

EP-2164 Pilot Study: Systemic response after lung SBRT analyzing immune Cells phenotyping

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Purpose or Objective

To investigate changes of immune-phenotyping values in patients treated with Stereotactic Body Radiation Therapy (SBRT) over the lung in order to evaluate the immune response after radiation therapy.

Material and Methods

From November 2016 to May 2018, 7 patients (p) with 7 lung lesions were enrolled in a translational sub-study. All of them underwent SBRT treatment.

Peripheral blood samples prior to the treatment for each patient (1month, 3 months and 6 months) were collected and analyzed. Peripheral mononuclear cells (PBMCs) were isolated from a heparinized venous blood sample by density gradient centrifugation. After centrifugation, PBMCs were collected from the plasma-Ficoll interphase and used for flow cytometry.

Three panels were used:

- Lymphocyte Phenotyping DuracloneTM, Beckman Coulter: CD16 Ab , CD56 Ab, CD19 Ab, CD14 Ab, CD4 Ab, CD8 Ab, CD3 Ab, CD45 Ab

- Regulatory T cells DuracloneTM, BeckmanCoulter: CD45RA Ab, CD25 Ab, CD39 Ab, CD4 Ab, Intracellular FOXP3 Ab, CD3 Ab, Helios Ab, CD45 Ab

- Myeloid Derived Suppressor Cells (MDSC) DuracloneTM, BeckmanCoulter: CD45, HLA-DR, CD14, CD33, CD11b.

Cell surface and intracellular staining were performed according to the manufacturer's protocols. Cell phenotypes were evaluated using the FACS Navios system (BeckmanCoulter).

Results

Median age was 73r (65-80). 5 Males and 2 females. Primary lung tumor 5 cases, 1 CRC and 1 breast primary. None were a candidate to undergo surgery after evaluation in a multidisciplinary tumor board. Locations were: 2p right upper lobe, 3p right inferior lobe and 2p right medium lobe. Following the clinical protocol doses delivered were 60Gy (7.5Gy x 8fr) in 3p y 50Gy (12.5Gy x 4 fr) in 4 p. Mean follow up of 16 months r(2-20), 1p incomplete response, 2p in partial response and 4 in stable .

Lymphocyte Phenotyping showed that Natural Killer cells defined as CD56+high CD16+ , increased among the follow up with initial values of 0.95% to 1.38% at 6 months. Statistical analysis using Friedman Test (p=0.18) and Wilcoxon test don't showed significant differences.

Regulatory T cells activated defined as (CD4+-CD25+Foxp3 +CD45RA) showed stable values during the follow up (baseline values 4.97% vs. 4.46% at 6 months). No statistical differences were detected.

Myeloid-derived suppressor cells (MDSC) CD33+CD11b+CD14-, showed a tendency to lower values during the follow up (basal 62.6% vs 66.1%). No statistical significance was detected.

Conclusion

High doses of radiation therapy over the lung can provide a systemic effect detected in peripheral blood samples. Even the small sample size, our study shows an increase of stimulatory immune populations with stability or decreasing suppressive populations.