the information from this population can help focus genetic risk of cancer in this understudied population.