Dendritic Cell Behavior After Radiotherapy Of The Larynx

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INTRODUCTION

It has been known for a long time that the immune system is active in preventing cancer growth in the body. The T lymphocytes are the cells that make up the defense against cancer. Their activation requires antigen-presenting cells, namely dendritic cell (Langerhans cells) and macrophages. New work has established that dendritic cells induce potent protective immunity and therapeutic efficacy against tumors in animal models. Langerhans cells infiltration is preferentially related to tumor of the skin, larynx, breast, and others.

ABSTRACT

Objectives: To evaluate the Langerhans cell infiltration (LCI) in laryngeal tissues before and after radiotherapy. The study included 33 patients with laryngeal tumors treated with surgery and LCI was determined with the streptavidin – biotin method. Histopathologic examinations were carried by two different pathologists on biopsy sample (before radiotherapy) and on tumor (after radiotherapy) and on tumor. The difference between the groups was statistically significant. The LCI was lower after surgery. Statistically, the significance level was taken as p<0.05.

RESULTS

Langerhans cell infiltration was determined as +2 in 10 (30.3%), patients, as +1 in 18 (54.5%), as +0 in 3 (9.1%), and +3 in 2 (6.1%) patients before treatment. After surgery, 7 (21.2%) patients were +0, 8 (24.2%) were +1, 3 (9.1%) were +2 and 8 (24.2%) were +3 patients. We observed an increase of the cell count on the +2 and +3 group, compared to the +0 and +1 group. This difference was statistically significant (p=0.0083). Of the 33 laryngectomies, 11 were negative for the presence of tumor. (Table 3). The cell infiltration was lower when compared to the group with residual tumor on the larynxectomy (table 4). The group without residual tumor (100%) had less (<0.5) cell infiltration as compared to the group with residual tumor. In this group, 81.8% had high (>2.3) cell infiltration.

Antigen presenting cells, namely Langerhans cells, infiltration has been previously shown in laryngeal cancer. Several reports found significant correlation between cell infiltration and locoregional recurrence, node metastasis and disease free-survival. Radiotherapy may induce a more potent anti-tumor immune response. This immune response is dependent on the maturity of the dendritic cells.

METHODS AND MATERIALS

Retrospective review of 107 patients with a diagnosis of squamous cell carcinoma of the larynx, treated between January 1990 and January 1993, in the Department of Otorhinolaryngology Head and Neck Surgery, of the Section of Otorhinolaryngology of the Hospital of the North of Portugal. Of these patients, 33 were treated with radiotherapy as primary intention and salvage surgery for local recurrence. The cell infiltration of this 33 patients was determined by the LCI, before radiotherapy and after the laryngectomy specimen. Thus, two tests were used for statistical analysis. The chi-square test was used for statistical analysis. The significance level was taken as p<0.05.

REFERENCES


DISCUSSION

Radiotherapy has been reported to upregulate the expression of adhesion molecules, costimulatory molecules and heat shock proteins in tumors. It is expected that increased infiltration of functional mature dendritic cells to the tumor. In addition, radiation was found to induce apoptosis in some tumor cell lines. Dendritic cells (DCs) can efficiently acquire antigen from the apoptotic machinery (tumor apoptosis), to upregulate the expression of adhesion molecules, costimulatory molecules and heat shock proteins in tumors.

RESULTS

Langerhans cell infiltration was determined as +0 in 7 (21.2%), patients, +1 in 8 (24.2%), +2 in 3 (9.1%) and +3 in 8 (24.2%) patients. We observed an increase of the cell count on the +2 and +3 group, compared to the +0 and +1 group. This difference was statistically significant (p=0.0083). Of the 33 laryngectomies, 11 were negative for the presence of tumor. (Table 3). The cell infiltration was lower when compared to the group with residual tumor on the larynxectomy (table 4). The group without residual tumor (100%) had less (<0.5) cell infiltration as compared to the group with residual tumor. In this group, 81.8% had high (>2.3) cell infiltration.

The objective of this work was to evaluate the role of Langerhans cell infiltration in laryngeal tumors before and after radiotherapy. The study included 33 patients with laryngeal tumors treated with surgery and LCI was determined with the streptavidin – biotin method. Histopathologic examinations were carried by two different pathologists on biopsy sample (before radiotherapy) and on tumor (after radiotherapy). The difference between the groups was statistically significant. The LCI was lower after surgery. Statistically, the significance level was taken as p<0.05.

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