MINISTRY OF HEALTH OF THE REPUBLIC OF MOLDOVA
STATE UNIVERSITY OF MEDICINE AND PHARMACY
"NICOLAE TESTEMITANU"
DEPARTMENT OF INTERNAL MEDICINE,
DISCIPLINE OF CARDIOLOGY, MEDICAL CLINICS Nr. 3

Alexandra Grejdieru, Liviu Grib, Minodora Mazur

INFECTIOUS ENDOCARDITIS

Methodical elaboration for students, residents, scientific researchers and specialists

Chisinau 2013

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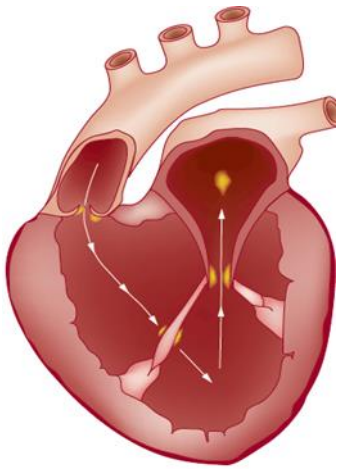
Methodical elaboration is designed for students, residents, scientific researches and medical specialists.

What we want you to know?

- What are the major epidemiological characteristics of infectious endocarditis and how the disease pattern has changed in recent years?
- What changes have occurred in the etiology and pathogenesis of infectious endocarditis and their correlation with different clinical forms of the disease?
- How is diagnosed infectious endocarditis at modern stage and what problems are encountered in establishing early diagnosis?
- What complications develop infectious endocarditis patients and their management?
- What are the basic principles of therapy and prophylaxis of infectious endocarditis?



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Content

Abreviations

SCON	– Stafilococcus coagulazo-negative
MIC	– minimal inhibitorial concentration
MC	– test of the multiple compliment
CCP	– congenital cardiopathies
CT	– computerized tomography
SC	–simple compliment test
ICD	– intracardiac dispositives
EcoCG	– ecocardiography
IE	– infectious endocarditis
IE RH	– infectious endocarditis of the right heart
IE LH	– infectious endocarditis of the left heart
IE IV	– infectious endocarditis of the intact valves
IE NV	– infectious endocarditis of the native valves
IE PV	– infectious endocarditis of the prosthetic valves
TEE	– transesophagian ecocardiography
TTE	– transthoracic ecocardiography
GMN	– glomerulonephritis
HACEK	– Haemophilus, Actinobacillus, Cardiobacterium, Eikinella, Kingella
HC	– haemocultures
CF	– cardiac failure
ARF	– acute renal failure
CRF	– chronic renal failure
SAMR	– Stafilococus aureus meticilin rezisten
CRP	– C reactive protein
NMR	– nuclear magnetic rezonance
RLP	– reaction of the lant polimerisation
SAMR	– staphylococcus aureus meticilino-resistent
CNGS	– coagulasonegative stafilococcus
DV	– degenerative valvulopathies
RV	– rheumatismal valvulopathies
ESR	– erythrocyte sedimentation rate
IVDU	– intravenous drug users

Pretests

1. SC First clinical description of infective endocarditis belongs to:
A. E. Libman
B. W. Osler
C. H. Schottmuller
D. W. Thayer
E. S. Jaccoud

2. SC Specify the rarely affected valve endocarditis:
A. Mitral valve
B. Aortic valve
C. Tricuspid valve
D.Pulmonary artery valve
E. Eustachian valve

3. SC Establish predominant infectious agent in the intravenous drug users infectious endocarditis and in patients with prosthetic valves:
A. Streprococcus virdans
B. β haemolytic streptococcus
C. Staphylococcus aureus
D. Staphylococcus epidermis
E. Enterococcus fecalis

4. SC Treatment of infectious endocarditis includes the following drugs, excepting:
A. Antibiotics
B. Antifungal drugs
C. Cardiac glucosides
D. Anticoagulants
E. B blockers

