Outcome of elderly patients with severe but asymptomatic aortic stenosis

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Conflict of interest

None
Background
Severe Asymptomatic AS in the Elderly

• Aortic stenosis (AS) is increasingly diagnosed in an ageing population

• An increased operative mortality and morbidity is expected in elderly patients and comorbidities are present frequently, making the decision to operate more difficult

• Symptom assessment is difficult in presence of comorbidities

• Elderly patients are underrepresented in most natural history studies on AS
## Background

### Prospective Series on the Natural History of Asymptomatic Severe AS

<table>
<thead>
<tr>
<th>Author</th>
<th>n =</th>
<th>Average age</th>
<th>Vmax (m/s)</th>
<th>AVA (cm²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Otto, 1997</td>
<td>123</td>
<td>63±16</td>
<td>≥ 2.5</td>
<td></td>
</tr>
<tr>
<td>Rosenhek, 2000</td>
<td>128</td>
<td>60±18</td>
<td>≥ 4</td>
<td></td>
</tr>
<tr>
<td>Amato, 2001</td>
<td>66</td>
<td>50±15</td>
<td>≤ 1.0</td>
<td></td>
</tr>
<tr>
<td>Rosenhek, 2004</td>
<td>126</td>
<td>58±19</td>
<td>≥ 2.5</td>
<td></td>
</tr>
<tr>
<td>Das, 2005</td>
<td>125</td>
<td>65±9</td>
<td>≤ 1.4</td>
<td></td>
</tr>
<tr>
<td>Pelikka, 2006</td>
<td>622</td>
<td>72±11</td>
<td>≥ 4</td>
<td></td>
</tr>
<tr>
<td>Monin, 2009</td>
<td>211</td>
<td>72 [63–77]</td>
<td>≥ 3</td>
<td>≤ 1.5</td>
</tr>
<tr>
<td>Rosenhek, 2010</td>
<td>116</td>
<td>67±16</td>
<td>≥ 5</td>
<td></td>
</tr>
<tr>
<td>Kang, 2010</td>
<td>95</td>
<td>63±12</td>
<td>≥ 4.5</td>
<td>≤ 0.75</td>
</tr>
<tr>
<td>Maréchaux, 2010</td>
<td>135</td>
<td>64±15</td>
<td>≤ 1.5</td>
<td></td>
</tr>
<tr>
<td>Lancellotti, 2010</td>
<td>126</td>
<td>67±10</td>
<td>≤ 1.2</td>
<td></td>
</tr>
</tbody>
</table>
Aortic Stenosis in the Elderly

Aims

• To assess the natural history of severe asymptomatic aortic stenosis in a large cohort of elderly patients older than 70 years

• To identify potential predictors of outcome in these pts

• To define possible implications on the scheduling of follow up

• To define possible implications on the timing of intervention
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Patients and methods

• All consecutive patients who were examined in our outpatient clinic for valvular heart disease when they had:
  • severe asymptomatic aortic stenosis (AV Vel ≥4 m/s)
  • Normal left ventricular function
  • and were older than 70 years of age

• Exclusion criteria:
  • Symptoms
  • Additional hemodynamically significant valve lesion
  • Previous cardiac surgery
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Patient characteristics

103 asymptomatic elderly patients according to these criteria

<table>
<thead>
<tr>
<th>Variable</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (female)</td>
<td>51</td>
</tr>
<tr>
<td>Age (years)</td>
<td>77.3±4.8</td>
</tr>
<tr>
<td>Aortic jet velocity (m/s)</td>
<td>4.8±0.6</td>
</tr>
<tr>
<td>Aortic mean gradient (mmHg)</td>
<td>58±17</td>
</tr>
<tr>
<td>Aortic valve area (cm$^2$)</td>
<td>0.7±0.2</td>
</tr>
<tr>
<td>Coronary artery disease n (%)</td>
<td>31 (30 %)</td>
</tr>
<tr>
<td>Hypertension n (%)</td>
<td>79 (77 %)</td>
</tr>
<tr>
<td>Diabetes mellitus n (%)</td>
<td>19 (18 %)</td>
</tr>
<tr>
<td>Hypercholesterinemia n (%)</td>
<td>40 (39 %)</td>
</tr>
<tr>
<td>Baseline logistic EURO-Score (%)</td>
<td>7.2±4.1</td>
</tr>
</tbody>
</table>
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Immobilizing comorbidities

- Osteoporosis, degenerative spinal disease (n=9)
- Arthrosis (n=8)
- History of trauma (n=3)
- Severe COPD (n=3)
- Idiopathic arthralgias (n=2)
- Peripheral artery disease (n=2)
- Rheumatoid arthritis (n=1)
- History of stroke (n=1)
- Reduced general condition (n=1)
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Event-free survival

91 events:
• Indication for aortic valve replacement (82)
• Cardiac deaths (9)

Event-free survival

Years

72%
42%
23%
During follow-up, surgery was indicated in 82 pts (79.6%) because of the following reasons:

- Symptoms (75)
- Severe aortic valve calcification and rapid hemodynamic progression (3)
- Reduced left ventricular function (2)
- Prior to major noncardiac surgery in an asymptomatic patient (1)
- Primary indication for coronary artery bypass grafting (CABG) in another asymptomatic patient (1).

