Right-sided infective endocarditis: Tunisian experience

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INTRODUCTION
Infective endocarditis (IE): uncommon condition in general population, with an incidence estimated at 3-10 cases per 100000 persons years.

The right-sided IE: 5% to 10% of all cases of IE.

It is most frequently observed in injection drug users (IDUs) and often associated with intracardiac devices.
- Delays in the diagnosis are frequent.

- Clinical presentation of this IE differs from that of left-sided IE, with respiratory symptoms.

- The prognosis of right-sided IE is better than left-sided IE’s with excellent results of only medical treatment.
PATIENTS AND METHODS

- Retrospective study of right-sided IE, adults (1998-2011)
- Department of infectious diseases, Rabta Hospital, Tunis
- The diagnosis of IE was based on Duke criteria
- Epidemiological, clinical features, and therapeutic findings.

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RESULTS
16 cases of right-sided IE

Isolated Right-sided IE: 10 cases (62.5%)

Associated Left-sided IE: 5 cases (31.2%)

Device related IE (permanent pace maker): 1 case

Nosocomial Right-sided IE: 1 case

Community-acquired Right-sided IE: 15 cases
 Patients characteristics

- The mean age was 37.7 years (14-72 years)
- Male : 13 patients (81%)
  Female : 3 patients (19%), sex ratio : 4.3
- History of intravenous drug abuse : 9 patients (56%)
- Predisposing condition of IE:
  - Fallot’s tetralogy : 1 case
  - Ventricular septal defect : 1 case
  - Rheumatic valvulopathy : 2 cases
  - diabetes mellitus : 1 case
- No patients were HIV-positive
CLINICAL PRESENTATION
The mean delay of diagnostic: 28.4 days (4–120 days)

Bacteremia associated with IE: 8 cases (50%)

Port of entry: 12 cases (75%)
- Intravenous drug use: 8 cases
- Dental cause: 3 cases
- Intravascular catheter: 1 case
- Unknown: 4 cases
<table>
<thead>
<tr>
<th>Signs and symptoms</th>
<th>Number of patients</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever</td>
<td>16</td>
<td>100 %</td>
</tr>
<tr>
<td>Cardiac murmurs:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- murmur of tricuspid regurgitation</td>
<td>11</td>
<td>69 %</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>37.5 %</td>
</tr>
<tr>
<td>Pulmonary symptoms:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Dyspnea</td>
<td>10</td>
<td>62.5 %</td>
</tr>
<tr>
<td>- Cough</td>
<td>8</td>
<td>50 %</td>
</tr>
<tr>
<td>- pleuritic chest pain</td>
<td>4</td>
<td>12.5 %</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>25 %</td>
</tr>
<tr>
<td>Digital cubbing</td>
<td>1</td>
<td>6.25 %</td>
</tr>
<tr>
<td>Splenomegaly</td>
<td>4</td>
<td>25 %</td>
</tr>
<tr>
<td>Peripheral mucocutaneous manifestations:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Splinter haemorrhages</td>
<td>8</td>
<td>50 %</td>
</tr>
<tr>
<td>- Janeway lesions</td>
<td>7</td>
<td>44 %</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>6.25 %</td>
</tr>
<tr>
<td>Heart congestive failure</td>
<td>6</td>
<td>37.5 %</td>
</tr>
<tr>
<td>Embolic cerebrovascular accident</td>
<td>2</td>
<td>12.5 %</td>
</tr>
</tbody>
</table>
Complications and Right-sided IE: 12 (75 %)

- Cardiac impairment: 8 cases (50 %)
  - Right heart failure: 4 cases
  - Left heart failure: 3 cases
  - Pericarditis: 2 cases

- Septic pulmonary embolism: 2 cases (12.5 %)
  - Pulmonary infiltrates: 2 cases

- Pleural effusion: 2 cases
Complications and Right-sided IE

- Embolic cerebrovascular accident: 2 cases (12.5%)
  - Cerebral abscess: 1 case
  - Ischemic stroke: 1 case

- Splenic abscess: 2 cases

- Psoas abscess: 2 cases
Microbiological findings

- Blood culture: positive in 8 cases (50%)
  - *S. aureus* meticilline sensitive (MSSA): 5 cases (62.5%)
  - S. coagulase negative (MR): 1 case (12.5%)
  - *Viridans streptocococcus*: 2 cases (25%)

- Culture of valves (4/16) was negative
Echocardiographic findings (TTE/TEE)

