



Presepsin in Early Laboratory Diagnostics and Monitoring of Sepsis in Pediatric Patients with Oncology Diseases

Golovnya E., Baykova V., Saltanov A., Sotnikov A.

Institute of Pediatric Oncology and Hematology

of Federal State N. N. Blokhin Russian Cancer Research Center, Moscow

**3rd international Presepsin workshop,
Rome, September 17, 2016**

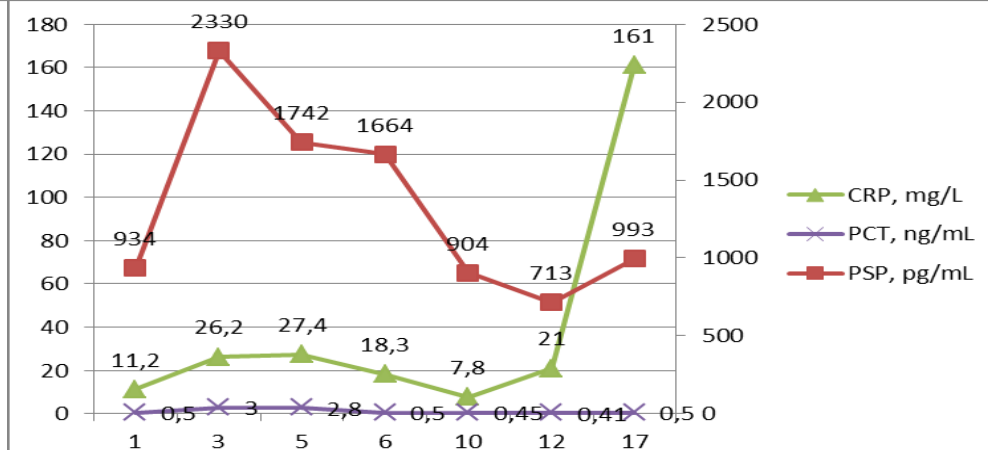
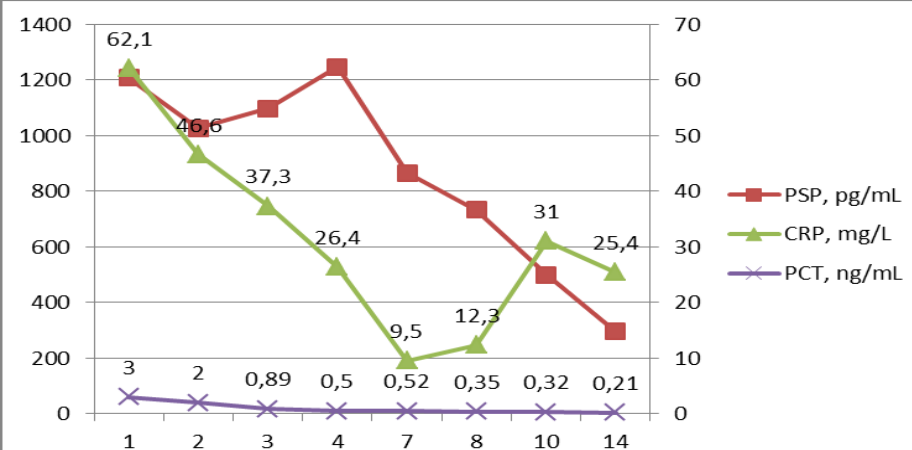
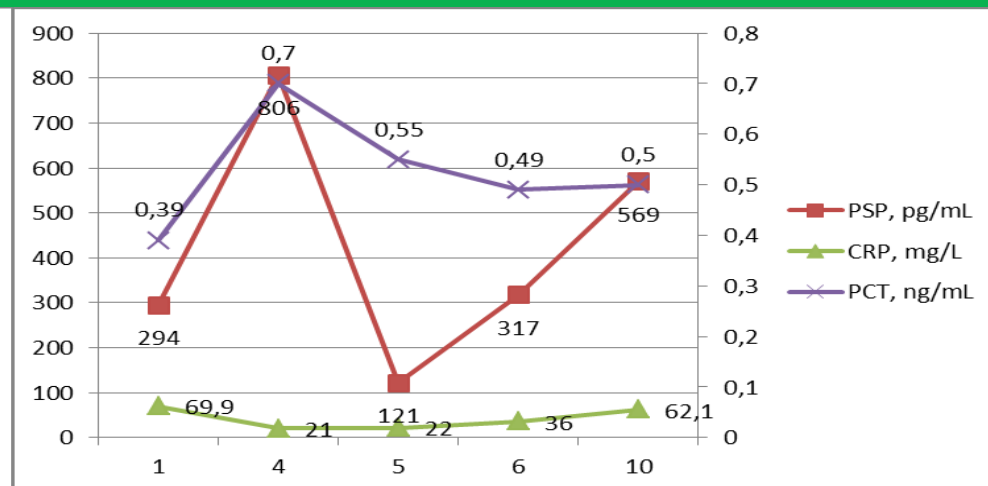
.Aim:

To evaluate diagnostic and prognostic potential of PSEP in pediatric cancer patients with endotoxemia, sepsis and septic shock

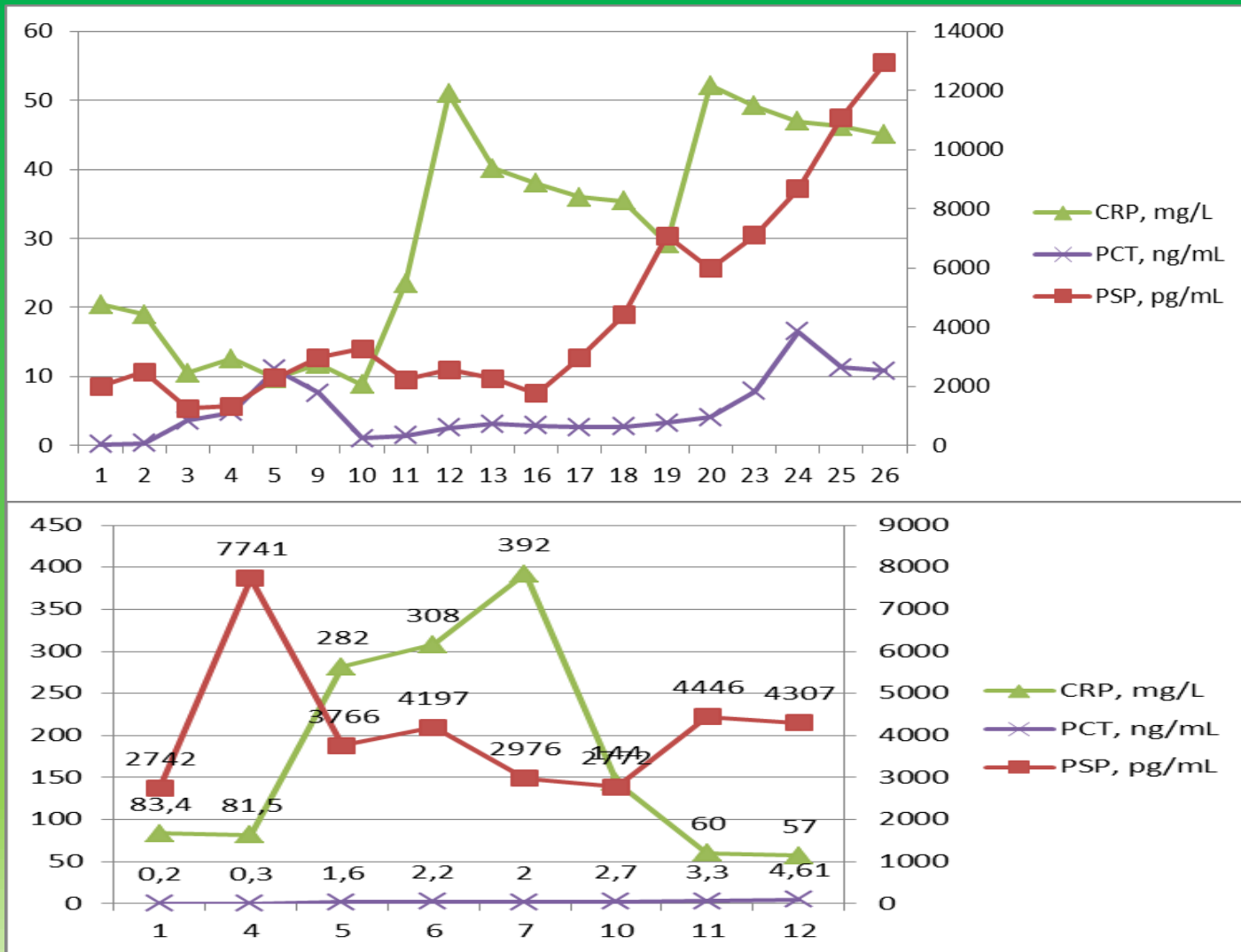
.