Severe symptom onset (NYHA or CCS Class ≥ 2.5) was found in 32 patients (43% of patients that had developed symptoms) despite close follow-up.

71 of these patients underwent aortic valve replacement. 11 patients refused surgery.

All patients received a biological valve prosthesis. 16 patients received concomitant aortocoronary bypass surgery.
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Deaths

15 deaths in patients without indication for surgery:

- 9 cardiac deaths: In 4 of these patients, assessment of symptomatic status was obfuscated due to comorbidities
  - Myocardial infarction (2)
  - Cardiac decompensation with rapid deterioration (5)
  - Pneumonia with multiorgan failure (2)
- 5 non-cardiac deaths: trauma (2), stroke (2) pancreatic cancer (1) and
- 1 unknown death

In addition, 8 of the 11 patients who had refused surgery despite the development of progressive symptoms died after an interval of 2.5 (IQR 0.5 – 4.4) years: Cardiac decompensation (7) and sepsis (1)
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Surgical Outcome

- There were five perioperative deaths: Aortic dissection (1), pneumonia (3), SIRS (1).

- 2 deaths in the early postoperative period (1 to 3 months after surgery): myocardial infarction and multiorgan failure (1) and bilateral pneumonia (1).

- 14 late postoperative deaths: cardiac decompensation (5), prosthetic valve endocarditis (1), myocardial infarction (1), pulmonary embolism (1), mediastinal carcinoma (1), metastatic colon carcinoma (1), trauma (2), unknown (2).

Postoperative survival rates were 89±4%, 81±5%, 77±6% and 69±7% at 1, 2, 3 and 4 years respectively.
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Event-free survival according to peak aortic jet velocity

Event-free survival

p = 0.0007

AV-Vel 4 - 5 m/s

AV-Vel ≥ 5 m/s

p = 0.0007

Years

1

2

3
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Event-free survival according to age at baseline

Age < 80 y

Age ≥ 80 y

\( p = 0.8 \)
## Aortic Stenosis in the Elderly

### Predictors of outcome

<table>
<thead>
<tr>
<th>Variable</th>
<th>Univariate</th>
<th></th>
<th>Multivariate</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>p</td>
<td>Risk Ratio</td>
<td>p</td>
<td>Risk Ratio</td>
</tr>
<tr>
<td>Low systolic blood pressure</td>
<td>n.s</td>
<td>0.5 (0.3-0.7)</td>
<td>n.s</td>
<td>0.6 (0.4-0.9)</td>
</tr>
<tr>
<td>High blood pressure</td>
<td>0.0007</td>
<td>2.1 (1.3-3.2)</td>
<td>0.0007</td>
<td>2.1 (1.3-3.2)</td>
</tr>
<tr>
<td>Low density cholesterol</td>
<td>0.008</td>
<td>1.7 (1.0-2.7)</td>
<td>0.03</td>
<td>1.8 (1.1-2.8)</td>
</tr>
<tr>
<td>Hypertension</td>
<td>n.s</td>
<td>0.7 (0.4-1.2)</td>
<td>n.s</td>
<td>0.8 (0.5-1.4)</td>
</tr>
<tr>
<td>Diabetes</td>
<td>n.s</td>
<td>0.7 (0.4-1.2)</td>
<td>n.s</td>
<td>0.8 (0.4-1.3)</td>
</tr>
<tr>
<td>Hypercholesteremia</td>
<td>n.s</td>
<td>1.3 (0.8-2.1)</td>
<td>n.s</td>
<td>1.0 (0.7-1.5)</td>
</tr>
</tbody>
</table>
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Summary

- Elderly patients with severe aortic stenosis, despite being asymptomatic have a very high cardiac event rate and are at increased risk of cardiac death.

- Severe symptom onset is common and the assessment of symptoms may be challenging in the presence of comorbidities.

- Comorbidities making the detection of early symptoms difficult are frequent.

- Surgical outcomes are good and risk stratification based on peak aortic jet velocity is helpful in these patients.

- These findings may be helpful for the timing of surgery in this population.
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Thanks for your attention!