PRESEPSIN IN ER – ROMANIAN EXPERIENCE

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SEPSIS DIAGNOSIS

- WBC

- GERMS NUMBER

- BACTERIAL CULTURE

- CRP (C Reactive Protein)

- BIOMARKERS

IDEAL BIOMARKER FOR SEPSIS

- Difference between Sepsis & SIRS, viral & bacterial infections;

- Rapid "detection" of Sepsis;

- Reflects clinical severity of illness (you can monitorize therapy);

- Great predictive value;

- Stable in different probes;

- Rapid quantification;

BIOMARKERS IN SEPSIS

- CRP (C reactive protein);
- IL-6 (Interleukine 6);
- PCT (Procalcitonin);
- LBP (lipopolysacharide binding protein);

- **PRESEPSIN (sCD14ST).**

Presepsin (pg/ml)	Diagnosis	Atitude
< 200	Sepsis exclusion	No blood culture
< 300	Low probability of systemic infection	More investigations (blood culture included)
>300 < 500	Possible systemic infection (SEPSIS)	Start antibiotic therapy after bacterial culture
>500 < 1000	Moderate risk for SEVERE SEPSIS and unfavorable outcome	Consider surgical treatment (where is possible)
>1000	Major risk for SEVERE SEPSIS / SEPTIC SHOCK , mortality major risk at 30 days (comparable with Apache II score of 25)	„Maximal" therapy

OUR EXPERIECE

INCLUSION CRITERIA:
- Age ≥18 yrs with clinical signs of severe infection requiring blood collection;
- 2 of 4 SIRS criteria:
- Fever >38 C and <36C;
- Heart rate >90 /minute;
- Respiratory rate >20/minute or hyperventilation (PaCO2 <4,3 kPa);
- Leucocitosis > 12.000/ml / leucopenia <4.000/ml or >10% nonsegmented premature granulocytes;

Exclusion criteria:
- Age under 18 yrs;
- No consent;

OUR EXPERIENCE

Blood tests for:

- Presepsin;
- WBC;
- Fibrinogen;
- PCT (procalcitonin);
- Other blood tests – AST, ALT, BUN, creatinine, Na, K etc.

 + ultrasound, X-ray, CT scan etc.

MEDS SCORE

- we used for the sepsis patients evaluation the MEDS score (Mortality in Emergency Department Sepsis);

- Maximum score 27 points;

- the score predicts sepsis patients mortality admitted in ER with SIRS (Sankoff JD et al).

MEDS SCORE	POINTS
Terminal illness (metastatic cancer or other illness that can produce death in 30 days)	6
Tachypnea or hypoxemia (RR >20/min or oxygen saturation <90% or need for supplemental oxygen by either face mask or 100% nonrebreather)	3
Septic shock (PAs<90 mmHg) with volume repletion	3
Trombocytopenia < 150.000 cells/ml	3
Age > 65 yrs	3
Bands, >5% of total WBC count	3
Low respiratory infection (defined as an infiltrate on the patient's chest radiograph or the presence of clinical findings suggestive for this diagnosis)	2
Nursing home resident	2
Altered mental status (defined as any difference from the patient's baseline in any of three spheres or in the ir level of	2

CORELATION BETWEEN MEDS SCORE AND 28 DAYS MORTALITY

MEDS SCORE	Mortality (95% CI)
0-4	0,6% (0-3%)
5-7	5% (1-13%)
8-12	19% (11-29%)
13-15	32% (15-54%)
Over 15	40% (12-74%)

OUR EXPERIENCE

- 300 patients presented to ER in 1 yr suspected with sepsis: analyzed 32 cases - 19 males, 13 females ;

- age: between 18 and 92 yrs;

- SIRS criteria: 14 with fever, 25 with RR>20/minute, 22 with leukocytosis, 22 with HR> 90/minute;

- Anamnesis: neurological diseases – 9, malignant diseases -7, heart failure -5, coronaries disease -5, chronic renal diseases -4, diabetes -4, pneumonia -5, COPD/asthma -5, thyroid diseases -2, cardiac valves – 3, other -27 (hypertension, gall bladder diseases, thyroid diseases etc.).