5. SC Select prophylactic dose of Amoxaciline in patients with high risk of infectious endocarditis developing.
A. 500 mg / day within 2 hours before the dental procedure
B. 500 mg / day after dental procedure
C. 2-3 gr within 1 hour before dental procedure
D. 1 g / day within 2 hours before the dental procedure
E. 500 mg / day in 4 parts

6. SC In patients with history of infective endocarditis to prevent recurrence of a new episode, it allowed teeth removal:
A. 2 teeth daily
B. 3 teeth daily
C. 1 day tooth
D. 1 tooth in 3 days
E. 1 tooth in 10 days

7. SC Name the most common and severe complication of infectious endocarditis:
A. Embolic events
B. Heart failure "oslerianǎ"
C. Glomerulonephritis
D. Encephalitis
E. Toxic hepatitis

8. SC Name the most informative laboratory investigation in infective endocarditis:
A Blood count
B. Ureea
C. C-reactive protein
D. Blood culture
E. Uroculture

Clinical cases for pretestation

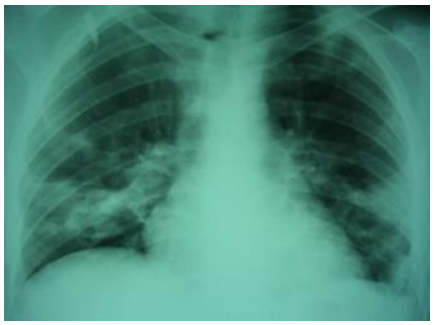
Case 1. The patient C., a man aged 35 years, presents the following complaints: 39-40 ° C fever, chills, night sweats, weight loss – 5 kg during the last week, inspiratory dyspnea in mediun effort, palpitations, dry cough, pastosity in the calves region.

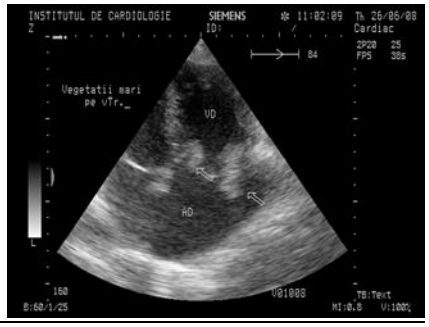
The disease started 2 weeks after a skin infection – furunculosis, with fever, chills, sweating and pain in law hemithorax. The patient used intravenous drugs, for the symptoms described above, by himself he aministrated *Aspirin 500 mg / day.* In serious condition he was hospitialized in cardiology department.

Clinical and laboratory examination revealed: febrile teguments, moist, pale, petechial macular region of the right plant. Reduction of respiratory amplitude hemitoracele law dullness to percussion in the right lower lobe, auscultation: inferior wet rales bilateral. RF – 22 r/min. Rhythmic heart sounds, I attenuated sound in IV p. of auscultation, systolic murmur in the tricuspid valve projection. BP - 120/70 mmHg.

Hemogramma: haemoglobin – 110 g / l , RBC - 3.0 x 10^{12} / l, WBC 10,6 x 10^{9} / l , eozinifiles - 4%, nonsegmented neutrophils - 12%, segmented neutrophils - 48 % , lymphocytes - 27 %, monocytes - 5% , increased ESR - 70 mm / hour.

Thoracic radiography and echocardiogram are presented in the images.





Formulate and argumentate the diagnosis.

What further investigations are needed to establish the diagnosis?

Principles of treatment.

Case 2. Patient G., 70 years old, was presented to the doctor with fever 38 ° C., chills, sweating, moderate inspiratory dyspnea at moderate effort, palpitations, fatigue, loss of weight - 10 kg / month.

The disease began insidiously with low grade fever, moderate inspiratory dyspnea at moderate effort, palpitations over 1 month after prosthesis of mitral valve. After 3 week treatment with the antibiotics: Cefazolin 4 gr / day i/m, without marked improvement in the general state, with fever persistence.

