The role of conventional echocardiographic parameters on detecting subclinical anthracycline therapy related cardiac dysfunction

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Background: Subclinical anthracycline therapy related cardiac dysfunction (ATRCD) can be detected with speckle tracking echocardiographic image (STE), which is not widely available in Uganda. We aimed to investigate the accuracy, sensitivity and specificity of the two conventional echocardiographic parameters (reduction of mitral annular plane systolic exertion (MAPSE) and reduction of mitral annular peak systolic tissue Doppler velocity (s’)) on diagnosing subclinical ATRCD.

Method and results: 207 cancer patients who underwent anthracycline based chemo therapy were recruited at baseline and followed up until 6 months after ending anthracycline therapy. Comprehensive echocardiographic data were collected at each visits. Global longitudinal strain (GLS) by STE was used as the gold standard diagnostic test to define the case of subclinical ATRCD. Data of the 200 patients who had no evidence of clinical ATRCD were analyzed. 172 (86.0%) were female, with a median age of 42 years and cumulative incidence of ATRCD at the end of anthracycline therapy was 23.5% by GLS criteria. The AUC, cutpoint, sensitivity, specificity, PPV and NPV of reduction of MAPSE were 0.6736 (95% CI: 0.5885, 0.7587), ≥ 2 mm, 74.47% (95% CI: 59.65%, 86.06%), 54.90% (95% CI: 46.66%, 62.95%), 33.70% (95% CI: 24.66%, 43.56%) and 87.50% (95% CI: 79.18%, 93.37%). The AUC, cutpoint, sensitivity, specificity, PPV and NPV of reduction of S’ were 0.6018 (95% CI: 0.5084, 0.6953), ≥ 0.5 mm/s, 61.70% (95% CI: 46.38%, 75.49%), 52.67% (95% CI: 44.36%, 60.87%), 29.00% (95% CI: 20.36%, 38.93%) and 76.14% (95% CI: 72.27%, 88.62%).

Conclusion: The reduction of MAPSE and S’ demonstrated fairly good accuracy, sensitivity and negative predictive value to detect subclinical ATRCD in Ugandan cancer patients. These conventional echocardiographic parameters may serve as screening tools for detecting subclinical ATRCD in resource limited settings.