OUR EXPERIENCE

- MEDS score between 3 and 21 points;
- Blood culture and other bacterial cultures in 15 patients - 3 positive;
- Presepsin between 102 – 7121 pg/mL;
- Procalcitonin – negative or >10 ng/mL (semi-quantitative method THERMO SCIENTIFIC BRAHMS < 0,5; ≥0,5-≤2,0; ≥ 2,0-10; >10);
- Patients with: SIRS – 17, sepsis - 4, severe sepsis - 6; septic shock – 5.

STATISTICS

- Pulmonary diseases (COPD, asthma, pneumonia) - 12 (5 female, 7 male);

- Urinary infections – 9 (5 female, 4 male);

- Digestive diseases – 9 (3 female, 6 male) : gangrenous appendicitis + generalized peritonitis -2, acute gangrenous cholescystitis -4, intestinal occlusion -1, acute enterocolitis -1, acute angiocolitis -1;

- Gynecological diseases -1;

- Acute endocarditis -1 (male).

STATISTICS

- Admitted in hospital – total of 26 cases (81,25%): pneumology -2, gynecology -1, urology -2, gastroenterology -3, general surgery -8, internal medicine- 4, oncology-1, neurology -2, cardiology – 2 and dermatology -1;

- Interventions during hospitalization – admission in ICU - 11; mechanical ventilation – 7;

DECEASED

Deceased in hospital 8 cases (25%):

- MEDS: 8-21 points;
- Presepsin: 593-6745 pg/mL;
- Sepsis-3, severe sepsis-2, septic shock-3;
- Low respiratory infections -5, endocarditis -1, diabetic coma ketoacidosis – 1, intestinal occlusion - 1.
- Associated diseases: neurological diseases-4, malignant diseases- 2, ischemic cardiac diseases – 3

Deceased after hospitalization: 2 cases.

CASE PRESENTATION

Patient M.H.: – male, 55 yrs, heavy smoker, abdominal pain - right hypochondrium, SIRS (WBC 7.200, HR>90/ min, RR>20 /min, fever 6 hrs before), presepsin 3858 pg/ml, PCT >10 ng/ml, fibrinogen 7,1 g/L, TBIL 2,1 mg/mL, MEDS 5, abdominal ultrasound nothing special;

- patient was admitted in an Internal Medicine ward because I insisted - great PSEP value associated with SIRS but without leukocytosis;

- After 24 hrs of antibiotic treatment and fever he was transferred to an surgical department for Acute abdomen – surgical intervention appendicectomy (gangrenous acute appendicitis).

- He was discharged after 1 week.

CASE PRESENTATION

Patient D.C.: – male, 57 yrs, abdominal pain - right hypochondrium, septic shock (WBC 11.100, HR>130/ min, RR>30 /min, AP 85/60 with dobutamine perfusion), presepsin 7129 pg/ml, PCT >10 ng/ml, MEDS 5, fibrinogen 7,85 g/L, creatinine 8,1 mg/mL, BUN 131 mg/mL;

- patient with type II diabetes, arterial hypertension, was admitted in surgical department via ICU;

- He has undergone surgery for Acute gangrenous cholecystitis with generalized peritonitis, with associated diseases - acute renal failure and moderate bilateral pleural effusion;

- After 2 weeks in ICU he was transferred in the surgical ward and dicharged after another 1 week.

CONCLUSIONS

- Presepsin – important biomarker used in the rapid diagnosis of sepsis (17 min) in comparison with PCT (30 min);

- Allows to the ER doctor to present the patient situation to his colleagues from the hospital wards;

- Allows patient evaluation and early treatment initiation, even at ER level.

CONCLUSIONS

- In some particular cases a great PSEP value rises in front of the emergency medicine physician a problem – which is the starting point of sepsis?

- PSEP determination gives to the ER physician an advantage when he wants to hospitalize the patient from ER in one of the hospital wards without the consent of the on duty physician.

THANK YOU FOR YOUR ATTENTION!