Results of the EORP survey VHD II

Bernard Iung
Bichat Hospital and Paris Diderot University
Paris, France

Hellenic Society of Cardiology, Athens, 18 October 2018
Rationale and Objectives

• Valvular heart disease is a leading cause of mortality and morbidity in Europe and the number of patients will continue to grow.

• Management of valvular disease has been subject to a number of changes between the Euro Heart Survey in 2001 and 2017:
  - European guidelines of 2007 and 2012,
  - less invasive treatments: TAVI, transcatheter edge-to-edge mitral valve repair,
  - introduction of a multidisciplinary Heart Team approach.

• Objectives of the EORP VHD II registry:
  - to analyse existing practices in the management of patients with native heart valve disease or any previous valvular intervention,
  - to compare these practices with existing ESC guidelines.
Eligibility Criteria

• Inclusion Criteria:
  ✓ Signed Informed Consent,
  ✓ Aged 18 years or older,
  ✓ Severe native valve disease as defined by echocardiography using an integrative approach according to ESC/EACTS Guidelines 2012, OR
  ✓ Previous intervention on a cardiac valve (percutaneous balloon dilatation, transcatheter intervention, valve repair, valve replacement).

• Exclusion Criteria:
  ✓ Acute infective endocarditis at the time of inclusion,
  ✓ Complex congenital heart disease,
  ✓ Valve intervention study impacting on clinical management.
Design

• Consecutive screening
  ✓ ALL patients presenting to hospital for inpatients
  ✓ Weekly (day chosen by the centre) for outpatients
  ✓ During a 3-month period in each centre

• Choice of clusters to represent diverse type of healthcare structures
  ✓ University / Non-University / Private
  ✓ With / Without cardiac surgery, interventional cardiology

• Recommended number of clusters/centres
  provided by EORP according to country size
7247 patients included
(January-August 2017)
in 222 centres from
28 countries
- 4483 (62%) inpatients
- 2764 (38%) outpatients
Distribution of Valvular Disease

- Native valve disease: 5219 (72%)
- Previous intervention: 2028 (28%)

Aortic stenosis: 2152 (41%)
Aortic regurgitation: 1297 (25%)
Mitral stenosis: 1114* (21%)
Mitral regurgitation: 279 (5%)
Isolated right-sided: 234 (4%)
Multiple left-sided: 143 (3%)

*746 primary MR
348 secondary MR
Distribution of Native Valve Disease

- All native
- AS
- AR
- MS
- MR
- Multiple left-sided
- Isolated right-sided

Euro Heart Survey 2001
VHD II 2017
Swedish National Registry

- Diagnosis of valvular disease (ICD codes) between 2003 and 2010 in the Swedish population (10 million inhabitants)

- Overall incidence 64 per 100 000 pt/yr

- 69% of patients with valvular disease were aged ≥ 65 years

- Incidence of aortic stenosis:
  - 38 per 100 000 pt/yr in men
  - 24 per 100 000 pt/yr in women

(Andell et al. Heart 2017;103:1696-703)
Aetiologies of Native Valve Disease

Euro Heart Survey (2001)

VHD II (2017)
## Patient Characteristics

<table>
<thead>
<tr>
<th></th>
<th>AS</th>
<th>AR</th>
<th>MS</th>
<th>MR</th>
<th>Multiple left</th>
<th>Isolated right</th>
<th>Previous Interv.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Female (%)</strong></td>
<td>43</td>
<td>19</td>
<td>75</td>
<td>44</td>
<td>54</td>
<td>59</td>
<td>21</td>
</tr>
<tr>
<td><strong>HF &lt; 1 yr. (%)</strong></td>
<td>16</td>
<td>11</td>
<td>17</td>
<td>27</td>
<td>24</td>
<td>25</td>
<td>17</td>
</tr>
<tr>
<td><strong>NYHA III-IV (%)</strong></td>
<td>37</td>
<td>19</td>
<td>45</td>
<td>47</td>
<td>50</td>
<td>52</td>
<td>26</td>
</tr>
<tr>
<td><strong>A. Fib (%)</strong></td>
<td>14</td>
<td>6</td>
<td>46</td>
<td>35</td>
<td>30</td>
<td>57</td>
<td>32</td>
</tr>
<tr>
<td><strong>Euroscore II</strong></td>
<td>1.9 [1.1-3.4]</td>
<td>1.0 [0.6-1.9]</td>
<td>1.2 [0.8-2.2]</td>
<td>2.0 [1.0-4.0]</td>
<td>2.3 [1.3-4.7]</td>
<td>2.3 [1.4-4.3]</td>
<td>3.0 [1.6-6.0]</td>
</tr>
</tbody>
</table>
**Euro Heart Survey (2001)**

- Median Age (yrs.)
  - Overall: 66 [55-74]
  - 69 58 58 65 64

**VHD II (2017)**

- Median Age (yrs.)
  - Overall: 71 [62-80]
  - 76 58 59 68 75

- 34% ≥75 years
- 14% ≥80 yrs.

