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Second hand smoking is positively associated with breast cancer risk but not with n-acetyltransferase 2 genetic variants among arab women in israel—a case-control study

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Background: The effect of second-hand smoking (SHS) on breast cancer etiology is controversial. Genetic variants of N-acetyltransferase 2 (NAT2) enzyme which is involved in tobacco carcinogen metabolism, may modify the association between SHS and breast cancer. The aim of this study was to evaluate the relationship between SHS and breast cancer risk by NAT2 variants in Arab Israeli women, a unique population with high exposure to SHS.

Methods: A population-based case-control study consisting of never-smoking Arab women aged 30-70 from Israel: 137 prevalent (diagnosed in 2008-2013) breast cancer patients and 274 population-based controls were used for the present study. All participants were interviewed using a questionnaire related to past and current exposure to SHS, socio-demographic and gynecological characteristics. Each participant provided a buccal smear for NAT2 genotype analyses. Logistic regression models adjusted for potential confounders and stratified by NAT2 variants were used to assess the association between SHS and breast cancer.

Results: SHS was associated with breast cancer risk with adjusted odds ratio (OR) of 2.14 (95% confidence interval, CI 1.21-3.78). Higher exposure to SHS was associated with higher risk of breast cancer compared to never exposed women, those exposed to SHS during childhood, adolescence and currently had an OR of 3.60 (95% CI 1.85-7.21) while those exposed only during adolescence and currently had an OR of 1.73 (95%CI 1.05-2.86). NAT2 variants did not modify these associations.

Conclusions: SHS exposure in Arab women who never smoked is associated with increased breast cancer risk. NAT2 genetic variation does not play a role in the association.

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