NOSEP and Clinical Scores for Nosocomial Sepsis in a Neonatal Intensive Care Unit

To predict the nosocomial sepsis Mahieu, *et al.* developed a scoring system called NOSEP which had three hematologic variables, one clinical sign and one risk factor; CRP, ≥14 mg/l; neutrophil fraction, >50%; thrombocytopenia, <150.000/mm^3; fever, >38.2°C; exposure to parenteral nutrition solutions for ≥14 days [1, 2]. In the present study, we compared the accuracy of NOSEP scoring system with a clinical scoring system defined by our NICU and tried to determine the most defining signs, symptoms and laboratory data for nosocomial sepsis. In our unit the incubators are sterilised weekly by special solutions suggested by the manufacturer, disposable ventilator circuits are used and changed weekly. Sick preterm infants are fed by breast milk once they come off total parenteral nutrition which is prepared in a special unit under sterile conditions. All the records of the neonates diagnosed as suspected nosocomial sepsis between January 1, 1999 and September 1, 2003 in our NICU were investigated retrospectively. We included 51 patients who had positive blood culture and 51 patients with R/O sepsis who had same gestational age with septic neonates. All the patients in each group were evaluated for sepsis both by the NOSEP score and clinical scoring system developed by our unit. The variables of NOSEP scoring system and of our clinical scoring system and the points given to each parameter are shown in Table 1. NOSEP score between 8–24 or, clinical score between 6–12 were considered significant for possible infection. Statistical analysis for all risk factors including clinical and laboratory variables was performed with SPSS software (SPSS 11.0, SPSS Inc, Chicago, and IL, USA) using Mann–Whitney U test, Wilcoxon rank sum test and Student *t* test. Logistic regression model was also used for the variables of NOSEP and clinical scores independently and in combination in a stepwise approach to determine the parameters mostly suggestive of neonatal nosocomial sepsis.

During the five-year period, 51 episodes of proven NS, as defined earlier, were identified in a total 132 suspected sepsis episodes. The clinical and laboratory data during signs of infection were compared between neonates with sepsis and R/O sepsis (Table 2). Duration of hospitalization, duration of ventilation, trombocyte count, CRP value, highest blood glucose concentration, minimum calcemia, neutrophil fraction, I:T ratio, NOSEP score and clinical score were significantly different in neonates with sepsis, as well as need for extra oxygen, bradycardia, recent surgery and feeding intolerance. However, the sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV) of NOSEP scoring system were 64, 58, 45 and 75% respectively. The sensitivity, specificity, PPV, NPV of the clinical scoring system were 56, 71, 86, 33% respectively. The clinical and laboratory parameters which were found to be significantly different between newborns with R/O sepsis and proven sepsis were analyzed by logistic regression model and feeding intolerance, higher I:T ratio variables were found to be the only significant predictors of nosocomial sepsis.

In conclusion, currently there seems to be no reliable tool for early diagnosis of sepsis in neonates and clinical observation and decision making on an individual basis seems the only way to go as opposed to adding up scores at bedside.

Nazan Dalgic[a], Ebru Ergenekon[b], Esin Koc[b] *and* Yildiz Atalay[b]
[a]Department of Pediatrics and [b]Division of Newborn Medicine, Faculty of Medicine, Gazi University, Ankara, Turkey

Table 1
The variables of NOSEP scoring system and clinical scoring system

NOSEP scoring system	Score	Clinical scoring system	Score
CRP (>10 mg/l)	5	Respiratory symptom	2
Neutrophils (>50%)	3	Abdominal distension	2
Thrombocytopenia (<150 000/l)	5	Feeding intolerance	2
TPN Duration (≥14 days)	6	Hypotension	2
Fever (>38.2°C)	5	Bradycardia	2
		Lowest and highest body temperature difference	2

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TABLE 2
Comparison of neonates with sepsis and with R/O sepsis

