



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.



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

□ Signs and symptoms

Signs and symptoms	Number of patients	(%)
Fever	16	100 %
Cardiac murmurs :	11	69 %
- murmur of tricuspid regurgitation	6	37,5 %
Pulmonary symptoms:	10	62,5 %
- Dyspnea	8	50 %
- Cough	2	12,5 %
- pleuritic chest pain	4	25 %
Digital cubbing	1	6,25 %
Splenomegaly	4	25 %
Peripheral mucocutaneous manifestations:	8	50 %
- Splinter haemorrhages	7	44 %
- Janeway lesions	1	6,25 %
Heart congestive failure	6	37,5 %
Embolic cerebrovascular accident	2	12,5 %

□ **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 streptococcus* : 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

Risk factor for right-sided IE	V. Jain (USA, 2003)	Revilla and al (Spain, 2006)	Bahl and al (India, 1992)	Our study (Tunisia, 2011)
Intravenous drug abuse	74 %	35 %	-	56 %
Pace maker	-	47 %	-	6,25 %
Hemodialysis	10 %	18 %	-	-
Immunosuppression	18 %	29 %	-	-
Diabetes mellitus		17 %	-	6,25 %
Heart failure	8 %	-	-	-
Congenital heart disease	-	-	74 %	12,5 %
Post-operative IE	-	-	26 %	-

□ *Staphylococcus aureus*: most common pathogen

- A.Revilla and al : 41 % (1996-2006)
- V. Jain and al : 57 % (1996-2003)
- 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 cover *S.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) ($p < 0,0004$)

V.Jain, M.HYang and al. Infective endocarditis in an urban medical center.
Journal of Infection 2008; 57 : 132-138.

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.