

Combined effects of isothiocyanates (ITCs) intake, glutathione S-transferases (GSTs) polymorphism and risk habits on oral squamous cell carcinoma (OSCC) associated with earlier age of disease onset

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Content:

Introduction: ITCs found in cruciferous vegetables has been reported to reduce cancer risk by inducing phase II conjugating enzymes, in particular GSTs. Interestingly, these enzymes also metabolize ITCs therefore; the protective effects of ITCs would depend on the activity of GSTs. This study aimed to determine association between dietary ITCs, GSTs polymorphisms and risk habits (cigarette smoking, alcohol drinking and betel-quid chewing) with oral cancer. **Method:** Included in this study were 115 OSCC patients and 116 healthy subjects. Information on ITC intake from cruciferous vegetables was collected via a semi-quantitative FFQ. Peripheral blood lymphocytes were obtained for genotyping of GSTM1, GSTT1 and GSTP1 using PCR multiplex and PCR-RFLP. Chi-square and logistic regression were performed to determine the association of ITC and GSTs polymorphism and risk of oral cancer. **Results:** When dietary ITC was categorized into high (greater than/equal to median) and low (less than median) intake, ITC consumption was higher among cases (51.3%) than controls. However, it was not statistically significant ($p = 0.645$). **Discussion:** Odd ratios analysis showed no significant association between ITC intake, GSTM1, GSTT1 or GSTP1 genotypes with oral cancer risk. However, GSTP1 wild-type was associated with later disease onset in women above 55 years of age ($p = 0.017$). Among men above 45 years of age, there was a significant 17-year difference in the age of OSCC onset between those with GSTP1 wild-type + low ITC intake and GSTP1 polymorphism + high ITC intake ($p < 0.001$). Similarly further analysis stratified by risk habits (drinking and chewing), showed that GSTP1 polymorphism + high ITC intake was associated with earlier disease onset ($p < 0.001$). This study suggests that combinatory effects between dietary ITCs, GSTP1 polymorphism and risk habits may be associated with risk of oral cancer and modulate the age of disease onset.

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