

# GENETIC POLYMORPHISM IN FOLATE AND ALCOHOL METABOLISM AND BREAST CANCER RISK IN THAI WOMEN

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**Background:** Dietary folate as well as polymorphic variants in one-carbon metabolism genes may modulate risk of breast cancer through aberrant DNA methylation and altered nucleotide synthesis and repair. Alcohol is well recognized as a risk factor for breast cancer and interactions with one-carbon metabolism have also been suggested.

**Purpose:** The purpose of this study was to test the hypothesis that multigenotypic polymorphisms in the folate and alcohol metabolic pathway were associated with breast cancer risk.

**Methods:** Five hundred and seventy patients with histopathologically confirmed breast cancer and 497 controls were included in the present study. Twenty eight single nucleotide polymorphisms (SNPs) in the MTR, MTRR, MTHFR, TYMS, ADH1C, ALDH2, DRD2, DRD3, SLC6A4, NUDT1, GSTP1, NAT1, NAT2, CYP2E1 were genotyped. Association of genotypes with breast cancer risk was evaluated using multivariate logistic regression to estimate odds ratios (OR) and their 95% confidence intervals (95%CI).

**Results:** Increased risk were observed for homozygotes MTR (rs1770449) and MTR (rs1050993) with the OR=2.21 (95%CI 1.18-4.16) and OR=2.24 (95%CI 1.19-4.22), respectively, and for heterozygote DRD3 (rs167770) OR=1.36 (95%CI 1.03-1.80). A stratified analysis by menopausal status indicated the association of DRD2 (rs10891556), SLC6A4 (rs140701), NUDT1 (rs10281945) and NAT2 (rs1799930) with breast cancer were mainly evident in premenopausal, while those of MTRR (rs162049), DRD3 (rs167770) and GSTP1 (rs612020) significant in postmenopausal women.

**Conclusion:** Our results suggest that genetic polymorphisms in folate and alcohol metabolic pathway influence the risk of breast cancer in Thai population.