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Passive smoking, household exposure to PAH, GST polymorphisms and risk of breast cancer

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Background: Polycyclic aromatic hydrocarbons (PAHs) may increase breast cancer risk and the association may be modified by interacting with the genetic differences of GSTs. Kerosene gas cooker and clay oven usage are unique sources of household exposure to PAHs in Egyptian women. This study aimed to investigate whether multiple GST polymorphisms (GSTT1, GSTM1 and GSTP1) alone or interacting with domestic source of PAHs and passive smoke can alter breast cancer risk.

Methods: A case-control study was conducted on 150 breast cancer confirmed cases and 150 matched controls. Blood sample was collected and GST polymorphisms were genotyped by PCR-RFLP technique.

Results: Univariate analysis showed a significant increase of breast cancer risk among those exposed to cigarette passive smoke (OR 2.2; 95%CI (1.3-3.37), kerosene gas cookers (OR 8.56; 95%CI (5.03-14.65) and clay oven usage (OR 5.52; 95%CI (2.93-10.41). Odds ratios for joint effects on breast cancer risk among women with GSTM1 null genotype were 1.34 (95% CI, 0.74-2.43) for never clay oven usage and 6.32 (95%CI, 2.39-16.67) for ever clay oven usage and the interaction was showed borderline significance (p=0.067). On multivariate analysis, this effect became more evident only in premenopausal women and risk was significantly higher with GSTM1 null genotype and ever exposure to clay oven fumes compared to present genotype and never clay usage.

Conclusions: The present study suggested a significant role of kerosene gas cookers on the risk of breast cancer and the interaction between exposures to clay oven fumes with GSTM1 null genotype can modify that risk.

Biography

Nelly H Alieidin is professor of cancer epidemiology and biostatistics at National Cancer Institute NCI, Cairo University since 2006, responsible for teaching basic and intermediate courses of epidemiology for master and doctorate degree of cancer prevention at NCI, Cairo. She was non-communicable disease officer at regional office of WHO (EMRO) from 2005 to 2007, head of Cancer Epidemiology & Biostatistics department and managing hospital Information System and hospital-based Cancer Registry at NCI, Cairo 2007 – 2013. She is peer reviewer and statistical editor of the Journal of Egyptian National Cancer Institute since 2001 and reviewer of the International Journal of Cancer 2006-2007.

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