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Investigation of NQO1 genetic polymorphism, NQO1 gene expression and PAH-DNA adducts in ESCC. A case-control study from Iran

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ABSTRACT. We evaluated the effect of NQO1 genetic variation on PAH-DNA adducts in esophageal squamous cell carcinoma (ESCC) in northeast Iran. Golestan Province in northeast of Iran has one of the highest esophageal cancer incidences in the world. The study included 93 ESCC cases and 50 control individuals who were seen at the clinical cancer center in Golestan province. NQO1 C609T genotypes were determined by PCR-RFLP analysis. NQO1 gene expression in tissue samples was determined by quantitative real-time PCR. Immunohistochemical techniques were used to detect PAH-DNA adducts in ESCC and normal esophageal tissues. The distributions of NQO1 genetic polymorphism between cases and the control group were not significantly different. NQO1 gene expression was not higher in tumor tissues than in normal esophageal tissues adjacent to the ESCC; expression was higher in tumor tissues that had the NQO1 T allele. NQO1 gene expression was high in normal esophageal tissues. The level of PAH-DNA adducts was significantly higher in ESCC tissues of cases than in normal tissues adjacent to tumor tissues and in normal esophageal tissues of healthy con-

trols. There were no significant differences between the adduct levels of normal esophageal tissues of patients and controls. There was also no significant relationship between cigarette smoking and PAH-DNA adducts. We concluded that PAHs are a risk factor for ESCC and that PAH-DNA adducts have potential as a biomarker for risk of ESCC.

Key words: NQO1; Esophageal squamous cell carcinoma (ESCC); Northeast Iran; PAH-DNA adduct

