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Medical journey and short-term outcome of acute heart failure : the OFICA study

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Aims: OFICA is a nationwide, observational study of characteristics, management and outcome of acute heart failure (AHF) during hospitalization as well as after discharge.

Methods: A single-day snapshot was performed on 12 March 2009 in French public and private hospitals. Investigators were encouraged to include all hospi- talized patients with a diagnosis of AHF, irrespective of the time of admission. Planned hospitalizations and cardiac surgery setting were excluded. Relevant data was recorded about medical journeys and outcome was assessed after discharge.

Results: The survey included 1817 patients (77±13y, 45% females) in 170 centers from cardiology wards (58%) as well as after discharge. Most patients were firstly examined by family doctors (41%) or cardiologist (18%). Mobile medical units were required in 33% of cases and patients were admitted in car- diac intensive care unit in 41% of cases. In-hospital mortality was 8.8%. Most survivors were discharged at home (66%) or in rehabilitation centers (5%) or in nursing hospitals (19%). Patients were followed by family doctors in 63% of cases, private cardiologists in 33% and hospital doctors in 32%; only 5% were included in HF networks or ambulatory HF units. At 3 months, the rate of all- cause death was 17.8% and the rate of hospitalization was 30.9%.

Conclusion: The OFICA survey is a valuable tool for analyzing AHF in the real life because of a large inclusion of unselected patients in different types of hospitals as well as departments. Family doctors play an important role as a first step management before admission as well after discharge while use of rehabilitation centers or HF units is marginal. High rates of death as well as hospitalization are observed in the short-term follow-up.

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Prevalence, determinant and prognostic value of TAPSE in an outpa- tient CHF clinic.

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Background: Few reports exist of the prognostic significance of right ven- tricle function (RV) variables in chronic heart failure (CHF) and the broad range of left ventricle (LV) ejection encountered in clinical practice.

Objective: To determine the prevalence, predictors, and prognostic value of RV function measured by the tricuspid annular plane systolic excursion (TAPSE) in patients with symptoms suggesting CHF.

Methods: Analysis of referrals for diagnosis and management of CHF to a specialist clinic serving a local community.

Results: Of 1547 patients studied, mean (SD) age was 71±11 years, 48% were women, mean LV ejection fraction (LVEF) was 47±14% and median (IQR) TAPSE was 18.5mm (14.0-22.7). LVEF was >45% in 47% and 6% were classified as heart failure. During a median (IQR) follow-up of 63 (41-75) months, overall mortality was 34%. In multivariable analysis, increasing age, NT-proBNP, NYHA class, atrial fibrillation, right atria volume, systolic pulmonary artery pressure (sPAP), lower TAPSE, lower diastolic blood pressure (DBP), lower haemoglobin, diagnosis of COPD, and digoxin and betablocker treatments were all associated with an adverse prognosis but not HF class. A receiver operator curve analysis investigating the relationship between TAPSE and prognosis showed an area under the curve of 0.69 (95%CI (0.64-0.74); p=0.001), with a value of 15.9mm of TAPSE best able to predict outcome. TAPSE<15.9mm was most strongly associated when NT-proBNP was not included in the model with raised in sPAP, DBP, heart rate and with decreased of BMI, eGFR and systolic BP, and presence of atrial fibrillation, ischaemic heart disease and with the severity of mitral regurgitation and S-HF.

Conclusion: In patients with symptoms of chronic heart failure, TAPSE, but not variables related to LV systolic function, was an independent predictor of outcome. This simple measure could be used to stratify patient risk in rou- tine clinical practice.

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Contribution of cardiac MRI to early evaluation and impact on the long term follow-up in acute myocarditis. A 31 cases prospective study.

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Acute myocarditis (AM) diagnosis is a challenge based on the association of clinical and para-clinical criteria. This pathology is thought to favour the evolution towards dilated cardiomyopathy and the occurrence of severe arrhythmias. Three months after the acute episode, re-evaluation including car- diac MRI could help to identify patients at risk for unfavourable evolution. The use of MRI has rarely been investigated in AM prognosis stratification.