- 53% ≥75 years
- 38% ≥80 yrs.
## Investigations

<table>
<thead>
<tr>
<th></th>
<th>AS</th>
<th>AR</th>
<th>MS</th>
<th>MR</th>
<th>Multiple left</th>
<th>Isolated right</th>
<th>Previous Interv.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TEE (%)</strong></td>
<td>10</td>
<td>24</td>
<td>37</td>
<td>37</td>
<td>21</td>
<td>11</td>
<td>14</td>
</tr>
<tr>
<td><strong>Stress test (%)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- all</td>
<td>3.1</td>
<td>4.3</td>
<td>3.8</td>
<td>3.8</td>
<td>1.5</td>
<td>2.1</td>
<td>2.4</td>
</tr>
<tr>
<td>- NYHA I</td>
<td>6.1</td>
<td>6.1</td>
<td>7.4</td>
<td>8.1</td>
<td>1.7</td>
<td>0.0</td>
<td>1.6</td>
</tr>
<tr>
<td><strong>CT scan (%)</strong></td>
<td>27</td>
<td>21</td>
<td>2</td>
<td>4</td>
<td>16</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td><strong>CMR (%)</strong></td>
<td>0.7</td>
<td>7.2</td>
<td>3.0</td>
<td>3.0</td>
<td>1.0</td>
<td>7.7</td>
<td>1.1</td>
</tr>
<tr>
<td><strong>Coronary Angio (%)</strong></td>
<td>63</td>
<td>44</td>
<td>24</td>
<td>49</td>
<td>54</td>
<td>24</td>
<td>17</td>
</tr>
<tr>
<td><strong>Catheterization (%)</strong></td>
<td>8</td>
<td>5</td>
<td>4</td>
<td>11</td>
<td>10</td>
<td>10</td>
<td>4</td>
</tr>
</tbody>
</table>
## Echocardiographic Findings

<table>
<thead>
<tr>
<th></th>
<th>AS</th>
<th>AR</th>
<th>MS</th>
<th>MR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LVEF ≥ 60%</strong></td>
<td>53</td>
<td>38</td>
<td>57</td>
<td>40</td>
</tr>
<tr>
<td><strong>Valve area (cm²)</strong></td>
<td>0.7 [0.6-0.9] (n=1876)</td>
<td>-</td>
<td>1.0 [0.9-1.2] (n=208)</td>
<td>-</td>
</tr>
<tr>
<td><strong>Mean gradient (mmHg)</strong></td>
<td>48 [40-59] (n=2090)</td>
<td>-</td>
<td>11 [8-15] (n=219)</td>
<td>-</td>
</tr>
<tr>
<td><strong>Regurgitation (%)</strong></td>
<td>- moderate</td>
<td>9</td>
<td>8</td>
<td>91</td>
</tr>
<tr>
<td></td>
<td>- severe</td>
<td>91</td>
<td>92</td>
<td></td>
</tr>
<tr>
<td><strong>ERO (cm²)</strong></td>
<td>-</td>
<td>0.4 [0.3-0.5] (n=115)</td>
<td>-</td>
<td>0.4 [0.3-0.6] (n=630)</td>
</tr>
<tr>
<td><strong>Regurgitant volume (ml)</strong></td>
<td>-</td>
<td>65 [52-80] (n=120)</td>
<td>-</td>
<td>58 [42-70] (n=570)</td>
</tr>
</tbody>
</table>
Indications for Intervention

- AS: Intervention performed (40%), Intervention scheduled (20%), No indication (40%)
- AR: Intervention performed (40%), Intervention scheduled (20%), No indication (40%)
- MR: Intervention performed (40%), Intervention scheduled (20%), No indication (40%)
- MS: Intervention performed (40%), Intervention scheduled (20%), No indication (40%)
- Multiple left-sided: Intervention performed (10%), Intervention scheduled (10%), No indication (80%)
- Isolated right-sided: Intervention performed (10%), Intervention scheduled (10%), No indication (80%)
- Prior Interv.: Intervention performed (20%), Intervention scheduled (20%), No indication (60%)
Concordance with Guidelines

Percentage of patients with class I recommendations for intervention (2012 ESC/EACTS Guidelines) in whom intervention was scheduled or performed.

