A novel diagnostic score to differentiate between athlete"s heart and ARVC

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Background: The 2010 Task Force Criteria (TFC), although representing the current gold standard to diagnose arrhythmogenic right ventricular cardiomyopathy (ARVC), have not been tested to differentiate ARVC from the athlete's heart. Furthermore, not all 6 diagnostic categories are easy to obtain.

Purpose: We hypothesized that atrial dimensions are useful to differentiate between both entities. Therefore, we developed a new diagnostic score based upon readily available clinical parameters including atrial dimensions on TTE to help distinguishing the athlete's heart from ARVC in daily clinical practice.

Methods: In this observational study, 37 patients with definite ARVC (from the Zurich ARVC Program) were compared to 68 athletes. Base on ROC analysis, the following echocardiographic, laboratory and electrocardiographic parameters were included in the final score: indexed right/left atrial volumes (RAVI/LAVI ratio), NT-proBNP, RVOT measurements (PLAX and PSAX adjusted for BSA) on TTE, tricuspid annular motion velocity (TAM) on TTE, precordial electrocardiographic T-wave inversions and depolarization abnormalities according to the TFC.

Results: ARVC patients had a higher RAVI/LAVI ratio (1.78 ± 1.6vs0.95 ± 0.3,p < 0.001), lower right-ventricular function (fac:28 ± 9.7vs42.1 ± 4.8%,p < 0.001; TAM:17.9 ± 5.6vs23.3 ± 3.7mm,p < 0.001) and higher serum NT-proBNP levels (491 ± 771vs44.8 ± 50.6ng/l,p < 0.001). Our novel score outperformed the performance of the 2010 TFC using those parameters, which are available in routine clinical practice (AUC95%,p < 0.001(95%CI.91-.99)vs.AUC90%,p < 0.001(95%CI.84-.97). A score value of 7/12 points yielded a specificity of 98% and a sensitivity of 61% for a diagnosis of ARVC.

Conclusions: ARVC patients present with significantly larger RA as compared to athletes, resulting in a greater RAVI/LAVI ratio. Our novel diagnostic score includes readily available clinical parameters and has a high diagnostic accuracy to differentiate between ARVC and the athlete´s heart.

Abstract Figure. Novel clinical score