Echocardiographic assessment in 1578 patients with chronic heart failure
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Introduction.— In patients with chronic heart failure, echocardiography provides important information on the mechanism of heart failure (HF) and defining the severity of the disease. The aim of our study is to identify the echocardiographic characteristics of patients with chronic heart failure (CHF), and to determine the predictors of improvement of echocardiographic parameters.

Materials and methods.— This was a single centre, observational study. We included 1578 patients followed for CHF (heart failure which had lasted for more than 1 year) in Ibn Rochd Center of Cardiology from May 2006 to October 2010. All patients had a complete Doppler echocardiographic examination and all parameters were analysed. During follow-up, we defined an improvement of echocardiographic parameters by an increase of left ventricular ejection fraction ≥ 5% compared to baseline, change in cardiac filling pressures assessed by Doppler echocardiography from restrictive to non-restrictive pattern and decrease of RVSP by more than 20% compared to baseline.

Results.— The mean age of our patients was 64.82 ± 10.12 years (16–100), and 64% were men. CHF was due to ischaemic heart disease in 55%. Mean left ventricular ejection fraction (LVEF; biplane Simpson method) was 35% (10–69%). LVEF was ≤ 35% in 897 patients (57%), 35–50% in 505 patients (32%), and > 50% only in 176 patients (11%). Mean left ventricular end diastolic diameter (LVEDD) was 58 mm (32–89), restrictive mitral inflow was found in 21% of patients and high LV filling pressures in 30% of patients. Pulmonary arterial systolic pressure was more than 35 mmHg in 22% of patients. The predictors of improvement in echocardiographic data were female sex, sinus rhythm and high doses of diuretics.

Conclusion.— Echocardiography is well qualified to meet the growing need for non-invasive imaging in the HF population. In fact, echocardiography provides important data for therapeutic decision-making and improves the outcome of patients with CHF.

Predictors of outcome in 369 patients with heart failure with preserved ejection fraction
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Introduction.— A heart failure with preserved ejection fraction (HFPEF) is present in half the patients with heart failure (HF); the prognosis in more recent studies has been shown to be essentially similar to that of systolic HF. The objective of our study is to define the clinical, biological and echocardiographic predictors of outcome in patients with HFPEF.

Patients and methods.— We included 1548 patients, admitted in Ibn Rochd Center of Cardiology from May 2006 to October 2010. HFPEF was defined as LVEF B8805; 45% and receiving a loop diuretic for breathlessness. All patients were evaluated clinically with monitoring of blood pressure (BP), 6-min walk test and electrocardiogram. Two-dimensional echocardiography and laboratory tests were performed in all patients.

Results.— Of 1548 patients, 369 (24%) had HFPEF; the median age was 66 years (42–94) and 61.9% were men. 49.2% of the patients were hypertensive and 33% were diabetic, and 61.9% were in NYHA class II, and 23.8% were in NYHA class III. The median of 6-min walk test was 118 m. The mean LVEF was 49% (45–74). Hypertensive (44.4%) and ischemic heart disease (17.46%) remain the two most frequent etiologies. During a median follow-up of 32 months, mortality was 16%. By univariable analysis, NYHA class; 6-min walk distance; atrial fibrillation and systolic pulmonary artery pressure (sPAP) were associated with an adverse prognosis.

In multivariable analysis, increasing age, NYHA class, and renal failure were predictors of adverse prognosis; betablockers treatment, increasing Hb and female sex were predictors of a better outcome.

Conclusion.— As several studies, clinical and biological variables were more powerful predictors of outcome in HFPEF than echocardiographic variables which are recommended to identify diastolic function.

Not only E/Ea ratio during exercise but arterial compliance correlates with six-minute walking test in patients with heart failure with normal ejection fraction
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Purpose.— Although heart failure with normal ejection fraction (HFNEF) is a frequent disease, physiopathologic mechanisms are still controversial. We hypothesized that elevated arterial stiffness and impaired diastolic reserve could explain symptoms at exercise.

Methods.— From our heart failure clinic (614 patients), we selected 85 patients with a HFNEF syndrom (ESC 2007 criteria). Thirty-two were on sinus rhythm and could perform an echocardiography at rest and peak exercise with measurement of diastolic transmitral parameters (E and A), and tissue Doppler velocities (early diastolic Ea, and systolic Sa). Central arterial stiffness parameters were assessed noninvasively by tonometry: carotidofemoral pulse wave velocity (PWVcf), central pulse pressure (PP), and Augmentation Index (Alx@75). Distance during a six-minute walking test (6MWT) and a semi-quantitative assessment of peak exercise dyspnea evaluated functional performances.

Results.— Mean age was 76 ± 11 years, with a high prevalence of hypertension (66%). PWVcf was increased at 10 ± 2.3 m/s, and distance at 6MWT was 373 ± 114 m. In univariate analysis, distance correlated with PWVcf (R = –0.82, P < 0.0001), heart rate at rest (R = –0.39, P = 0.045), and E/A at rest (R = –0.48, P = 0.012) but almost at peak exercise (R = –0.61, P = 0.01). Exertional dyspnea correlated with PWVcf too (R = 0.025), and with diastolic and systolic parameters measured at peak exercise (E/A: P = 0.02; Sa: P = 0.014). In multivariate analysis, PWVcf was the strongest predictor of distance at 6MWT, with a lower influence of heart rate, and no significant influence of diastolic and systolic functions.

