

**Role of the global longitudinal strain on early diagnosis of anthracycline induced cardiac dysfunction in paediatric patients with acute lymphatic leukaemia**

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**Introduction**

Paediatric patients with acute lymphoblastic leukaemia (ALL) are at high risk of developing cancer therapeutics-related cardiac dysfunction (CTRCD). Global Longitudinal Strain (GLS) has been used as an early predictor of late cardiac dysfunction. The objectives of this study are to demonstrate whether the GLS is feasible in the paediatric age, if it changes before the ejection fraction (EF) and to define whether a therapeutic action based on GLS is useful.

**Methods**

Seventy-seven patients diagnosed with ALL and treated with the Italian AIEOP-BFM ALL 2009 protocol were enrolled. All patients did an echocardiography evaluation at baseline and before every cycle of anthracycline. In our department there are two different follow up clinics: the first follows the new ESC guidelines and uses the GLS in addition to LVEF to estimate LV function (group 1), while the second follows the AIEOP protocol where the EF is the only parameter required (group 2). A value of LVEF <10% from baseline to the lowest normal limit and a GLS > -19% were considered pathologic. GLS of patients in group 2 was calculated from the apical 4 chamber view retrospectively. For every patient three exams were considered: the baseline, the nadir of GLS and stop therapy. Patients with demonstrated cardiac toxicity were treated with carvedilol.

**Results**

Forty-four patients (57%) terminated the two years cancer therapy and 41 completed all the echocardiography assessments. 41 pt were in the first group and 36 in the second group. Overall, none developed CTRCD as per EF, while 19 pt developed a GLS > -19% during the follow up. The EF decreases in both groups between baseline and nadir and remained stable between nadir and stop therapy. The GLS had a similar path in the first phase, but it improved between nadir and stop therapy only in the first group, in which carvedilol was started.

**Conclusions**

CTRCD is relatively frequent during treatment for ALL in childhood. GLS seems to be feasible in the paediatric age and an early marker of subclinical cardiac dysfunction. In the case a beta-blocker is started in response to a pathologic GLS, an improvement was noticed.