Clinical and laboratory examination: Pale, clean teguments. Symmetrical lung percussion evidentiated normal pulmonary murmur. Pulmonary auscultation area attests vesicular murmur, rales absence, RF - 18 r / min. Heart sounds are rhythmic, prosthesis sound at the apex, FCC - 85 beats / min , BP - 110/70 mm Hg. Language is pink and wet. Enlarged liver (+ 2 cm).

Hemogramma: hemoglobin – 100 g / l, RBC - 2.6 x 10^{12} / l, WBC - 9.2 x 10^{9} / l, eozinifiles - 1%, nonsegmented neutrophils - 9%, segmented neutrophils - 48 % , lymphocytes - 34 %, monocytes - 7% , increased ESR 65 mm / h, anisocytosis.

Formulate and argumentate the diagnosis.

Describe presented EcoCG (as indicated by the arrow) .

What further investigations are necesary for the diagnosis establishing?

TABLE 4. Possible causes of persistent fever in patients with IE

Complications	
	Inadequate antibacterial therapy
Cardiac	Miocardic abcess Paravalvular abcess Big valvular vegetations
Renal	Glomerulonephritis Bacteriuria
Neurological	Cerebral emboli Micotic aneurismas Meningitis
Pulmonary	Pulmonary emboli Exudative pleuresias
Other	Emboli: • Splenic • Articular • Vertebral Infectated venous catheters Alergic reaction on antibiotics

Reserved prognostic factors

I. Patients characteristics

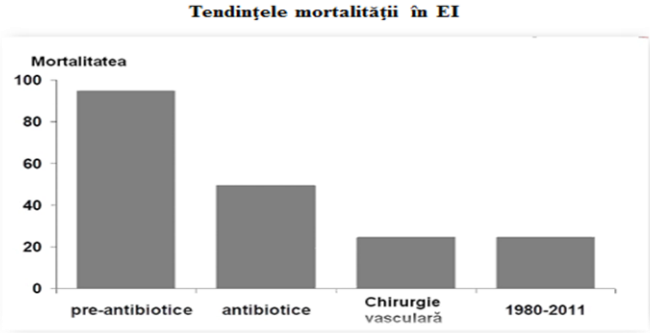
- Old age
- IE of the valvular prosthesis
- Insulin-dependent diabetes
- Comorbidities (general bed feeling, cardiovascular disease, pulmonary or renal concomitent disease)

II. IE complications presence

- Heart failure
- Renal failure
- Vascular accident
  - Septic shock
- Perianular complications

III. Microorganism

- Stafilococcus aureus
- Funghal
- Gram-negative Bacilli
  - **Echocardiography**
  - Perianular complications
- Severe valvular regurgitation of the left heart
- Reduced ejection fraction of the left ventricle
- Pulmunary hypertension
- Masive vegetations
- Severe prothetic disfunction
- Premature clothing of mitral valve and other sighns of diastolic high pressure



Predictors of hospital mortality in IE

Variables	Hazard correlation (95% CI)	p
Age (increases with every 10 years of olderness)	1,45 (1.37- 1,54)	< 0,0001
Masculin sex	0,91 (0,75 – 1,11)	0,36
Diabetus mielitus	1,14 (0,89 – 1,45)	0,30
Chronic renal failure	1,45 (1,13 – 1,86)	0,004
Nosocomial infections	1,62 (1,34 – 1,96)	0,0001
Infection of valvular prosthesis	1,05 (0,80 – 1,38)	0,71
Staphylococcus aureus infection	1,72 (1,37 – 2,15)	0,0001
Enterococcyc infection	0,82 (0,60 –1,13)	0,22
Streptococcyc infection	0,75 (0,57 –0,99)	0,046
Heart failure	1,89 (1,53 –2,35)	0,0001
Severe embolic events	1,69 (1,28 –2,22)	0,0001
Valvular surgery	0,67 (0,50 – 0,90)	0,008