
Introduction: Analyses based on methylation profiling offers an understanding in the mechanisms of carcinogenesis. Single gene analysis is insufficient to describe the complex perturbations responsible for cancer onset, progression and invasion.

Objective: To identify gene pathways of highly hypermethylated genes in oral squamous cell carcinoma (OSCC) using DNA microarray-based methylation profiling. The study focused on the deregulation of gene sets or pathways rather than on individual genes involved in carcinogenesis mechanisms.

Methods: DNA methylation assay was carried out on bisulfite-converted DNA extracted from frozen section tissues of 3 normal subjects and 20 patients of OSCC, using Illumina Infinium Methylation assay. 20620 genes of raw data obtained were normalized and analyzed using Genome Studio software. Significant methylated genes were generated by Gene Set Enrichment Analysis (GSEA), with less than 25% false discovery rate and 0.05 of nominal p-value were applied in gene pathway analysis.

Results: High quality bisulfite-converted DNA was obtained and the methylation array was successfully run on all samples. In unsupervised cluster analysis, the normal subject samples were cluster differently from OSCC cases with false discovery rate in p-value of less than 0.05 and fold change more than 2.0. 113 hypermethylated genes were generated by GSEA where 18 hypermethylated genes are involved in pancreatic cancer, 42 in cell cycle, 20 in apoptosis, 15 in chronic myeloid leukemia, 7 in bladder cancer and 9 in non-small cell lung cancer.

Conclusions: Based on the data analysis, the hypermethylated genes found on these pathways are related the cancer-causing mechanisms.

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PALATAL INJECTION PAIN RELIEF OF LIPOSOME-ENCAPSULATED 2% LIDOCAINE PREPARED BY ULTRASONIC SCALER

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Palatal needle injection is common in dental treatment and has been an unpleasant procedure.

Objectives: A novel method was developed to encapsulate 2% lidocaine HCl in liposomes and the encapsulated lidocaine was tested for its efficacy in reducing palatal needle injection pain.

Methods: The liposome-encapsulated 2% lidocaine (LEL) was prepared by sonicating 2% lidocaine HCl solution with dry cholesterol mixture using a dental ultrasonic scaler for 1 minute. The onset (T0) and effective time (Teff) of the LEL were determined by a pin-prick test on the palatal mucosa in 10 normal subjects. In another experiment, the preparation was tested in another 22 subjects for its pain-relief effect during standard palatal needle injection compared with 10% benzocaine/2% tetracaine gel (BTG).

Results: (1) Ton and Teff of LEL were 39.0 ± 21.4 s and 157.5 ± 44.3 s respectively, (2) VAS during injection after the application of LEL (4.1 ± 2.3) was significantly lower than that after the application of BTG (4.8 ± 2.8; p = 0.02).

Conclusions: The liposomal encapsulation of lidocaine by the dental ultrasonic scaler has proved effective in enhancing the efficacy of 2% lidocaine HCl to be used as a topical anesthetic.

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