The Evaluation of Cardiac Functions by Tissue Doppler Imaging in Childhood Leukemia Survivors in Remission

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Objectives: Improvement in long-term survival in patients with acute childhood leukemia has emerged the need to monitor chemotherapy related morbidity and mortality. The aim of this study was to evaluate cardiovascular status of children with acute leukemia and in remission, by using tissue Doppler imaging (TDI). Methods: Sixty patients diagnosed with acute leukemia and in remission for at least two years and 30 healthy children were evaluated by conventional echocardiography and TDI. Results: The median age of patients was 11.7 (10-14.9) and remission time was 4 (2.5-5) years. The median EF was found to be significantly reduced in patients than in control group (69 vs 73%), although EF of all patients were in normal range. Myocardial velocities were significantly lower in patients at basal segments of the myocardium. The median Sm velocity was 6 vs 8 cm/s at interventricular septum (IVS), 6 vs 8 cm/s at left ventricle (LV), and 10 vs 12 cm/s at right ventricle (RV). The median Em velocity was 12 vs 15 cm/s at IVS, 15 vs 17 cm/s at LV, and 15 vs 16 cm/s at RV. The median Am velocity was 5 vs 7 cm/s at IVS, 6 vs 7 cm/s at LV, and 7 vs 10 cm/s at RV. TDI also revealed significantly shortened ICT at all basal segments and IRT at basal IVS in patients. The median ICT was 70 vs 80 ms at IVS, 70 vs 92 ms at LV, and 63 vs 87 ms at RV. The median IRT was 59 vs 63 ms at IVS. Conclusions: The significant decreases in myocardial velocities Sm, Em and Am at all segments are the signs of decreased systolic contraction, delayed relaxation and restriction of the myocardium, respectively. However, the significant shortenings in ICT and IRT do not suggest an obvious systolic and/or diastolic dysfunction. The periodic assessment of leukemia survivors for cardiac disease is mandatory because of the risk of symptomatic cardiac disease years after chemotherapy. TDI seems to give more and early information than conventional methods.