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Biomarker predictors of radiotherapy response in head and neck tumors

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Biomarker Predictors of Radiotherapy Response in Head and Neck Tumor

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Biomarker is defined as a molecule, a substance or process that is altered qualitatively or quantitatively as a result of a precancerous condition or cancer, detectable by a laboratory test in blood, body fluids or tissues. Biomarkers are useful in the diagnoses process, histological identification and therefore may contribute to the correct staging and further patient management.

In head and neck tumors many biomarkers have been utilized as predictors of radiotherapy response. In a study conducted at the Oncology Institute of Havana from March 2014 to June 2016, a set of biomarkers (EGFR, Ki67, Bcl2 and P16) have been studied in a group of patients that received radiotherapy for head and neck cancer.

The main goal was to recognize the relation between tumor response and expression of biomarkers. It has been reported that a positive EGFR, Ki67 and Bcl2 are associated with tumor progression, poor survival and more aggressive tumor.

At the moment of this report, a total of fifty (50) Head and Neck (mesopharynx) patients that needed Radiotherapy have been included in this study upon informed consent. The abovementioned biomarkers were evaluated for all cases. The tumor biopsy was acquired and analyzed by the immunohistochemical Lab of the Institute and the results were available before the radiation treatment started.

All the patients were treated with 6 MV photons IMRT, based in the use of few static segments of fairly large areas, no less than 3x3 cm, and a reasonable dose per segment (> 3 MU). In the treatment planning system the weight of the segments is found using Cimmino's algorithm. The irradiation beams setup was chosen with 9 co-planar equally spaced beams distributed around the patient. All patients were immobilized with the 5 points standard mask for head and neck used regularly at the department.

The current status of the 50 patients is presented in Figure 1. Most of patients (72%), had a complete response to radiotherapy treatment, among them 41.6% expressed P16. The group of patients with the combination of: P16+, EGFR-, Ki67>20 and bcl2- shown a better response to radiotherapy than the patients with P16-, EGFR-Ki67>20 y bcl2+ combination. from this second combination 36% of patients had partial response (see Table 1)

Given that all the histologies were classified as squamous carcinoma, it is surprising, however that the EGFR was positive only in the 6% of the cases.

The use of predictor biomarkers in radiotherapy is an essential tool in the prognosis of the patient response to the treatment and the probability of tumor control. In low resources clinics, the identification of the higher impact biomarkers may contribute to optimize the procurement process.

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