Conclusion.— In HFNEF, different interlinked mechanisms can lead to functional limitation and dyspnea at exercise, but central arterial compliance and ventricular-arterial coupling impairment play a key role.
Heart failure with ejection fraction is therefore fundamental.

Introduction. — Echocardiography is a key consideration in the management of diastolic heart failure, the measurement of ejection fraction of left ventricle is therefore fundamental.

Objective. — In this work we propose to outline the epidemiological, clinical and echocardiographic findings in patients with diastolic heart failure.

Patients and methods. — Our retrospective study included 44 patients with clinical and echocardiographic evidence of diastolic heart failure with ejection fraction ≥ 45%, who were hospitalized during the period from November 2006 to March 2010 at the therapeutic unit of heart failure of Cardiology, CHU Ibn Rochd, Casablanca, Morocco.

Results. — Of a total of 1200 patients hospitalized with heart failure in unit of heart failure. 3.6% had diastolic heart failure with a male predominance (61%), average age of 65.4 years. The dyspnea was constant (95.2%), patients had heart failure NYHA class I (6%), NYHA class II (37.9%), NYHA class III (44%) and NYHA class IV (7%). Doppler echocardiography was performed in all patients, ejection fraction was measured by the method of Simpson biplane and was ≥ 45% in 44 patients who all had elevated filling pressures of left ventricle. Filling pressures of left ventricle were assessed by the study of mitral inflow by pulsed-wave Doppler, with restrictive filling in 68.1% among patients with E/A ratio > 2, deceleration time × 150 ms and time isovolumic relaxation < 60 ms, the mitral flow was normal with E/A ratio: 1 to 2 in 31.8% of cases. In mitral inflow and annulus tissue Doppler: The E/Ea ratio was ≥ 15 in 88.6% of cases and E/Ea ratio ≥ 9 and ≤ 14 in 11.3% of patients and in this case we have had recourse to the analysis of pulmonary venous flow with an Ar–A duration ≥ 30 ms, the measurement of left atrium volume was ≥ 34 ml/m², and the measurement of pulmonary artery systolic pressure was > 35 mmHg.

Conclusion. — Doppler echocardiography in diastolic heart failure measures filling pressures of the left ventricle and also beneficial to the etiologic and prognostic and follow-up.

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Multiparametric approach to select patients for cardiac resynchronization therapy: Results at 2 years follow-up

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Background and objectives. — Proportion of non-responders to cardiac resynchronization therapy (CRT) is high (≥ 30%).

Echocardiography has been recently shown to predict a CRT-induced improvement in heart failure with a 6 months follow-up. We aimed to verify whether a combination of echographic criteria before CRT is still predictable at a 2-year follow-up.

Methods. — Fifty-five patients with left ventricular ejection fraction < 35% (20 ischaemic, 35 idiopathic), mean age 70.4 ± 10.9 years old, NYHA class III-IV, QRS duration > 120 ms, were resynchronized. Before implantation, various echographic parameters of diysynchrony were evaluated: atrioventricular dyssynchrony (AVD), defined by LV filling time/RR < 40%; interventricular dyssynchrony (IVD), defined by a difference between left and right pre-ejection delay > 40 ms. Various criteria of intraventricular dyssynchrony: overlap between inferolateral or anterolateral end-systole and mitral valve opening (Cazeau); aortic pre-ejectional delay (APED) > 140 ms; using tissue Doppler imaging (TDI) in 4 apical chambers view, maximum difference time to onset (electrosystolic delay) or maximum difference time to peak (electromechanical delay) > 60 ms.

Responders were defined as clear functional improvement and absence of heart failure hospitalization. We then evaluated sensitivity (Se), specificity (Sp), positive predictive value (PPV) and negative predictive value (NPV) of isolated and combined pre-CRT echographic parameters.

Results. — The follow-up was 22.6 ± 6.2 months, and 72% of patients were considered as responders. Three patients died. Prediction of CRT response was poor using 1 echographic criterion, independent of the criterion (Se 24%; Sp 43%; PPV 53%; NPV 42%); combination of 2 criteria was better (Se 30%; Sp 86%; PPV 85%; NPV 49%), while various combinations of 3 criteria were highly specific:

- APED + AVD + Cazeau (Se 29%; Sp 100%; PPV 100%; NPV 29%);
- APED + AVD + TDI (Se 24%; Sp 100%; PPV 100%; NPV 29%);
- AVD + TDI + AVD (Se 30%; Sp 100%; PPV 100%; NPV 35%);
- APED + Cazeau + AVD (Se 11%; Sp 100%; PPV 100%; NPV 30%);
- AVD + Cazeau + TDI (Se 8%; Sp 100%; PPV 100%; NPV 29%).

Conclusion. — Echocardiography is highly predictive of CRT-induced functional improvement at long-term follow-up, if a combination of 3 pre-implant criteria is used.

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Can left ventricular longitudinal function study using 2D speckle tracking predict postoperative atrial fibrillation after aortic valve replacement for aortic stenosis?


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Objectives. — In a series of patients with severe symptomatic aortic stenosis (AS), we sought to assess the value of left ventricular global longitudinal strain (GLS) using 2D speckle tracking to predict the occurrence of atrial fibrillation (AF) after aortic valve replacement (AVR).