[Diagram showing the percentage of patients with class I recommendations for intervention for different conditions: Aortic stenosis, Aortic regurgitation, Mitral stenosis, and Mitral regurgitation. The data includes the number of patients, the percentage, and the 95% confidence interval.]
Patients Operated During the Enrolment Period
Single left-sided native valve diseases, n=1435

<table>
<thead>
<tr>
<th>n=</th>
<th>AS 866</th>
<th>AR 93</th>
<th>MS 109</th>
<th>MR 367</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>75 [66-83]</td>
<td>57 [48-69]</td>
<td>56 [44-63]</td>
<td>66 [57-74]</td>
</tr>
<tr>
<td>Female (%)</td>
<td>44</td>
<td>17</td>
<td>77</td>
<td>42</td>
</tr>
<tr>
<td>NYHA III-IV (%)</td>
<td>48</td>
<td>34</td>
<td>52</td>
<td>43</td>
</tr>
<tr>
<td>LVEF ≥60% (%)</td>
<td>54</td>
<td>30</td>
<td>53</td>
<td>43</td>
</tr>
<tr>
<td>Eurosore II</td>
<td>2.0 [1.2-3.5]</td>
<td>1.1 [0.8-1.9]</td>
<td>1.1 [0.8-2.5]</td>
<td>1.9 [1.0-3.7]</td>
</tr>
</tbody>
</table>
Patients Operated During the Enrolment Period
Single left-sided native valve disease, n=1435

<table>
<thead>
<tr>
<th>n=</th>
<th>AS 866</th>
<th>AR 93</th>
<th>MS 109</th>
<th>MR 367</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intervention (%)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mechanical prosthesis</td>
<td>21</td>
<td>39</td>
<td>42</td>
<td>17</td>
</tr>
<tr>
<td>Bioprosthesis</td>
<td>37</td>
<td>31</td>
<td>9.2</td>
<td>14</td>
</tr>
<tr>
<td>Valve repair</td>
<td>0.3</td>
<td>22</td>
<td>3.7</td>
<td>52</td>
</tr>
<tr>
<td>Autograft/Homograft</td>
<td>3.5</td>
<td>6.5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Balloon dilatation</td>
<td>1.5</td>
<td>0</td>
<td>45</td>
<td>0</td>
</tr>
<tr>
<td>Transcatheter</td>
<td>39</td>
<td>2.2</td>
<td>0</td>
<td>17</td>
</tr>
<tr>
<td><strong>Other procedures (%)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tricuspid</td>
<td>0.6</td>
<td>2.2</td>
<td>28</td>
<td>33</td>
</tr>
<tr>
<td>CABG</td>
<td>15</td>
<td>12</td>
<td>4.6</td>
<td>15</td>
</tr>
<tr>
<td>Aortic surgery</td>
<td>4.2</td>
<td>37</td>
<td>0.9</td>
<td>0.8</td>
</tr>
</tbody>
</table>
Conclusion

• High burden of elderly patients.

• Underuse of quantitative methods in regurgitant valve diseases and rare use of stress testing in asymptomatic patients.

• Good concordance between guidelines and indications for interventions, in particular in aortic valve diseases.

• Late referral to interventions, in particular in mitral valve diseases.
The ESC Virtuous Circle on Valvular Heart Disease
VHD II EORP Team

• Prof. Aldo Maggioni, EORP Scientific Coordinator
• Prof. Alec Vahanian, Chair of EORP Oversight Committee
• Mrs. Souad Mekhaldi, Clinical Project Manager
• M. Sébastien Authier, Data Manager
• Mrs. Cécile Laroche, Statistician
• M. Charles Taylor, IT Specialist
VHD II Executive Committee Members

Chair: Pr Bernard Jung, ex-officio Working Group VHD
– Alec Vahanian, Chair of EORP Oversight Committee
– Jeroen Bax, ESC President-Elect
– Michele Debonis, Chairman WG Cardiovascular surgery
– Victoria Delgado, representative of EACVI Councillors board
– Michael Haude, Chairman EAPCI
– Gerhard Hindricks, Chairman EHRA
– Aldo Maggioni, EORP scientific coordinator
– Luc Pierard, Chairman WG VHD
– Bogdan Popescu, Chairman-elect EACVI
– Bernard Prendergast, Past-Chairman WG VHD
– Susana Price, ACCA Chair Education and Training Committee
– Raphael Rosenhek, Past-Chairman WG VHD
– Frank Ruschitzka, Chairman HFA
– Olaf Wendler, WG VHD Nucleus Member
– Stephan Windecker, representative of EAPCI
Thanks to all National Coordinators and Investigators!
Aetiologies of Native Valve Disease

AS | AR | Primary MR | MS | Multiple left-sided

Other
Prior Endocarditis/Inflammatory
Congenital
Rheumatic
Degenerative