Method and results: We report a prospective series of 31 consecutive patients hospitalized for AM: 28 men and 3 women, 33 years old on average, without sign of heart failure. All patients presented with troponin I elevation. Echocardiography showed moderate global left ventricular dysfunction in 6 cases and segmental wall motion abnormalities in 18. MRI performed early after admission never showed myocardial first-pass perfusion defect after gado- linenium injection but subepicardial delayed-enhancement (DE) areas in 29 cases mainly located in lateral segments. Three months after the acute episode, no patient was symptomatic. Echocardiography, Holter monitoring and biological check-up were normal. MRI showed the persistence of DE in 17 cases without wall motion abnormality in the affected segments. The persistence of these latter abnormalities lead to effect an annually clinical examination with an ECG. One patient was lost at further follow-up. Among the other 16 patients, none was symptomatic or displayed ECG abnormalities at 3-year mean follow-up.

Conclusions: at the time of admission, the absence of early perfusion defect at cardiac MRI after gadolinium injection and the subepicardial locali- zation of the DE constitute reliable criteria in favour of AM diagnosis, allowing to rule out an acute coronary syndrome. During the follow-up the persistence of a DE does not allow any prognosis stratification. In our series after a mean 3-year follow-up, it is not associated with any clinical and para- clinical disorder.

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Left ventricular twist in patients with Friedreich Ataxia and normal left ventricular ejection fraction and mass

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Background: Iron deposits, diffuse fibrosis and focal necrosis are found in Friedreich’s cardiomyopathy. We hypothesized that subclinical left ventricular (LV) dysfunction might occur in patients with Friedreich ataxia (FA) who pre- sent with normal LV ejection fraction (LVEF) and mass.

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Methods: Twelve patients with FA (mean age: 36±18 years) and twelve age-matched healthy controls (mean age: 36±17 years) were submitted to standard echocardiography. Short axis basal and apical views were analyzed using speckle tracking software. LV twist was defined as the net difference between the apical and basal rotation.

Results: The two groups did not differ in terms of LVEF (65±4% and 65±6% in patients and in controls, respectively) and in systolic mitral annular velocities (7.6±1.3 cm/s in patients and 8.3±1.2 cm/s in controls). A slightly higher LV mass index (M-mode, American Society of Echocardiography convention) was observed in the patient group (93±23 g/m² versus 86±18 g/m², p=NS). The LV filling parameters did not differ between the 2 groups. However, early diastolic mitral annular velocity (Ea) was lower and the ratio of early transmitral flow velocity to Ea was higher in Friedreich ataxia patients (table). Peak LV twist was significantly reduced in patients as compared to controls, unlike early diastolic LV untwisting (at 5%, 10% and 15% of diastole) which was not significantly different.

Conclusions: In patients with FA and normal LVEF and mass, the detection of a reduction in LV twist and an alteration in mitral annular diastolic velocities suggests the presence of subtle myocardial dysfunction. Evaluation of these parameters may prove useful as outcome measures for the assessment and follow-up of new therapies in the early stages of the disease.

### Table 1

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Friedreich patients</th>
<th>Controls</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>E wave velocity (cm/s)</td>
<td>73±10</td>
<td>73±10</td>
<td>NS</td>
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<tr>
<td>E/A</td>
<td>1.7±0.7</td>
<td>1.95±0.7</td>
<td>NS</td>
</tr>
<tr>
<td>Ea (cm/s)</td>
<td>9.3±1.9</td>
<td>12.1±3.4</td>
<td>0.02</td>
</tr>
<tr>
<td>E/Ea</td>
<td>8.6±2.1</td>
<td>6.6±1.9</td>
<td>0.03</td>
</tr>
<tr>
<td>Peak LV twist (°)</td>
<td>9.2±3.4</td>
<td>12.1±2.4</td>
<td>0.02</td>
</tr>
</tbody>
</table>

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Prognosis value of left ventricular filling pressure by speckle tracking in heart failure patients

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Objective: Increase left ventricular (LV) filling pressure strongly impacts on heart failure (HF) prognosis. Diastolic global strain rate (E'SR) by speckle tracking appears superior to tissue Doppler imaging (TDI) in assessing of LV filling pressure. However, their prognosis value in HF patients has never been compared.