- 37 patients
- Age 1 – 17 years
- Different types of cancer
- Positive hemocultures (bacteria, fungi)
- Measurements – PSEP, PCT, CRP, WBC
- Survived - n=30,
- Non survived – n=7

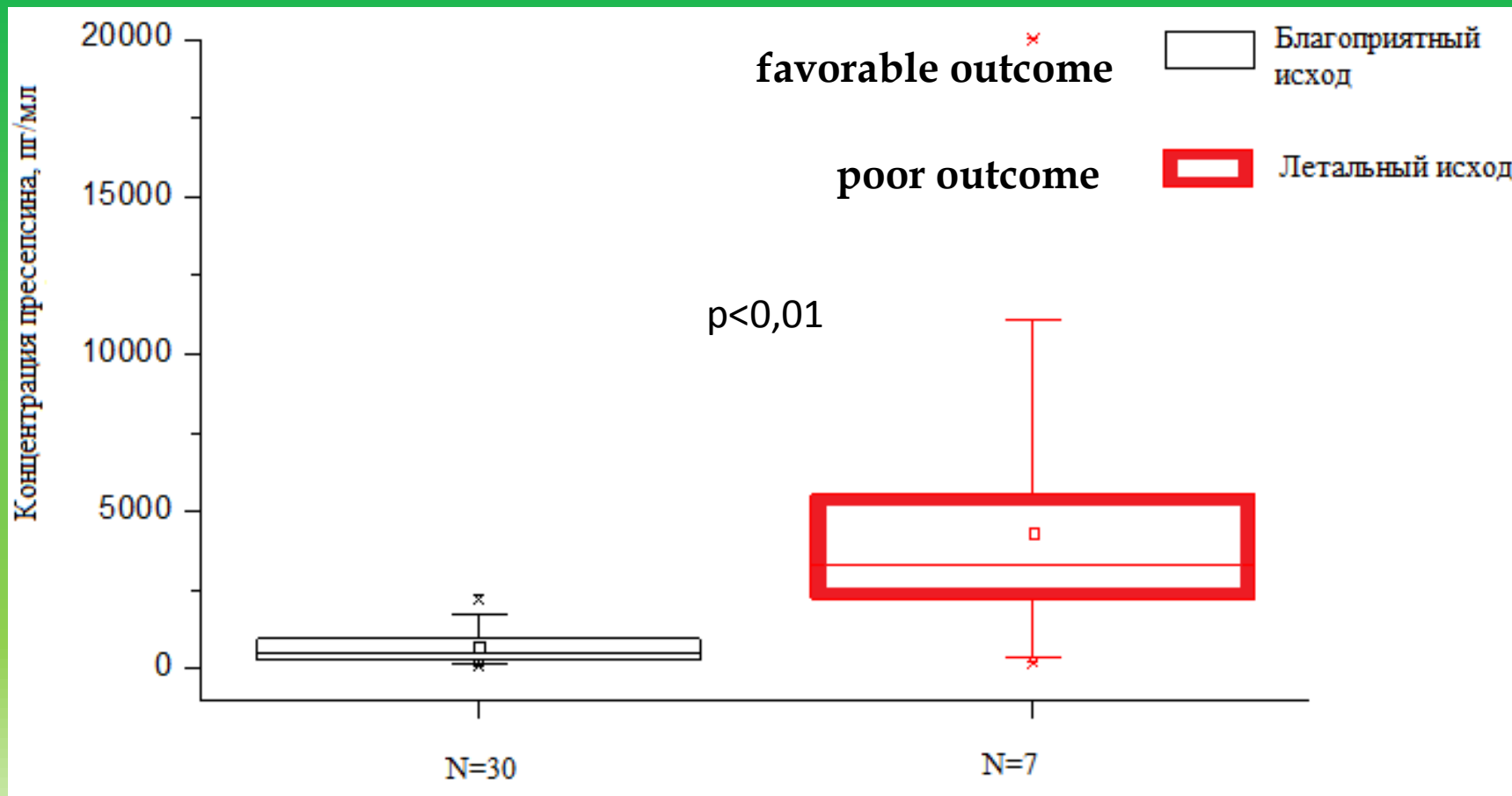
The Dynamics of PSEP, CRP, PCT in survived patients



