Value of urine sTREM-1 and urine CRP as laboratory parameters for neonates with late onset neonatal sepsis: A prospective trial

Senem Alkan Ozdemir *, Ruya Colak*, Ezgi Yangin Ergon, Meral Yildiz, Ferit Kulali, Tulin Yildirim, Sebnem Calkavur

*** Behcet Uz Children's Hospital, Izmir ,Turkey**

Introduction

Sepsis is a complex clinical condition caused by a dysregulated immune response to an infection resulting in a fatal outcome.This study aimed to investigate the value of urine soluble triggering receptor expressed on myeloid cells (sTREM-1) and urine CRP with repetitive measurements for diagnosing culture-proven sepsis in infants with late onset sepsis (LOS).

Materials and Methods

This prospective, observational study was conducted in a level III neonatal intensive care unit at Behcet Uz Children's Hospital,between 2016-2017.The postnatal ages of included neonates were older than 72 hours with clinical and laboratory signs of sepsis. According to the results of blood cultures,the studied neonates were classified into two groups:culture positive sepsis and culture negative sepsis.The initial laboratory investigations included the white blood cell (WBC) count,platelets (PLT),CRP levels,blood urea nitrogen (BUN) levels,and creatinine (SCr) levels. Urine sTREM-1,urine CRP samples and blood cultures were synchronously collected.Urine samples were recollected at the end of the treatment.

Results

A total of 66 infants were included in the study;33 had culture positive sepsis and 33 were culture negative sepsis. There were no significant differences in gestational age,sex,birth weight,and delivery mode between the groups.Neonates in the culture-positive group had significantly higher urine sTREM-1 and urine CRP levels than did those in the suspected sepsis group.Using a cut-off point for a urine sTREM-1 level of 129 pg/mL,the sensitivity was 0.63, specificity was 0.85,positive predictive value was 0.80,and negative predictive value was 0.70. Urine STREM-1 and urine CRP levels had dropped at the end of the treatment.

Conclusion

We think that the urine sTREM-1 and urine CRP, which are an easy, inexpensive and rapid method with serum CRP in the neonatal period for diagnosis of sepsis, will be more effective in detecting culture proven sepsis and in decreasing unnecessary antibiotherapy.

References

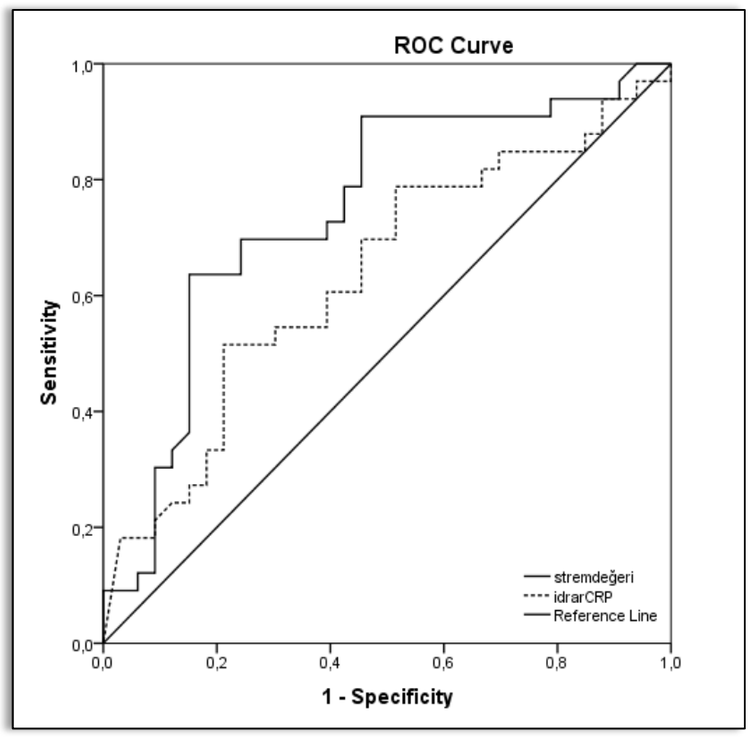
1. Sarafidis K, Soubasi-Griva V, Piretzi K, et al. Diagnostic utility of elevated serum soluble triggering receptor expressed on myeloid cells (sTREM)-1 in infected neonates. Intensive Care Med 2010; 36: 864–868.
2. Alkan Ozdemir S, Arun Ozer E, Ilhan O, Sutcuoglu S,,Tatli M. Diagnostic value of urine soluble triggering receptor expressed on myeloid cells (sTREM-1) for late-onset eonatal sepsis in infected preterm neonates. J Int Med Res 2018 Apr;46(4):1606-1616

Table 1. General characteristics of the infants

	Culture-positive sepsis (n=33)	Culture-negative sepsis (n=33)	p
Gestational week (week)*	31.9±5.0	34.1±4.6	0.07
Birth weight (g)*	1771±1069	2190±1015	0.10
Male gender (%)	22 (66)	22 (66)	1.0
C/S delivery (%)	28 (84)	23 (69)	0,11
Weight at diagnosis (gram)*	1938±1046	2580±933	*0.01*
Maternal age *	29.7±7.0	27.4±5.3	0.14
Postnatal age (day)*	22.9±13.4	21.3±16.4	0.66

Table 2. Laboratory findings of the infants

	Culture-positive sepsis (n=33)	Culture-negative sepsis (n=33)	p
WBC ($x10^9$/L)*	11912±7000	11381±4475	0.71
PLT ($x10^9$/L)*	252.4±168	393.6±174	*0,001*
BUN (mmol/L)*	12.5±10.4	11.6±8.4	0.68
Creatinin (mol/L*)	0.52±0.12	0.53±0.22	0.73
CRP (mg/dL)*	3.09±2.7	2.2±2.5	0.18
sTREM-1 (pg/ml)**	140 (35/263)	70 (32/242)	*<0.001*
Urine CRP (ng/mL)**	10.11 (0.05/40)	2.32 (0.07-40)	*0.05*



	Cut off	sensitivity	Spesitivity	PPV	NPV	LR	-LR	AUC±SE	p
sTREM-1 (pg/mL)	129	63.64	84.85	80.8	70	4.20	0.43	0.746±0.06	*<0.001*
CRP (ng/mL)	9.4	51.52	78.79	70.8	61.9	2.43	0.62	0.637±0.06	*0.049*