

Aldehyde dehydrogenase 2 (ALDH2) and glutathione S-transferase M1 (GSTM1) polymorphisms in relation to oral cancer risk among Malaysians

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Content:

Introduction: ALDH2 is an enzyme involved in major oxidative pathway of alcohol metabolism while GSTM1 is a drug-metabolizing enzyme of acetaldehyde. It has been reported that the mutant ALDH2 allele and the absence of GSTM1 contributes to increased oral cancer risk due to reduced acetaldehyde metabolism. This study aims to determine ALDH2 and GSTM1 polymorphisms and its association with oral cancer risk. **Method:** An unmatched case-control study was conducted using 163 oral cancer patients and 87 non-cancer subjects selected from the OCRCC database. ALDH2 and GSTM1 genotypes were determined using PCR-RFLP from peripheral blood. Multiple logistic regression was employed to assess association between polymorphisms and oral cancer risk. **Results:** Most common risk habit was betel-quid chewing (44.0%), followed by smoking (30.4%) and alcohol drinking (29.6%). The prevalence of ALDH2 polymorphism is only 5.7%, while GSTM1 null is seen in 51.2%. Alcohol drinking and the combination of ALDH2 polymorphism and alcohol consumption is significantly associated with increased risk of oral cancer ($p < 0.001$). **Discussion:** In this population, although the prevalence of alcohol consumption is low compared to other populations, alcohol drinking has been found to significantly increase oral cancer risk, even after adjusting for confounding factors (age, gender and ethnic) (aOR 6.8, 95% CI 2.6, 18.1). The prevalence of ALDH2 polymorphism was found to be much lower compared to other Asian population such as the Japanese and Taiwanese. In relation to oral cancer risk, no significant association was seen for both the polymorphisms of ALDH2 and GSTM1. However, when analysis was done for the combination of ALDH2 polymorphism and alcohol consumption, those who concurrently exhibit ALDH2 polymorphism and consumed alcohol was found to be 6 times more likely to develop oral cancer (aOR 6.6, 95% CI 2.4, 17.9). No such association was observed for the combination of GSTM1 polymorphism and alcohol consumption. In conclusion, alcohol consumption is a significant independent risk factor for oral cancer among Malaysians while ALDH2 polymorphism together with the habit of alcohol drinking also confers an increased risk for oral cancer.

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