

CORRELATION BETWEEN THE LEVELS OF SALIVARY α -AMYLASE ACTIVITY AND XEROSTOMIA IN HEAD AND NECK CANCER PATIENTS UNDERGOING RADIATION THERAPY

Salivary α -amylase, an enzyme present in the oral cavity, is responsible for the breakdown of starch to smaller carbohydrate molecules. Xerostomia, or dry mouth, is a known effect on patients undergoing radiotherapy. Salivary α -amylase was used in this study to assess the severity of xerostomia on thirty (30) Head and Neck Squamous Cell Carcinoma (HNSCC) patients undergoing radiotherapy in Jose R. Reyes Memorial Medical Center.

The main objective of this study was to correlate the severity of radiotherapy-induced xerostomia on HNSCC patients and the enzymatic activity of salivary α -amylase. Informed consent was obtained prior to saliva specimen collection. Unstimulated passive drool technique was employed and samples were collected into a polypropylene vial (Salimetrics®) and stored at -80°C . Three separate collections were performed, prior to radiotherapy (Day 0), radiotherapy period (Day 21) and postradiotherapy period (Day 42) and Radiation Therapy Oncology Group (RTOG) scorings were also analyzed per collection. RTOG was used to evaluate the effects brought about by the toxicities of radiotherapy, and spectrophotometry was performed to assess the levels of salivary α -amylase activity through the principle of colorimetry.

Results of the experiment showed a mean salivary α -amylase activity of 183.10 IU/mL at Day 0, 31.36 IU/mL at day 21 and 72.93 IU/mL at day 42. Repeated measures of ANOVA showed that from Day 0 to Day 21 there was a 151.741 IU/mL ($p<0.001$) decrease in salivary α -amylase activity, a 41.564 IU/mL ($p<0.001$) increase from Day 21 to Day 42, and a 110.177 IU/mL ($p<0.001$) decrease from Day 0 to Day 42. Multinomial Logistics Regression showed that as the radiotherapy progresses the probability of having a RTOG Grade of 1 (850,000x) and 2 (100,000x) is greater than having a RTOG Grade of 0. Pearson correlation was utilized to determine if there is a significant correlation between the levels of salivary α -amylase and the mean parotid dose. There is a strong negative correlation (-0.966) suggesting that as the dose of radiation administered to the patients increases, the levels of salivary α -amylase decrease by 0.021 IU/mL.

In comparison to the baseline, there was a decrease in the levels of salivary α -amylase on the radiotherapy period. The salivary α -amylase levels during the postradiotherapy period were greater than that during the radiotherapy period but with high variations from each other. As the radiotherapy continues, the probability of having a RTOG Grade of 1 and 2 is greater than having a RTOG Grade of 0. The levels of salivary α -amylase and the mean parotid dose showed an inverse relationship that as the dose administered to the patients increases, the levels of salivary α -amylase decreases. Based on the study conducted and the established relationship between the variables, the quantitation of salivary α -amylase is an effective predictive marker for radiation induced salivary gland toxicity in HNSCC patients.

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