Differences in risk factors of PM/ICD local infection and lead dependent infective endocarditis in patients qualified for transvenous lead extraction

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Aim of the study

To evaluate the risk factors of isolated local infection (LI) and isolated lead dependent infective endocarditis (LDIE) in patients referred for transvenous lead extraction (TLE).
Isolated local infection - definition

Local infection of device pocket without the presence of either major or minor Duke criterion for infective endocarditis:

• Vegetations,
• Positive blood cultures,
• Pulmonary embolisation,
• Fever >38°C degrees
Local infections - examples

Skin fistula with purulent leak

„Dry” fistula

Ulceration of the skin over device with local inflammatory infiltrate
Local infections - examples

Skin fistula with local inflammatory infiltrate

„Dry” skin fistula

Fistula with total device protrusion
Isolated lead-dependent infective endocarditis - definition

- At least one major with one minor Duke criteria without local sings of infection:
  - Endocardial lead presence with vegetations and fever >38C degrees.
  - Endocardial lead presence with pulmonary embolisation and fever >38C degrees
  - Endocardial lead presence with more than two positive blood cultures with characteristiqu for IE bacteria and fever >38C degrees
Isolated LDIE - examples

LDIE

TTE- visible vegetation 1.5 x 2.1 cm with recurrent pulmonary infections and pulmonary embolisation

TEE- visible vegetation-intracardiac abscess with septic fever
Methods

Retrospective analysis of 1554 TLE procedures with 2571 extracted leads.
Methods-limitations

Modified major Duke criteria for the diagnosis of infective endocarditis

- **Vegetation**
  - LI: 166
  - LDIE: 131
- **Blood cultures – major criteria**
  - LI: 160
  - LDIE: 23
- **Pulmonary embolism**
  - LI: 185
  - LDIE: 77

White parts of the figures = lack of data
Methods-limitations

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Methods

• The remaining parameters were assessed: the patient’s age and gender,
• number of device-related procedures performed before TLE,
• lead number and dwell-time,
• number of non-functional leads.
• Diabetes and renal failure were assessed in the part of population with complete data in the database.
## Results

<table>
<thead>
<tr>
<th>Indication for TLE</th>
<th>LI Group A</th>
<th>LDIE Group B</th>
<th>TOTAL number of infective indications</th>
<th>P value A vs B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of patients</td>
<td>231</td>
<td>152</td>
<td>631</td>
<td></td>
</tr>
<tr>
<td>Female patient</td>
<td>59/231 (25.4%)</td>
<td>55/152 (36.2%)</td>
<td>182/631 (28.8%)</td>
<td>P=0.0651</td>
</tr>
<tr>
<td>Age of patients [mean]</td>
<td>69.7±12.9</td>
<td>64.1±15.6</td>
<td>67.4±14.0</td>
<td>P=0.0007</td>
</tr>
<tr>
<td>Number of leads in the heart</td>
<td>2.00±0.75</td>
<td>2.19±0.94</td>
<td>2.09±0.81</td>
<td>P=0.0688</td>
</tr>
<tr>
<td>Age of leads [mean]</td>
<td>71.4±52.3</td>
<td>86.5±56.9</td>
<td>76.3±53.4</td>
<td>P=0.0201</td>
</tr>
</tbody>
</table>
## Results

<table>
<thead>
<tr>
<th>Indication for TLE</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Number of device-related procedures before TLE</td>
<td>2.23±2.90</td>
<td>2.20±1.48</td>
<td>2.24±2.07</td>
<td>P=0.9352</td>
</tr>
<tr>
<td>Number of non-functional leads</td>
<td>0.23±0.57</td>
<td>0.33±0.70</td>
<td>0.29±0.65</td>
<td>P=0.2384</td>
</tr>
<tr>
<td>Diabetes #</td>
<td>38/198 (19.2%)</td>
<td>34/139 (24.5%)</td>
<td>124/582 (21.3%)</td>
<td>P=0.5082</td>
</tr>
<tr>
<td>Renal failure ##</td>
<td>10/198 (5.0%)</td>
<td>11/139 (7.9%)</td>
<td>34/580 (5.9%)</td>
<td>P=0.4935</td>
</tr>
</tbody>
</table>

# incomplete information in 49 pts (33 pts PI, 13 pts LDIE)
## incomplete information in 51 pts (33 pts PI, 13 pts LDIE)
Picture of the patient with LI

Older patient – mean 70 years old; most frequently male
($\frac{3}{4}$ of group A - males)

Shorter lead dwell time – mean 6 years for one lead; mean of two leads.
Picture of the patient with LDIE

younger patient - mean 64-years old
smaller difference in gender (more than 1/3 women in group B)

longer lead dwell time - mean 7 years for a lead; more than 2 leads for one patient.

Presence of lead loop in the heart and lead abrasion - fenomenon non analysed in this work
Conclusions

• Two variables: patient’s age and lead dwell time correlated with the PM/ICD infection type.

• Patients with isolated LI were significantly older and had shorter lead dwell time in comparison with patients with isolated LDIE.
Thank you for attention