Baseline evaluation of cardiac function and volumes in patients undergoing hematopoietic stem cell transplantation and relation to prior use of anthracyclines

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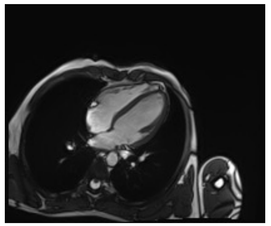
Objective

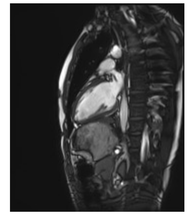
To evaluate the relation between left ventricle (LV) function, end diastolic volume (EDV) and prior use of anthracyclines (doxorubicin) in baseline cardiac evaluation of patients before undergoing hematopoietic stem cell transplantation (HSCT).

Methods

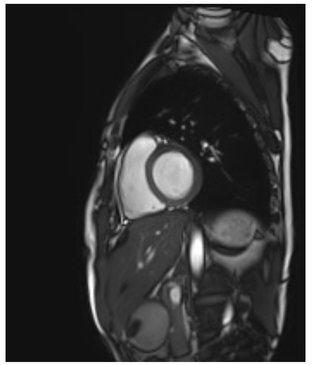
Data of 21 patient undergoing autologous or allogenic hematopoietic stem cell transplantation at the Department of Oncology and Hematology in the Hospital of Lithuanian University of Health Sciences Kaunas Clinics between 2021 October and 2022 April was evaluated. Bioethics approvement for prospective study was obtained (No BE-2-96). Cardiac evaluation including ECG, echocardiography, cardiovascular magnetic resonance (CMR), troponin I and BNP levels was performed before the stem cell mobilization. CMR was performed using 3T MRI Siemens Magnetom Skyra, volumetric analysis was evaluated using Medis Suite 3.2. The patients were divided into two groups: one with prior chemotherapy regimens including anthracyclines and the other without anthracyclines. SPSS statistics 20 was used for statistical analysis. Qualitative data is presented as absolute value (N) and percentage (%), quantitative parameters are given as average (m ± standard deviation). We used Student t test to compare averages of quantitative parameters. Statistically significant difference was considered, when $p<0.05$.



MRI cine sequence. 4 chamber view



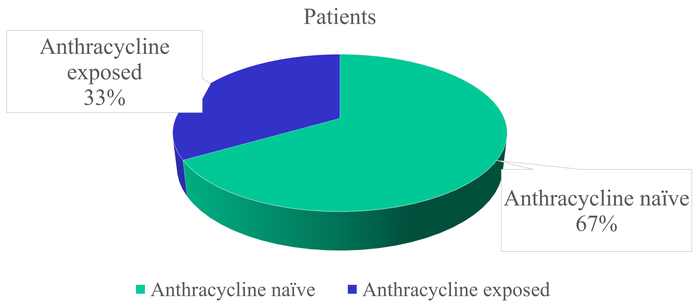
MRI cine sequence. 2 chamber view

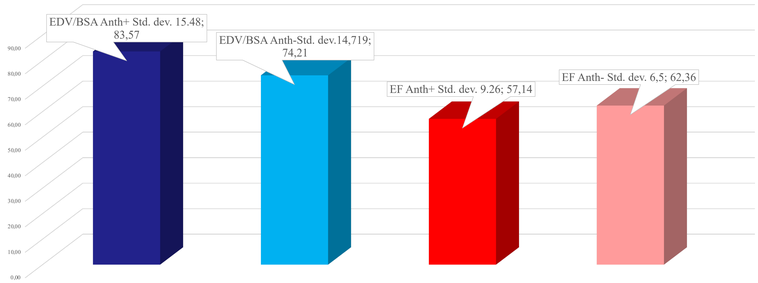


MRI cine sequence, short axis view

Results

Data of 21 patient was evaluated. 7 patients (33,3%) received prior chemotherapy with anthracycline and 14 (66,7%) without anthracycline. We found that in the first group left ventricle end diastolic volume corrected to body surface area (LV EDV/BSA) was bigger than in the second group (83,6ml/m2 ± 15,5 vs 74,2ml/m2 ± 14,7). LV ejection fraction (EF) was smaller in the first group receiving chemotherapy including anthracycline (57,1% ± 9,3 vs 62,4% ± 6,5). Both values were statistically not significant (p = 0,193 and 0,149 respectively).





Conclusions

Patients before HSCT with prior chemotherapy regimens including anthracyclines tended to have bigger LV EDV/BSA and lower LV EF compared to patients with prior chemotherapy without anthracycline. We assume that statistical significance was not obtained due to small number of patients tested.

Key words

Cardiac function, hematopoietic stem cell transplantation, anthracyclines