Association between the polymorphisms in exon 12 of hypoxia-inducible factor-1α and the clinicopathological features of oral squamous cell carcinoma

Oral squamous cell carcinoma (OSCC) is a common malignancy. The incidence of OSCC is particularly high in some Asian countries because of the popularity of the habit of chewing areca. Hypoxia-inducible factor-1α (HIF-1α) is up-regulated in the hypoxic microenvironment to enhance tumor survival. Five polymorphisms have been identified in exon 12 of HIF-1α including the C1772T polymorphism causing P582S, and the G1790A polymorphism causing A588T of the HIF-1α protein. This study investigated the relationship between these functional polymorphisms and the risk of progression of OSCC. PCR and direct sequencing were utilized to compare the genotypic polymorphism and allelic frequency of HIF-1α in 96 normal controls and 305 OSCC patients. No statistically significant difference in C1772T and G1790A genotypes and allelic frequency between control and OSCC patients was found. However, multivariate analysis indicated that the A carrier of HIF-1α G1790A in OSCC patients was significantly higher in larger tumors than in the contrasting group with an adjusted odds ratio of 2.92. The T carrier of HIF-1α C1772T in buccal cancer patients was significantly higher in the non-areca-chewing group with an adjusted odds ratio of 0.111. The buccal cancer patients with C1772T or G1790A had lower recurrence frequency with an odds ratio of 0.266. These findings may suggest a correlation between the HIF-1α C1772T and G1790A polymorphisms and the growth of OSCC, and the decrease of OSCC recurrence frequency.