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Increased numbers of cells with the phenotype of myeloid-derived suppressor and regulatory T cells in children with acute lymphoblastic leukemia

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Acute lymphoblastic leukemia (ALL) is the most common cancer diagnosed in children. The precise mechanism behind the relapse in this disease is not clear. One possible mechanism could be the accumulation of regulatory cells including myeloid-derived suppressor cells (MDSCs) and T regulatory cells (T_{regs}), which we and others have reported to mediate suppression of anti-tumor immune responses. In this study, we aimed to analyze the numbers of these cells in a group of Egyptian B-ALL pediatric patients (n=45). Using multiparametric flow cytometer, MDSCs and T_{regs} cells were defined as Lin^{-} $HLA\text{-}DR^{-}CD33^{+}CD11b^{+}$ and $CD4^{+}CD25^{+}CD127^{-/low}$, respectively. B-ALL patients showed significant increases in the numbers of MDSCs and T_{regs} when compared to healthy volunteers. During induction of chemotherapy, the numbers of these cells were increased and decreased, respectively. After induction of chemotherapy, the numbers of MDSCs and T_{regs} cells were significantly higher and lower, respectively, as compared to the healthy controls. Our results indicate that B-ALL patients harbor higher numbers of both MDSCs and T_{regs} cells and these levels are changed after chemotherapy. This pilot study opens a new avenue to investigate the mechanism mediating the emergence of these cells on larger number of B-ALL patients in particular during and after chemotherapy.

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Radiation treatment of mediastinal lymphoma with method of the synchronization for breathing and dose evaluation in the heart

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Cardiovascular diseases (CVD) and cancer are one of the leading causes of mortality in the world. Radiation therapy of the mediastinum is one of the cases of CVD. Over last 10 years of diagnostic and treatment methods have increased lifetime of the patients. Since, mediastinal lymphoma has positioning near the heart and radiation dose captures it, the risk is greatest in young patients (up to 40 years), who undergo radiotherapy and in the subsequent, they have mortality due to cardiac complications within first five years after the exposure. The interval between exposure and development of pathologists usually exceeds 7-10 years. Mediastinal lymphoma is "mobile region" and when the patient is breathing "target" is shifting. That is very important thing- breath (or movement of the chest wall), which can change "target position" about critical structures (heart, lungs, spinal cord, and esophagus). That is way, the procedure irradiating of mediastinal lymphoma without breathing control has high risk. Using radiotherapy treatment with breath-holding system, for example, Active Breathing Coordinator system-ABC, is advanced method. It can reduce radiation dose to the heart. We did research in our clinic and used ABC and Elekta Axesse linac for treatment of mediastinal lymphoma. We got very good results which were based on dose distribution to the heart, not more than 17 Gy, regardless from lymphoma positioning and size. It is very good indicator, exceptionally for patients with cardiac disease.

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