

Methylenetetrahydrofolate reductase polymorphisms interact with alcohol and meat consumption to influence the risk of colon cancer in Thailand

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Background: In Thailand, colon cancer is ranked the tenth most common cancer and data from cancer registry have shown a tendency for increase in both sexes over the last 2 decades. There are a number of established genetic and nutritional factors that increase colon cancer risk. Functional polymorphisms in methylenetetrahydrofolate reductase (MTHFR) have attracted attention on colon cancer risk but have shown conflicting results on different ethnics. Importantly, it has not been studied in the Thai population. Therefore, this study aimed to explore the effects of MTHFR polymorphisms on colon cancer risk and possible interactions with alcohol and meat consumption in Northeast Thailand.

Methods: We conducted a hospital-based case-control study during 2002-2006 with matching between case-control by age and sex with 1: 1 ratio (130 cases: 130 controls). Information was collected using a structured-questionnaire. Alcohol drinking was categorized to be drinkers and non-drinkers based on units per day for average amount. Also, frequency and amount of meat intake were dichotomized on low and high levels. Blood samples were obtained for assay of MTHFR C677T and A1298C polymorphisms by polymerase chain reaction with restriction fragment length polymorphism (PCR-RFLP) techniques. Associations between variables and colon cancer were assessed using conditional logistic regression.

Results: Although, none of the polymorphisms showed any significant effect on colon cancer risk by genotype alone, when combined with alcohol and meat consumption the MTHFR 677CC genotype showed a significantly increased risk (OR_{adj}=2.74; 95% CI: 1.00-7.56 and OR_{adj}=2.55; 95% CI: 1.10-5.87, respectively). However, the interactions between MTHFR A1298C polymorphism and alcohol or meat intake were not found to be associated with colon cancer risk.

Conclusion: There was a significant interaction between MTHFR 677CC genotype and alcohol or meat consumption in increasing the risk of colon cancer in Thai population. Increased knowledge in changing of dietary patterns targeted toward subgroups that are genetically susceptible is recommended to effective cancer control.