Methods: The study included 120 consecutive symptomatic HF patients (63±16 years, 77% male, LVEF=31±10%, 61% NYHA III-IV). LV filling pressure was assessed by the ratio of early diastolic mitral pulsed Doppler (E) over E'SR by speckle tracking computed from strain rate curves of apical views. E/E'SR was compared to E/E'TDI and the occurrence of major adverse cardiac events (MACE).

Results: E/E' averaged 18.4±11.9 by speckle tracking and correlated with the severity of NYHA functional class (11.4±3.8 vs 18.7±8.1 p<0.02 for class I and class II-IV, respectively), LVEF value (r=0.27 p=0.02), LVEF (r=0.25 p=0.006) and E/E' by TDI (r=0.57 p<0.0001). During the follow-up period (266±177 days), MACE occurred in 47 (38%) patients (15 death, 29 recurrent HF and 4 heart transplantsations). By univariable analysis, E/E'SR and E/E'TDI were associated with the occurrence of MACE. But, only E/E'SR (OR 1.43, p=0.02) and LVEF (OR 0.95, p=0.004) remained associated to outcome by multivariate analysis. Importantly, E/E'SR>18 (optimal cut-off value defined by ROC curves,) was associated with an increase of risk of MACE by 4 (Figure).

Conclusion: LV filling pressure by speckle tracking is superior to TDI to predict outcome in HF patients.

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Atrial dyssynchrony syndrome: an overlooked cause of heart failure with normal ejection fraction

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Introduction: Pathophysiology of heart failure with normal ejection fraction (HFNEF) is still poorly understood. We identified 7 patients with HFNEF associated with interatrial block (IAB) and a particular Doppler mitral inflow pattern.

Methods: The patients were selected during the past 2 years, because they had severe HFNEF, and a short, abruptly terminated mitral A wave. We analyzed their echo-Doppler, hemodynamic and electrophysiological features.

Results: There were 1 male and 6 female patients, mean age was 75 ± 7. Pulsed wave mitral Doppler was restrictive and triphasic, including high velocity E wave, a mid-diastolic “L” wave, and a delayed and shortened A wave (figure). Mean E/A and E/E' ratios were 3.7 ± 1.3 and 23 ± 4, respectively. Mean mitral A wave duration was 98 ± 15 ms compared to 170 ± 24 ms at the tricuspid valve (p = 0.001). TDI study of A' at the lateral tricuspid and mitral annulus showed an interatrial mechanical delay of 110 ± 43 ms. Catheterization showed severe post-capillary pulmonary hypertension: mean pulmonary artery pressure 44 ± 7, wedge pressure 26 ± 5 with a V wave of 49 ± 11 mmHg. Electrophysiologic study showed an interatrial conduction delay of 140 ± 20ms, a normal right atrio-ventricular interval (170 ± 30ms), and a short left atrio-ventricular interval (30 ± 20 ms).

Discussion: All 7 patients exhibited 1) severely raised filling pressures, 2) features consistent with decreased left atrial (LA) compliance, and 3) IAB with a delayed LA systole. We believe that severe IAB may be responsible for a delayed LA activation that occurs against a closing mitral valve, thereby interrupting the active LV filling. Furthermore, the hindered LA emptying may induce pressure overload and increase LA stiffness.

Conclusion: We identified a category of HFNEF patients with a stereotyped presentation, in which IAB could be one major explanation. Whether these patients could be improved by atrial resynchronization deserves further investigation.

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