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Assessing the Life Quality and Selected Salivary Biomarkers among Group of Patients with Oral Squamous Cell Carcinoma

A Thesis

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Abstract

Background: Relating oral and maxillofacial region, there is increasing incidence of malignant tumors representing more serious and growing problem in many parts of the world, surgical removal of the tumor remains the treatment of choice with or without adjuvant therapy, frequently affects the patients' appearance, swallowing, or speech functions, and subsequent adjuvant radiotherapy further induces irreversible fibrosis of the remaining cheek and neck structures, leading to impaired taste and/or permanent xerostomia. Quality of life assessment become an important issue, the data from quality of life questionnaires are becoming an important supplement to information pertaining to the treatment outcome for oral squamous cell carcinoma patients.

Oral squamous cell carcinoma represents the most common epithelial malignancies with significant morbidity and mortality. Saliva is a noninvasive and safe source, for investigation and follow up of oral squamous cell carcinoma. Epidermal growth factor receptor is expressed in many types of cancer and studied extensively in many of them, despite the fact that epidermal growth factor receptor is over-expressed in many types of head and neck squamous cell carcinoma. Also, saliva is now considered a pool of biological markers that range from change in the salivary levels of cytokines IL-10, IL-13, IL-17, cytokeratin 19 and interferon gamma.

Aims of the study: The study aimed to evaluate patient's quality of life with oral squamous cell carcinoma after surgical treatment in different time's intervals. Also aimed to detect R521K polymorphisms of epidermal growth factor receptor among oral squamous cell carcinoma patients and healthy individuals, as well as assess cytokines levels of IL-10, IL-13 and IL-17, interferon gamma and cytokeratin 19

before and after surgical treatment in saliva of patient with oral squamous cell carcinoma and compare their levels with healthy subjects.

Subjects, Materials and Methods: thirty-five patients for both gender with an age range 41-77 year with oral squamous cell carcinoma were evaluated for their quality of life using the university of Washington quality of life questionnaire. Patients asked to complete the questionnaire during intervals 7 days, 1 month, 3, and 6 months postoperatively. Twenty-five patients with oral squamous cell carcinoma patients along with fifty healthy individuals (twenty-five of them were patient's relative and others twenty-five were not), DNA from saliva sample was genotyped for the single nucleotide polymorphism (SNP) of EGFR R521K G > A by Sanger sequencing method. Also, twenty-five patients before and after operation and twenty-five healthy individuals well matched in age and gender as control were included for salivary cytokine IL 10 IL 13, IL 17, cytokeratin 19 and interferon gamma assessment by Enzyme Linked Immuno-Assay

Results: For quality of life questioners, after surgical removal of the oral cancer, individual domains and subjective complain were deteriorated then improved gradually over the time intervals. Pain, mood and anxiety rated as the most important domains while other domains were less important.

The results of sequencing for R521K single nucleotide polymorphism of epidermal growth factor receptor gene noticed six single nucleotide polymorphisms (rs11536635, rs2227983, rs537828797, rs547837297, rs767193132, and rs981031383) and significant difference of polymorphisms in OSCC patients in comparison to control groups (positive and negative control groups) (p=0.004 and 0.009 respectively). The results revealed A\A genotype for rs11536635 SNP was unfavorable genotype. while for 2227983 SNP G\G genotype was higher frequency with OSCC patients.

The results concerning salivary cytokines indicated that the mean value of IL 10 IL 13, IL 17 and cytokeratin 19 levels were highly significantly raised in oral squamous cell carcinoma patients as compared to controls and also were higher in oral squamous cell carcinoma patient's pre-operation in comparison to post operation mean value. While the mean value of salivary interferon gamma level was highly significantly decreased in OSCC patients as compared to controls and it was lower in oral squamous cell carcinoma pre-operating and increased significantly ten days after surgical removal of tumor.

Conclusions: The University of Washington Quality of Life questionnaire is a practicable and the easiest questionnaire for assessment of the quality of life of patients and subjective complain of patients with oral cancer. An improvement in overall and health-related quality of life is necessary to be observed following surgical treatment for patients with oral cancer. The epidermal growth factor receptor R521K genetic polymorphisms might be associated with oral squamous cell carcinoma patients. Salivary levels of cytokines IL 10 IL 13, IL 17, cytokeratin 19 and interferon gamma could changeable biomarkers in regard to OSCC.