The Dynamics of PSEP, CRP, PCT in non-survived patients



The Cut-off levels of PSEP for prediction of outcomes

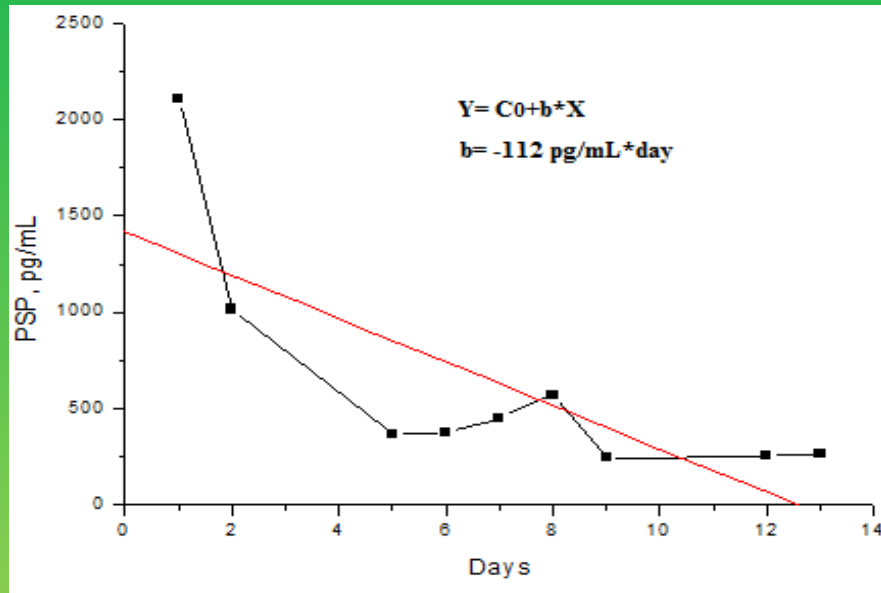


PSEP (mean) 691 pg/ml

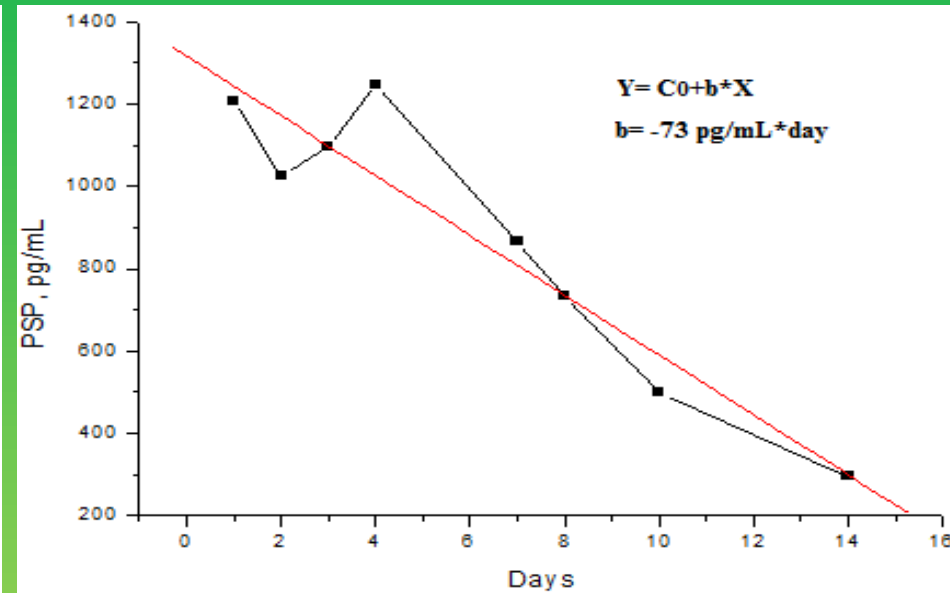
4313 pg/ml

The Dynamics of PSEP in Patients with favorable outcome of sepsis (linear approximation assessment).

b-coefficient (Delta) of PSEP changing - pg/ml/day



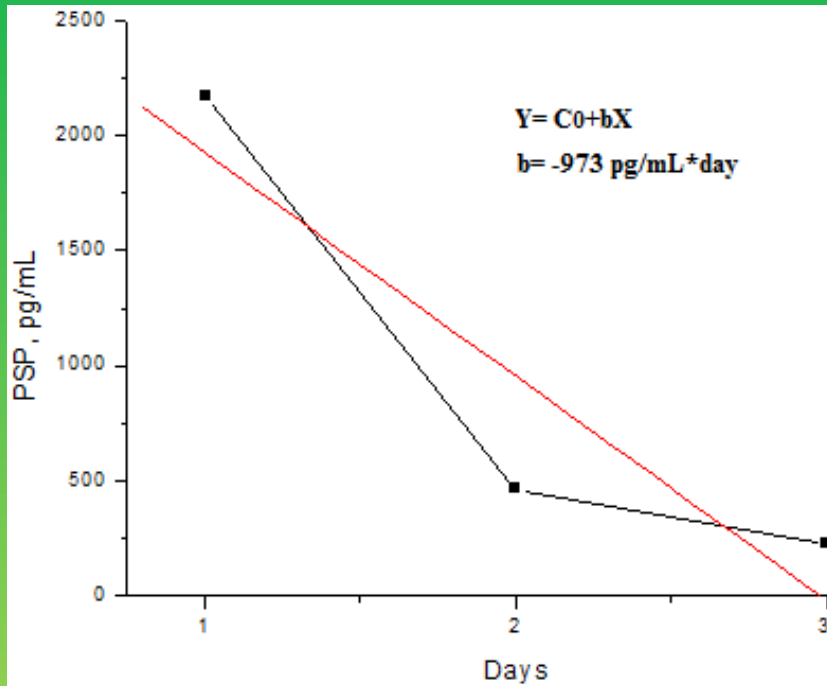
Patient K.
Ds.: Ewing's sarcoma of shin-bone.
Complications: severe sepsis, bilateral pneumonia, multi-organ failure.



