Increased Incidence of Infective Endocarditis after the 2009 European Society of Cardiology Guideline Update: A Nation-wide Study in the Netherlands

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NO CONFLICT OF INTEREST
Introduction


• IE incidence has increased in the USA: significant rise in the incidence of Streptococcus IE since the 2007 guideline revisions\(^1\)

• Prescriptions of antibiotic prophylaxis have fallen substantially and the incidence of IE has increased significantly in England\(^2\)

1. Pandt et all JACC VOL. 65, NO. 19, 2015
Material and Methods

- Collected all insurance registrations between 2005-2011 for IE
- Coded for individual patients, 98% adherence
- Sample of 3 general hospitals (216 patients)
- Segmented regression analysis of the interrupted time series
- Multivariate analysis to determine prognostic factors
Baseline Characteristics

- Nation wide: 5213 patients; 69% Men
- Mean age 67.5 years (22-97)
- 30% prosthetic valve, 5% right sided valve, 8% pacemaker device lead
- 91% positive cultures
  - Staph 36.1% (S. Aureus 30.1%); Strep 37.4% (S. Mitis 8.3%)
- 53% acces point
  - Oropharyngic (13.8%) Cutaneous (10.6%) Urinary (5.6%) Colon (4.6%)
- 39% Surgical intervention for IE
Results

• Significant increase in infective endocarditis from 30.2 new cases per 1,000,000 in 2005 to 62.9 cases per 1,000,000 in 2011 (p<0.001)

• In 2009 the incidence of IE increased significantly above the projected historical trend (Rate Ratio: 1.327, 95% CI: 1.205 - 1.462 p<0.001)
Incidence total population

RR: 1.327, 95% CI=[1.205 - 1.462] p<0.001
Incidence Men

RR: 1.360 95%CI=[1.211-1.529] p<0.001

Time

incidence per 10^6 men

2005 2006 2007 2008 2009 2010 2011
Incidence Women

RR: 1.254 95%CI=[1.053-1.496] p=0.005
Results

- All cause mortality 36.1%: Women 49.3% vs Men 28.2% (p=0.002)
- Mean age at time of death: 76. Mean age surviving patients: 65 (P<0.001)
- Mortality: prosthetic valve IE 66.2% vs native valve IE 37.0% (p<0.001)
Mortality

Table 1. Prognostic Factors Mortality, multivariate analysis

<table>
<thead>
<tr>
<th>Factor</th>
<th>Odds Ratio (OR)</th>
<th>95% CI</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (decreased survival per life year)</td>
<td>OR = 0.95</td>
<td>95% CI [0.93-0.97]</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>Female Sex</td>
<td>OR = 2.35</td>
<td>95% CI [1.29-4.28]</td>
<td>p=0.005</td>
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<tr>
<td>Conservative Treatment</td>
<td>OR = 3.39</td>
<td>95% CI [1.80-6.38]</td>
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### Mortality and Conservative Treatment

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#### Table 2. Prognostic Factors for Conservative Treatment

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<tr>
<td>Female Sex</td>
<td>1.96</td>
<td>[1.06-3.61]</td>
<td>0.031</td>
</tr>
<tr>
<td>Age (per life year)</td>
<td>1.04</td>
<td>[1.02-1.06]</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>
Limitations

• Causality

• Nation wide cohort: limited data

• No data on prescription of prophylaxis
Conclusion

• There has been a steady increase in the IE incidence between 2005 and 2011

• After the introduction of the 2009 ESC guidelines the incidence increased more than expected from previous historical trends

• Age, female sex and conservative treatment are independent prognostic factors for mortality

• Age and female sex are independent prognostic factors for conservative treatment
Thank you for your attention!
Table 3. Prognostic Factors for Adverse Events, multivariate analysis

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<th>Factor</th>
<th>OR</th>
<th>95% CI</th>
<th>p-value</th>
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<tr>
<td>Staphylococcus Aureus Infection</td>
<td>OR = 2.05</td>
<td>95%CI [1.10-3.84]</td>
<td>0.024</td>
</tr>
<tr>
<td>Surgical Treatment</td>
<td>OR = 0.33</td>
<td>95%CI [0.18-0.61]</td>
<td>&lt;0.001</td>
</tr>
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