CYP1A1 MspI polymorphism and cervical carcinoma risk in the multi-ethnic population of Malaysia: a case-control study

ABSTRACT

Background: Tobacco smoking is considered a risk factor for cervical cancer development due to the presence of tobacco based carcinogenic metabolites in cervical cells of female smokers. In this study, we investigated the role of the T3801C (MspI) polymorphism of CYP1A1, a gene encoding an enzyme necessary for the initiation of tobacco based carcinogen metabolism, on cervical cancer risk. The T to C substitution may alter CYP1A1 activities, potentially elevating cervical cancer risk. Since results of gene-disease association studies vary according to the study population, the multi-ethnic population of Malaysia provides an excellent representative cohort for identifying and comparing the cervical cancer risk among the 3 major ethnics in Southeast Asia in relation to CYP1A1 MspI polymorphism. Materials and Methods: A total of 195 Thin Prep Pap smear samples from HPV negative and cancer free females were randomly selected as controls while 106 formalin fixed paraffin embedded samples from females with invasive cervical cancer were randomly selected for the cases group. The polymorphisms were identified using restriction fragment length polymorphism (RFLP) PCR. Results: We found no significant associations between CYP1A1 MspI polymorphism and cervical cancer in the general Malaysian female population. However, upon ethnic stratification, the variant C/C genotype was significantly associated with a 4.66-fold increase in cervical cancer risk in Malay females (95% CI= 1.21-17.9; p=0.03). No significant association was observed in the Chinese and Indian females. Additionally, there were no significant associations in the dominant model and allele frequency model analysis in both the general and ethnically stratified female population of Malaysia. Conclusions: Our findings suggest that the C/C genotype of CYP1A1 MspI polymorphism is associated with the development of cervical carcinoma in the Malay females of Malaysia.

Keyword: Cervical cancer; CYP1A1; Malaysia; MspI; SNP