Patient S.
Ds.: Ewing's sarcoma of shin-bone.
Complications: infection of endoprosthesis.

The Dynamics of PSEP in Patients with favorable outcome of sepsis (linear approximation assessment).

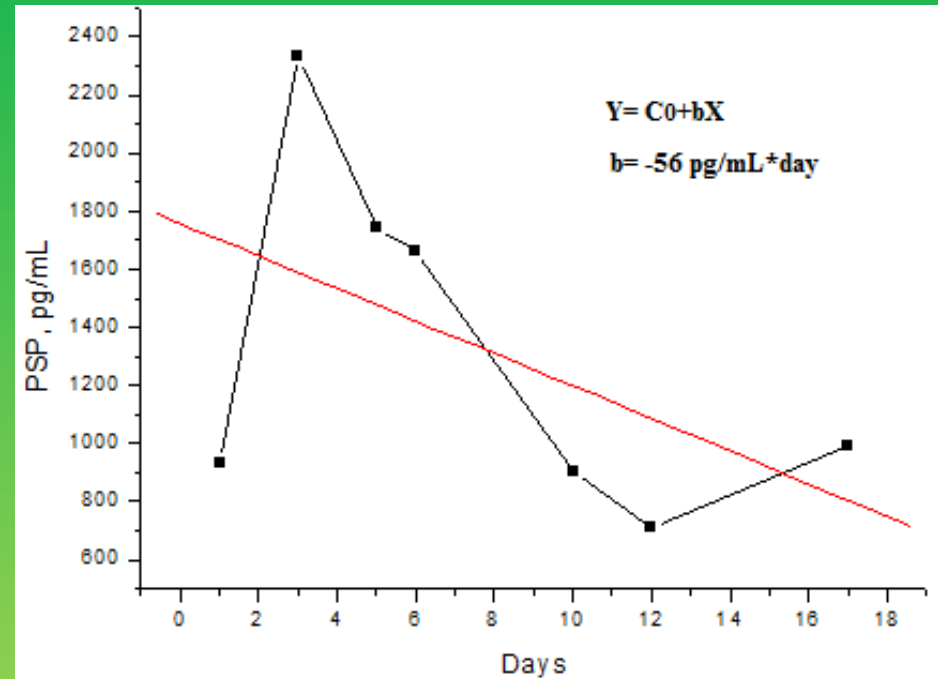
b -coefficient (Delta) of PSEP changing - pg/ml/day



Patient B.

Ds.: Acute lymphoblastic leukemia

Complications: sepsis, septic shock



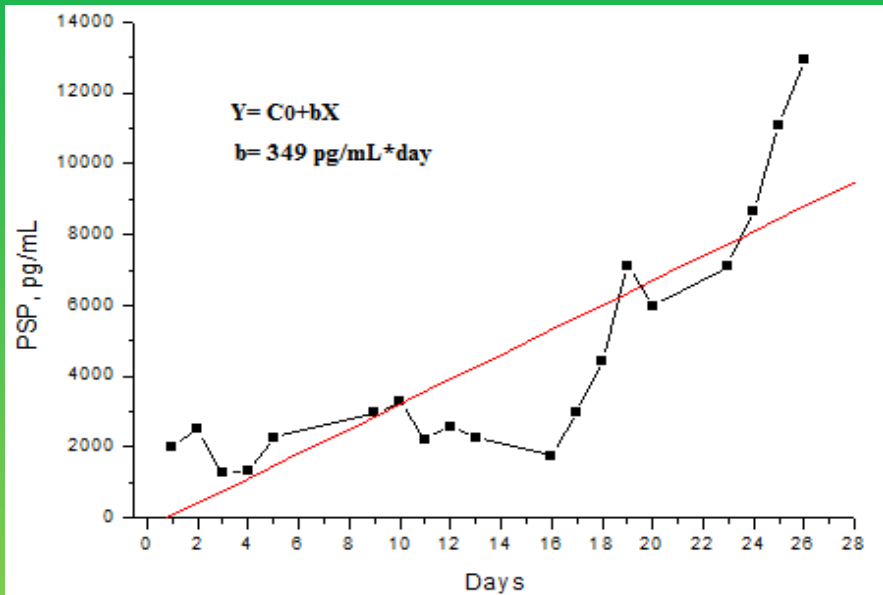
Patient M.

