Stratifying the Arrhythmic Risk in post-Myocardial Infarction patients with preserved Ejection Fraction based on a combined Non- Invasive and Invasive approach.

PRESERVE-EF study

Konstantinos A. Gatzoulis
Associate Professor of Cardiology, University of Athens
Post Myocardial Infarction Risk Stratification for Sudden Cardiac Death in Patients with Preserved Ejection Fraction: PRESERVE-EF Study Design

Konstantinos A. Gatzoulis1, Dimitris Tsachris1, Petros Arsenos1, Polychronis Diaviris1, Sfnyos Sideris1, Emmanouil Dimitriadis3, Michael Ebeling2, Nikolaos Dogram4, Panagiotis Karamitzopoulos6, Nikolaos Flaska5, Konstantinos Litsas1, Panagiotis Eleftheri1, Vasilis Vassiliades3, Antonis Sidiris1, Eleftherios Lliopoullos6, Ioannis Gouvdalinos3, Ioannis Libalos2, Paros Vardas2, Ioannis Kallikazaros2, Christodoulos Stefanadis1

1First Cardiology Division, University of Athens, Hippokration Hospital, Athens. 2State Cardiology Department, Hippokration Hospital, Athens. 3Department of Cardiology, University Hospital of Heraklion, University of Crete. 4Second State Cardiology Department, Evangelismos Hospital, Athens. 5Second Cardiology Division, University of Athens, Attikon Hospital, Athens. 6Cardiology Division, University Hospital of Ioannina, University of Ioannina. 7Third Cardiology Division, Aristotle University Medical School, Hippokration Hospital, Thessaloniki, Greece
Current SCD Research in Preserve EF era

The Greek Team: Asso. Professor K. Gatzoulis

7 Greek Centers

- Hippokration Athinon
- Eyaggelismos Athinon
- Attiko Athinon
- Heraklion Kreta
- Hippokration Thessaloniki
- Ioannina Epirus

Non Invasive markers combined with PVS
Current SCD Research in Preserve EF era

The Greek Team: Asso. Professor K. Gatzoulis

- Mendrinos
- Trahanas
- Xenogiannis
- Vlahos
- Vernardos

7 Centers

1. Hippokration Hospital of Athens, First Cardiology Division, University of Athens
2. Hippokration Hospital of Athens, State Cardiology Department
3. Attikon Hospital, Second Cardiology Division, University of Athens
4. Evangelismos Hospital, Second State Cardiology Department, Athens
5. University Hospital of Heraklion, Department of Cardiology, University of Crete
6. University Hospital of Ioannina, Cardiology Division, University of Ioannina
7. Hippokration Hospital of Thessaloniki, Third Cardiology Division, Aristotle University Medical School, Thessaloniki

7 PhD Candidates:

- Dimitrios Trahanas
- Konstantinos Xenogiannis
- Iosif Vlahos
- Michail Tsimos
- Konstantinos Triantafyllou
Background:

Clinical practice is focused in post Myocardial Infarction patients with an impaired Left Ventricular Ejection Fraction (LVEF) for ICD prophylaxis.

Evidence for the presence of increased arrhythmic risk and SCD in some patients with preserved LVEF>35% as well.
Purpose:

To detect among the post-MI revascularized patients with preserved systolic function and LVEF>40%, those, at increased risk for Arrhythmic SCD.
We introduced a combined Non-Invasive and Invasive Risk Stratification Approach in post-MI patients 40 days after revascularization who had a LVEF > 40% (*Hellenic J Cardiol* 2014;55:361-368).
Non-Invasive Positive

Invasive PRESERVE-EF

30 PVCs/hour
NSVT episode(s) /24 hour
2/3 positive criteria for LPs
QTc:440 ms (♀) or QTc: 450ms (♂),
Ambulatory T wave alternans (TWA) ≥65 μV
SDNN/HRV ≤75 ms
Deceleration Capacity ≤4.5 ms & Heart Rate
Turbulence (HRT) Onset ≥0% and HRT slope ≤2.5 ms

Not

PVS
Results:
8/2015

- 283 pts screened non invasively
- 77/283 pts (27%) at least one positive non invasive marker
- 14/283 pts (4.9%) inducible SVT on PVS.
- 13/283 pts (4.6%) received an ICD
The percentage of the presence of the Non Invasive indices in these 14 patients with positive PVS was as follows:

<table>
<thead>
<tr>
<th>Index</th>
<th>Percentage</th>
<th>Count (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSVT</td>
<td>85%</td>
<td>12</td>
</tr>
<tr>
<td>LPs</td>
<td>64%</td>
<td>9</td>
</tr>
<tr>
<td>VPCs</td>
<td>57%</td>
<td>8</td>
</tr>
<tr>
<td>QTc</td>
<td>29%</td>
<td>4</td>
</tr>
<tr>
<td>DC/HRT</td>
<td>29%</td>
<td>4</td>
</tr>
<tr>
<td>TWA</td>
<td>14%</td>
<td>2</td>
</tr>
<tr>
<td>SDNN</td>
<td>7%</td>
<td>1</td>
</tr>
</tbody>
</table>
Conclusions:

Preliminary data suggest that multifactorial non invasive risk screening may detect a subpopulation of post-MI patients with preserved LVEF under risk for Inducible Ventricular Tachycardia.

Prospective follow up is expected to clarify the extent of ICD activations in this population.
2015 ESC Guidelines for the management of patients with ventricular arrhythmias and the prevention of sudden cardiac death

5.3.1 Risk stratification

Risk stratification in patients with stable coronary artery disease after myocardial infarction with preserved ejection fraction

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>Class</th>
<th>Level</th>
<th>Ref.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PVS should be considered in survivors of myocardial infarction with preserved LV function and otherwise unexplained syncope.</td>
<td>IIIa</td>
<td>C</td>
<td>280–282</td>
</tr>
</tbody>
</table>

LV = left ventricular; PVS = programmed ventricular stimulation.

There is limited evidence from subgroups of large-scale studies that programmed ventricular stimulation is helpful for risk stratification in patients after myocardial infarction with intermediate LVEF values or with an LVEF > 40%. This question is currently being addressed in the ongoing Risk Stratification in Patients With Preserved Ejection Fraction (PRESERVE-EF) trial (NCT02124018).

PRESERVE-EF