Growth-differentiation factor-15 and tissue Doppler imaging in detection of anthracycline induced cardiomyopathy in during therapy of childhood cancers

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Abstract
Objectives: The aim of this study was to evaluate the importance of growth-differentiation factor-15 (GDF-15) levels and tissue Doppler imaging (TDI) in the early detection of anthracycline-induced cardiomyopathy during the treatment of childhood cancers.

Patients and Methods: Twenty patients (13 males and 7 females) newly diagnosed with childhood cancer whose treatment protocol included anthracycline were included in the study.

Echocardiography, including M-mode, pulse Doppler and TDI, was performed after the first anthracycline treatment at cumulative doses of 100, 200 and 300 mg/m² and at least 6 months after the last treatment. Growth-differentiation factor (GDF-15) and troponin-I were also measured at these time points.

Results: The median age of the patients was 14 years (range, 3–18 years). The median cumulative anthracycline dose was 220 mg/m² (range, 60–400 mg/m²). Conventional pulse wave and pulse wave tissue Doppler methods revealed significant differences in the right ventricular myocardial performance indices of the patients who received cumulative anthracycline doses of 300 mg/m² compared to their indices at least 6 months after the last treatment. The serum GDF-15 levels after the cumulative anthracycline dose of 200 mg/m² were also higher than the patients’ pre-treatment levels.

Conclusion: Doppler/TDI and GDF-15 levels may be used in the early determination of anthracycline-induced cardiomyopathy during the treatment of childhood cancers.

Key words: anthracycline cardiotoxicity; tissue Doppler imaging; growth-differentiation factor-15; children.