Ds.: Osteosarcoma of left thigh-bone.

Complications: sepsis.

The Dynamics of PSEP in Patients with poor outcome of sepsis (linear approximation assessment).

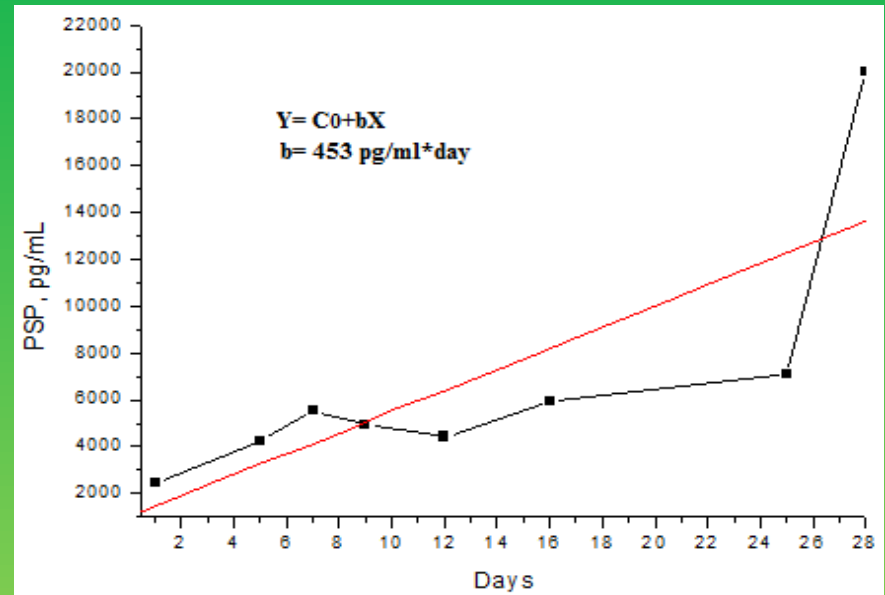
b-coefficient (Delta) of PSEP changing - pg/ml/day



Patient K.

Ds.: Primitive Neuroectodermal Tumor of temporal.

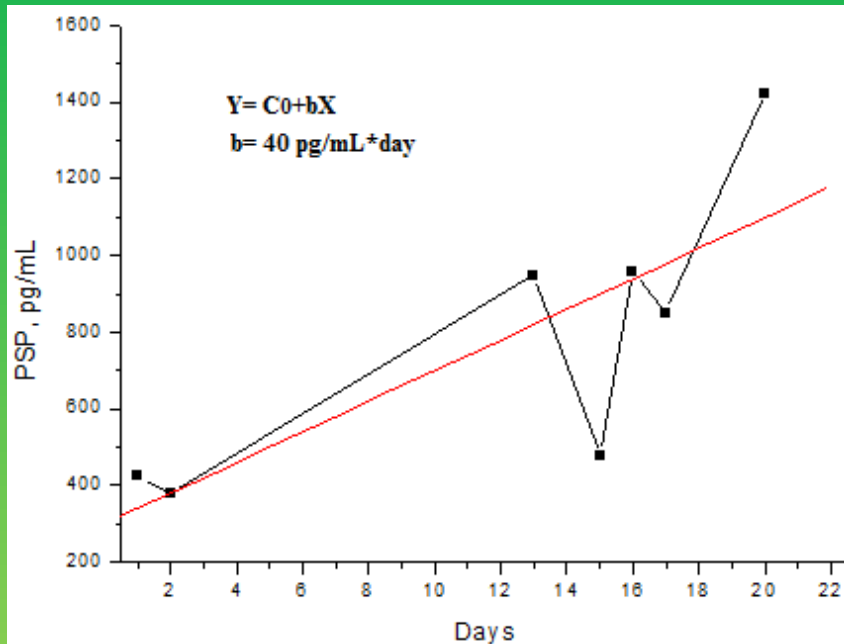
Complications: sepsis, septic shock (*S. haemolyticus*, fungi); acute graft-versus-host disease.



