Genetic Polymorphisms of Glutathione S-Transferase P1 (GSTP1) and Breast Cancer in Korean Women

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Backgrounds Our previous study suggested that the GSTM1 and GSTT1 genotypes are important modifiers of susceptibility to breast cancer among premenopausal women but of less importance among postmenopausal women. Here we extended the study to evaluate the role of genetic polymorphisms of GSTP1 on breast cancer development in Korean women.

Methods A hospital based case-control study was conducted to evaluate the association between genetic polymorphism of GSTP1 and breast cancer in Korean women. One hundred and seventy one histologically confirmed incident breast cancer cases, 171 age-matched controls with no present or previous history of cancer recruited from three hospitals during 1994-1998 were analyzed for GSTP1 genetic polymorphisms. Odds ratios and 95% confidence intervals were estimated by unconditional logistic regression after adjustment for known or suspected risk factors of breast cancer.

Results The frequency distribution of GSTP1 Ile containing genotype was 29% in cases, 34% in control. GSTP1 Ile containing genotype has no significant association with breast cancer among all women (OR: 0.8, 95% CI: 0.5-1.2), or in premenopausal women (OR: 1.1, 95% CI: 0.6-2.2). However, there was a significant association between GSTP1 Ile containing genotype and breast cancer in postmenopausal women (OR: 0.4, 95% CI: 0.2-0.9). There was a synergistic interaction between alcohol consumption and GSTP1 Ile containing genotype (p for interaction=0.01); GSTP1 Ile containing genotype decreased breast cancer risk among never drinker (OR: 0.6, 95% CI: 0.3-1.0), whereas GSTP1 Ile containing genotype increased breast cancer risk among ever drinker (OR: 2.7, 95% CI: 1.1-6.7).

Conclusions These results suggest that GSTP1 Ile containing genotype decreased breast cancer risk and there was a novel gene-environment interaction of breast cancer development between alcohol consumption and GSTP1 Ile containing genotype. Additional studies are needed to confirm these findings.