Title: Cardiotoxicity predictors for in patients with osteosarcoma under chemotherapy: GDF15 and speckle tracking echocardiography

Category: Heart Failure and Cardiomyopathies

Abstract

Background: Left ventricular (LV) dysfunction is common in patients with osteosarcoma receiving standard chemotherapy. Early detection of this cardiotoxicity is crucial for increase incidence of improving cardiac function. Growth differentiation factor 15 is a new biomarker, which is increased in cardiovascular disease.

Patients and methods: 100 child with osteosarcoma and 100 healthy child was enrolled in this study all study population was assigned for measurement of LV longitudinal strain by 2D speckle tracking echocardiography and LVEF (Left ventricle Ejection Fraction%) at baseline, Then the studied patients was followed up at the tenth and 20th and 29th weeks of the protocol, and then 3 months follow up after the completion of the treatment protocol.

Results: The mean LVEF decreased during study by about 4.4%(from 68±4% to 65±6%); P=0.002) over the duration of the study. Twenty patients (20% of the entire cohort) developed CREC-defined cardiotoxicity. There was no difference in the baseline clinical characteristics of the patient who developed cardiotoxicity compared with the ones who did not. Significant negative correlation was found between LVEF % with GDF and Average strain (-0.75, P<0.001; -0.71, P<0.001 respectively). On the other hand a significant positive correlation was found between GDF and Average strain (0.90, P=0.001). Average strain measured at completion of the treatment was predictive of the development of cardiotoxicity based on the receiver operating characteristic curve

Conclusion: Average longitudinal strain of LV measured by 2D STE, and GDF 15 can predict cardiotoxicity early. Average strain ≥-14 is associated with persistence reduction of EF even after end of the treatment protocol and receiving cardio-protective drugs.