Patient S.

Ds.: medulloblastoma of cerebellopontine angle.
Complications: acute graft-versus-host disease, disseminated intravascular coagulation syndrome, multi-organ failure.

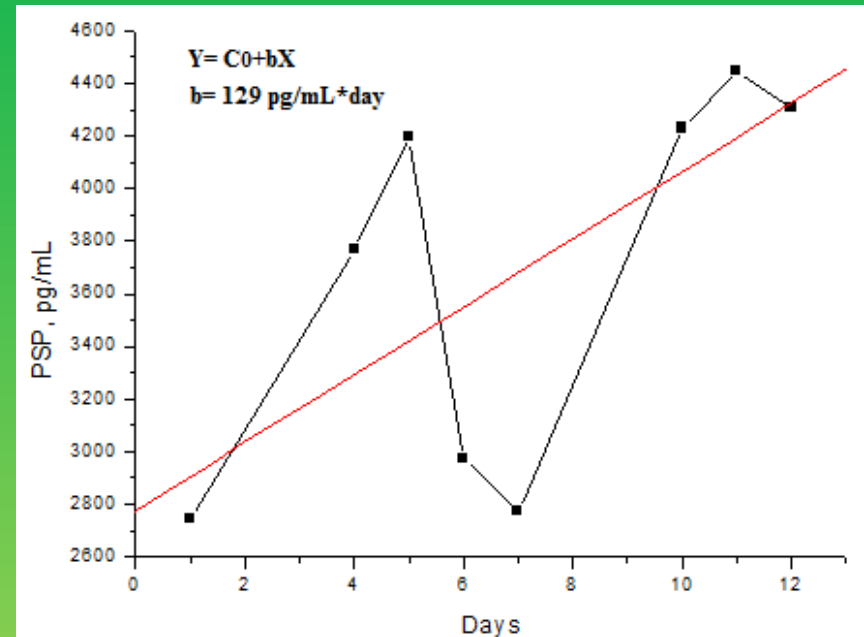
The Dynamics of PSEP in Patients with poor outcome of sepsis (linear approximation assessment). b-coefficient (Delta) of PSEP changing - pg/ml /day



Patient N.

Ds.: medulloblastoma of fourth ventricle

Complications: agranulocytosis,
lung & brain haemorrhage, ARDS.

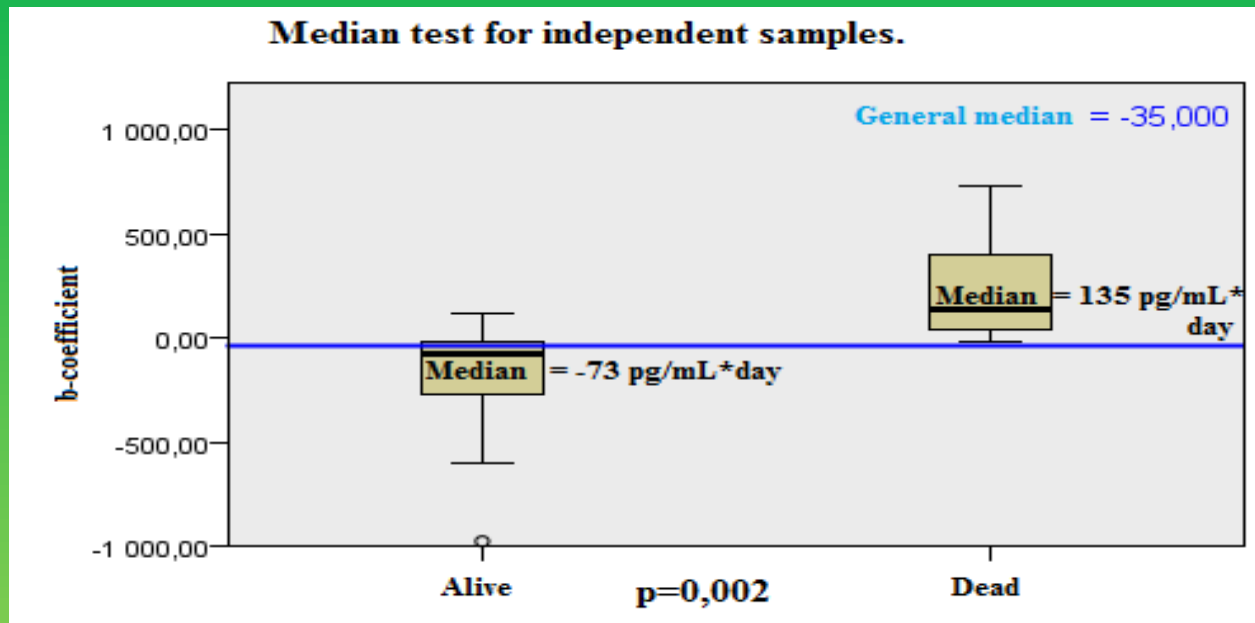


Patient L.

