Influence of on call vascular surgery team and off-hour effect in survival after ruptured Abdominal Aortic Aneurysm

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Introduction

• Ruptured Abdominal Aortic Aneurysm (rAAA) is a life-threatening emergency
• Carries a community and in-hospital mortality up to 80%

ESVS guidelines recommended that abdominal aortic aneurysms treatment should be performed in centers with a volume of more than 30 elective cases per annum and that EVAR can be considered an option in the treatment of ruptured aneurysms, provided that the anatomy is favorable and the center is equipped, organized and the team experienced in emergency endovascular procedures.
Introduction

• Identifying prognostic factors like presence of a on call vascular surgery team at first hospital admission or time of hospital admission can change hospital protocols and mechanisms to improve general outcomes

The purpose of this study is to analize the influence of on call vascular surgery team and off-hour admission in survival after rAAA in Catalonia, Spain.
Methods

• Retrospective observational study
• Outcomes of patients undergoing emergent AAA repair
• Data: Catalonia Public Health official registries (based on registration of the minimum basic data set, MBDS)
• We collected age, sex, primary and secondary diagnoses, surgical procedures, vital status at discharge (live or dead) and the time of admission
Methods

• Inclusion criteria:
  – All hospitalization admissions in public health centers in Catalonia
  – January 2008 to December 2017
  – Diagnosis ICD-9-CM codes 441.3 (ruptured aneurysms)

• Exclusion criteria:
  – Diagnostic codes with both Open Repair and EVAR
Methods

Statistical analysis:

• Statistical Package for Social Sciences (SPSS), Version 23
• T-test for independent samples, Chi-square, ANOVA
• P value < 0.05 was deemed to be statistically significant
Results

$n=717$ patients

<table>
<thead>
<tr>
<th>Variable</th>
<th>n (or mean)</th>
<th>% (or SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (mean, years)</td>
<td>75.98</td>
<td>(SD 9.59)</td>
</tr>
<tr>
<td>Sex (Male)</td>
<td>660</td>
<td>92.1%</td>
</tr>
<tr>
<td>Smoking history</td>
<td>156</td>
<td>21.8%</td>
</tr>
<tr>
<td>Alcoholism or other drugs addiction</td>
<td>21</td>
<td>2.9%</td>
</tr>
<tr>
<td>Hypertension</td>
<td>400</td>
<td>55.8%</td>
</tr>
<tr>
<td>Dyslipemia</td>
<td>230</td>
<td>32.1%</td>
</tr>
<tr>
<td>Diabetes Mellitus</td>
<td>96</td>
<td>13.4%</td>
</tr>
<tr>
<td>Coronary disease</td>
<td>126</td>
<td>17.6%</td>
</tr>
<tr>
<td>Chronic renal failure</td>
<td>224</td>
<td>31.2%</td>
</tr>
<tr>
<td>Chronic pulmonary disease</td>
<td>96</td>
<td>13.4%</td>
</tr>
<tr>
<td>Other aneurysms</td>
<td>40</td>
<td>5.6%</td>
</tr>
<tr>
<td>PAD</td>
<td>41</td>
<td>5.7%</td>
</tr>
</tbody>
</table>
Results

rAAA (n=717)

Tertiary vascular centers
n= 561 (78.2%)

- No Surgery
  n= 173 (30.8%)

- Surgery
  n= 388 (69.2%)

Community centers
n= 156 (21.8%)

- No Surgery
  n= 99 (63.5%)

- Surgery
  n= 23 (14.7%)

  Transferred
  n= 34 (21.8%)

  - No Surgery
    n= 11 (32.4%)

  - Surgery
    n= 23 (67.6%)
## Results

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Tertiary vascular centers (n= 561)</th>
<th>Community centers (n= 156)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgery</td>
<td>388 (69.2%)</td>
<td>46 (29.5%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Overall mortality</td>
<td>357 (63.6%)</td>
<td>138 (88.5%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Postoperative mortality</td>
<td>184 (47.4%)</td>
<td>28 (60.9%)</td>
<td>0.085</td>
</tr>
</tbody>
</table>
Results

[Graphs showing data over years for mortality and episode final treatment.]
## Results

<table>
<thead>
<tr>
<th></th>
<th>Time of admission</th>
<th>Day of admission</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Day</td>
<td>Night</td>
</tr>
<tr>
<td>Overall mortality</td>
<td>n</td>
<td></td>
</tr>
<tr>
<td></td>
<td>351/507</td>
<td>144/210</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>69,2%</td>
<td>68,6%</td>
</tr>
<tr>
<td></td>
<td>P</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0,862</td>
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<tr>
<td>Surgery decision</td>
<td>n</td>
<td></td>
</tr>
<tr>
<td></td>
<td>306/507</td>
<td>128/210</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>60,4%</td>
<td>61,0%</td>
</tr>
<tr>
<td></td>
<td>P</td>
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</tr>
<tr>
<td></td>
<td>0,882</td>
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<tr>
<td>Surgery mortality</td>
<td>n</td>
<td></td>
</tr>
<tr>
<td></td>
<td>150/306</td>
<td>62/128</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>49,0%</td>
<td>48,4%</td>
</tr>
<tr>
<td></td>
<td>P</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0,912</td>
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</table>
# Results

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>Open</th>
<th>EVAR</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of center</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community</td>
<td>46</td>
<td>32 (69.6%)</td>
<td>14 (30.4%)</td>
<td><strong>0.037</strong></td>
</tr>
<tr>
<td>Tertiary</td>
<td>388</td>
<td>207 (53.4%)</td>
<td>181 (46.6%)</td>
<td></td>
</tr>
<tr>
<td><strong>Hour of admission</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Day</td>
<td>306</td>
<td>165 (53.9%)</td>
<td>141 (46.1%)</td>
<td>0.457</td>
</tr>
<tr>
<td>Night</td>
<td>128</td>
<td>74 (57.8%)</td>
<td>54 (42.2%)</td>
<td></td>
</tr>
<tr>
<td><strong>Day of admission</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weekday</td>
<td>264</td>
<td>140 (53.0%)</td>
<td>124 (47.0%)</td>
<td>0.287</td>
</tr>
<tr>
<td>Weekend</td>
<td>170</td>
<td>99 (58.2%)</td>
<td>71 (41.8%)</td>
<td></td>
</tr>
<tr>
<td><strong>Mortality</strong></td>
<td>212</td>
<td>142 (59.4%)</td>
<td>70 (35.9%)</td>
<td><strong>&lt;0.001</strong></td>
</tr>
</tbody>
</table>

**Note:** The table compares the results of an intervention study with two different types of centers (Community vs. Tertiary) and different admission times (Day vs. Night) and days (Weekday vs. Weekend). The mortality rate is also compared between the two types of centers.
Conclusions

• Patients admitted to community centers are more usually treated with palliative treatment. Thus, global mortality is higher in these centers.

• However, when operated in community centers or transferred to tertiary hospitals for surgery, mortality is similar to general postoperative mortality.
Conclusions

• No differences observed in terms of mortality or type of surgery in cases admitted on off hour, this could be explained by the presence of on call vascular surgery teams.

• This reinforces the idea that reference centers have trained teams to handle this type of emergencies.