Variables	Neonates with sepsis ($n=$)	Means (±SD)	Neonates with R/O sepsis ($n=$)	Means (±SD)	p
Gestation age***	51	35.29 ± 4.9	51	35.82 ± 4.71	0.579
Birth weight***	51	2421 ± 987.04	51	2608.7 ± 973.8	0.339
Hospitalizasyon days***	51	30.61 ± 29.67	51	15.49 ± 13.11	0.001*
Ventilation days**	18	10.05 ± 7.66	9	3.88 ± 2.75	0.029*
Corticosteroid days**	6	2.5 ± 1.76	3	1.66 ± 0.57	0.463
TPN days**	16	15.68 ± 9.58	16	12.81 ± 8.78	0.384
CVC days**	9	10.88 ± 4.93	9	10.55 ± 5.02	0.889
Leukocyte count***	51	$12\,658.24 \pm 4793.35$	51	$12\,847.64 \pm 5772.74$	0.857
Thrombocyte count***	51	$187\,316.1 \pm 126\,369.78$	51	$264\,568 \pm 136\,885.83$	0.004*
CRP*** (mg/dl)	38	59.34 ± 35.80	30	30.85 ± 30.78	0.001*
Lowest blood glucose*** (mg/dl)	51	49.59 ± 21.04	39	56.28 ± 24.14	0.164
Highest blood glucose*** (mg/dl)	51	139.33 ± 68.19	40	113.15 ± 49.74	0.044*
Minimum calcemia*** (mg/dl)	49	7.42 ± 1.08	41	8.45 ± 1.21	0.0001*
Maximum calcemia*** (mg/dl)	49	9.66 ± 1.11	31	9.8 ± 0.85	0.504
Neutrophil fraction >50%***	51	62.43 ± 18.37	51	54.65 ± 20.09	0.044*
Fever >38°C***	51	37.05 ± 5.32	51	37.72 ± 0.51	0.375
I:T ratio***	45	0.21 ± 0.17	51	0.056 ± 0.09	0.001*
Difference of lowest and highest body temperature***	50	1.81 ± 0.69	51	1.60 ± 0.6	0.099
NOSEP score***	51	10.63 ± 5.34	51	6.82 ± 4.52	0.0001*
Clinical score***	51	5.84 ± 3.71	51	3.49 ± 2.74	0.0001*

TPN, total parenteral nutrition; CVC, central vascular catheter.
*$p<0.05$, **Mann–Whitney U test and Wilcoxon rank sum test, ***Student's t test.

References

1. Mahieu LM, De Muynck AO, De Dooy JJ, *et al.* Prediction of nosocomial sepsis in neonates by means of a computer-weighted bedside scoring system (NOSEP score). Crit Care Med 2000;28:2026–33.

2. Mahieu LM, De Dooy JJ, Cossey VR, *et al.* Internal and external validation of the NOSEP prediction score for nosocomial sepsis in neonates. Crit Care Med 2002;30:1459–66.

Correspondence: E-mail <nazandalgic@ttnet.net.tr>.

Serum Level of Antioxidant Taurine in β-Thalassaemia Subjects: Possible Protection Against Thalassaemia Complications

The thalassaemias are hereditary anaemias that occur because of mutations in the globin genes that affect the rate of haemoglobin synthesis [1]. Oxidative stress, which has been a topic of considerable investigation, is implicated in a growing list of diseases to include the thalassaemia [2]. The antioxidant taurine has been considered among the very useful antioxidants that showed striking effects both therapeutically and protectively in different diseases [3,4]. Taurine was not considered in thalassaemias, and no data was found in the literature about the determination or use of taurine in thalassaemias. Therefore, from the present work we aimed at the evaluation of the serum level of taurine in β-thalassaemia subjects, and also evaluating the effect of oral taurine on lipid profile, liver functions, and coagulation time in β-thalassaemia carriers.

Serum taurine was measured by HPLC in 14 β-thalassaemia majors, 22 β-thalassaemia carriers, and 17 normal subjects. In addition, oral taurine (1000 mg/day) was supplemented to the carriers for 8 weeks.

Results indicated that both patients and carriers for β-thalassaemia have significantly low serum taurine levels compared to normal subjects ($p<0.05$), The reduction of serum taurine was more pronounced in patients than in carriers compared to normal controls the values of which were: 43.23 ± 2.45, 49.86 ± 3.76, 56.55 ± 4.60 μmol/l respectively.

Although taurine supplementation (1000 mg/day) for 8 weeks did not result in any significant changes in the lipid profile of β-thalassaemia carriers, however, it resulted in a significant amelioration in the activity of liver enzymes (AST & ALT) which showed an upper-limit baseline values, the effect of taurine supplementation on ALT was more pronounced than the effect on AST. Moreover, the results regarding the coagulation time in

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