Ds.: Hodgkin disease

Complications: agranulocytosis,
sepsis, septic shock.

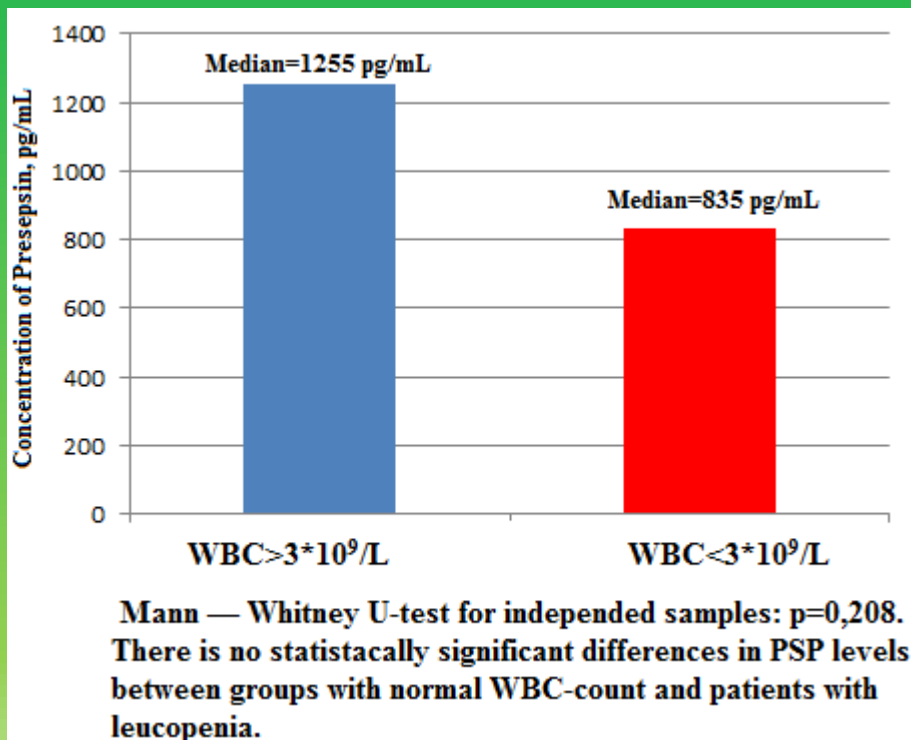
The values of Delta of PSEP changing predict outcomes ($p=0,002$)



Survived; n=22;
Non-survived; n=8.

There was no significant association between outcomes and Delta of PCT ($p=0,08$) & CRP ($p=0,432$) changing.

The Diagnostic and Prognostic Values of PSEP in patients with Normal WBC count and with leucopenia are similar



19 pts with normal
or elevated WBC-count;

24 pts with leucopenia
WBC count

Min - 0,1 x 10⁹ wbc/l;

Max - 7,01 x 10⁹ wbc/l.

PSEP monitoring and Guidance of therapy. Preliminary recommendations.

PSEP measurements every 24 h

Poor prognosis and indication to change a therapy
(antibiotics):

1. If basic PSEP < 1000 pg/ml

and delta > [basic PSEP × 0.4] during 2-3 days,

(improving of clinical characteristics; stopping of mechanical ventilation, lowering vasopressors , improving of hemodynamics etc must be taken into consideration

2. If basic PSEP > 1000 pg/ml

and delta > [basic PSEP × 0.2] during 3 days

Conclusions:

In pediatric patients with different types of cancer:

- PSEP is the most early and sensitive marker of sepsis in comparison with PCT & CRP
- Mean values of PSEP levels in survived and non-survived patients are significantly different and consist 691 pg/ml vs. 4313 pg/mL respectively ($p < 0,01$)
- The values of PSEP are non dependent significantly on WBC count and could be used for diagnostics of infectious complications in pediatric patients with oncology disease and leukopenia.
- Negative or positive values of PSEP Delta (pg/ml/day) are associated with favorable or non-favorable course of sepsis and allow to make approximate prognosis of PSEP dynamics and probable patients outcome.
- Only values of PSEP Delta (pg/ml/day), but not of PCT and CRP are significantly different in survivors and non-survivors ($p = 0,002$).



Thank you for attention