Vegetations : 100%

- Right heart Vegetations : 16 cases
  - Tricuspid valve : 13
  - Pulmonary valve : 3

- Left heart vegetations : 4 cases
  - Mitral valve : 3
  - Aortic valve : 2

- Multivalvular disease : 1 case
  (tricuspid, mitral and aortic valves)

- Pace maker : 1 case
Laboratory findings

- Leucocytosis: 10 cases (62.5%)
- Anemia (Haemoglobin < 10 g/dl): 10 cases (62.5%)
- The erythrocyte sedimentation rate was elevated (greater than 35 mm per first hour): 16 patients (100%)
Treatment

- First ligne antibiotherapy:
  - betalactamin + aminoside in 11 cases (69%).
    * Oxacillin+ Gentamycin : 8 cases
    * Ampicillin+ Gentamycin : 3 cases
  - Vancomycin+ Gentamycin+ Rifampicin : 3 cases
  - Cefotaxim + Fosfomycin : 2 cases

- Mean duration: 53 days (22 – 134 days)
Surgical Treatment: 5 cases (36 %)

- Medical treatment + surgical treatment
  - Annuloplasty of tricuspid valve (TV): 3 cases
  - Vegetectomy: 1 case
  - Annuloplasty of TV + left-sided valve replacement: 2 cases

- Indications of surgical treatment
  - Large size of vegetations: 3 cases
  - Left heart failure with periannular abscess: 2 cases
Outcomes

- **Good outcome**: 14 patients (85%).
- **Death**: 2 patients from septic shock (12.5%).
- **Relapse of right-sided IE**: 2 injection drug users (14%).
DISCUSSION
Incidence of right-sided IE: 5-10%

- Intravenous drug abusers
- Intracardiac devices/pacemaker
- Others predisposing diseases:
  - Immunosuppression
  - Genito-urinary procedures
  - Congenital heart disease
    (Fallot’s tetralogy, ventricular septal defect)
### Risk factors of right-sided of IE

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<tbody>
<tr>
<td>Intravenous drug abuse</td>
<td>74 %</td>
<td>35 %</td>
<td>-</td>
<td>56 %</td>
</tr>
<tr>
<td>Pace maker</td>
<td>-</td>
<td>47 %</td>
<td>-</td>
<td>6.25 %</td>
</tr>
<tr>
<td>Hemodialysis</td>
<td>10 %</td>
<td>18 %</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Immunosuppression</td>
<td>18 %</td>
<td>29 %</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>-</td>
<td>17 %</td>
<td>-</td>
<td>6.25 %</td>
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<tr>
<td>Heart failure</td>
<td>8 %</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Congenital heart disease</td>
<td>-</td>
<td>-</td>
<td>74 %</td>
<td>12.5 %</td>
</tr>
<tr>
<td>Post-operative IE</td>
<td>-</td>
<td>-</td>
<td>26 %</td>
<td>-</td>
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http://www.infectiologie.org.tn
Staphylococcus aureus: most common pathogen

- Robins and al : 80 % (1986)
- Our study : 62.5 %
Difficult diagnostic of right-sided IE

- Its clinical presentation differs from left-sided IE

- Similar presentation of respiratory infection (dyspnea, fever and pulmonary infiltration)

⇒ misdiagnosis
Treatment of right-sided IE:

- Antibiotic therapy of right-sided IE must be covered with *Staphylococcus aureus*, particularly in IVDA or venous catheter-related infection.

- Surgical treatment should generally be avoided in right-sided native IE, particularly in IVDA (higher incidence of recurrent IE due to continued drug abuse).

- Surgical treatment of TV IE:
  
  Study of Revilla and al: 29%
  Study of Bahl and al: 9%
  Our study: 36%
Mortality

- Patients with tricuspid valve (TV) IE have lower mortality than those with mitral valve (MV) or aortic valve (AV) IE.

Retrospective cohort (V. Jain and al):
Mortality: 6.3% (TV IE)
32% (MV IE)  \( (p < 0.0004) \)

CONCLUSION

- Right-sided IE is considered as a differential diagnosis of patients with febrile syndrome, respiratory signs and predisposing factors.

- Users of injection drugs develop right-sided IE much more frequently, with tricuspid valve involvement. So, early diagnosis of IE in these patients is necessary.

- Antibiotherapy must always covers *S. aureus*.

- Surgical treatment is rarely indicated.

- Prognosis appears to be more better than for left-sided endocarditis.