SERUM KALLISTATIN LEVEL AS A PROGNOSTIC MARKER IN SEPTIC SHOCK PATIENTS

Tayseer Mohamed Zaytoun, Ehab Mahmoud El-Reweny, Mahmoud Emadeldin Abodorra, Riham Rifai Ibrahim Rifai
Department of Critical Care Medicine, Faculty of Medicine, University of Alexandria

Introduction

Sepsis and septic shock are major causes of ICU mortality, as 11-15% of admitted patients suffer from or will develop severe sepsis and septic shock, with mortality rates varying between 30-60%.
The main treatment of sepsis and septic shock remain supportive despite major advances in diagnosis and early treatment.
Kallistatin is protein that has multiple functions; anti-inflammatory, anti-angiogenesis, anti-apoptosis, and anti-oxidation. It is thought to have a protective role in the pathogenesis of sepsis and septic shock; hence its levels potentially decrease with increasing severity of the disease.
Our study aimed to assess kallistatin as prognostic biomarker to predict 28-day mortality in addition to predicting different morbidity parameters (ICU stay, duration of MV, duration of VP, relation to AKI and relation to RRT) in septic shock patients, comparing this single biomarker to other markers that are currently being used (qSOFA, APACHE II, CRP and PCT).

Aim of the Work

The aim of this study was to assess the role of serum kallistatin level as an early prognostic marker for morbidity and mortality in SS patients.

Subjects and Methods

The study was conducted on 95 septic shock patients admitted to Critical Care Medicine Department in Alexandria main university hospital. The analyzed patients were classified into two groups: Group I (Survivors)and Group II (Non-survivors).
Full history taking and a thorough clinical examination was done regarding all the patients, qSOFA and APACHE II scores were calculated, routine laboratory investigations were done, CRP, PCT and kallistatin levels were measured and compared on admission and on day3. Patients were then followed up for 28 days to assess the ability of the markers to predict morbidity and mortality of the disease.

Results

Table 1: Prognostic performance for different markers at day 1 and day 3 to predict mortality

	AUC (SE)	95% CI	Sig.	Cutoff value	Sn	SP	+PV	-PV
APACHE II	0.855	0.722 to 0.938	<.001*	>21	89.06	51.61	79.2	69.6
CRP Day 1	0.702 (0.060)	0.599 to 0.791	<.001*	>90.2	79.69	70.97	85.0	62.9
Day 3	0.803 (0.055)	0.709 to 0.878	<.001*	>85.4	85.94	77.42	88.7	72.7
Change	0.649 (.058)	0.544 to 0.744	.008*	>-25	92.19	22.58	71.1	58.3
PCT Day 1	0.746 (0.058)	0.647 to 0.830	<.001*	>2.7	98.44	32.26	75.0	90.9
D3	0.901 (0.0407)	0.822 to 0.953	<.001*	>4	93.65	83.87	92.2	86.7
Change	0.628 (0.064)	0.522 to 0.726	0.045*	>-14	96.83	19.35	70.9	75.0
Kallistatin Day 1	0.561 (0.0661)	0.456 to 0.663	0.354	NA	NA	NA	NA	NA
Day 3	0.659 (0.0589)	0.555 to 0.753	0.006*	≤2.83	75.00	67.74	82.8	56.8
Change	0.636 (0.654)	0.531 to 0.733	0.039*	≤-0.02	78.12	54.84	78.1	54.8

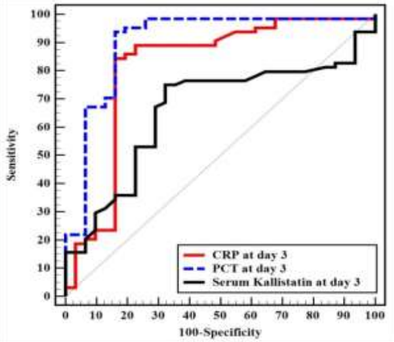

Figure 1: ROC curve for different markers to predict mortality at Day 3

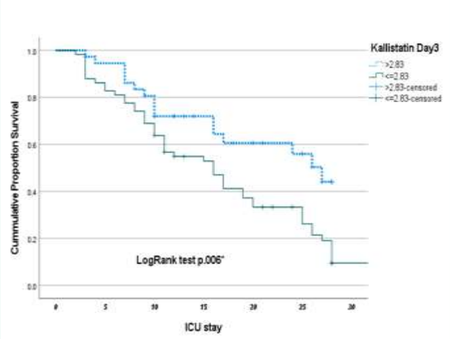

Figure 2: Kaplan-Meier curves of 28-day survival with patients grouped according to day 3 kallistatin levels >2.83 µg/ml or≤ 2.83

Table 2: Association between different parameters and mortality outcome

		Mortality						Sig.
		Total		Group I		Group II		
		Frequency	%	Frequency	%	Frequency	%	
CRP D1 (mg/L)	≤90.2	35	36.8%	22	71.0%	13	20.3%	<.001*
	>90.2	60	63.2%	9	29.0%	51	79.7%	
CRP D3 (mg/L)	≤85.4	33	34.7%	24	77.4%	9	14.1%	<.001*
	>85.4	62	65.3%	7	22.6%	55	85.9%	
PCT D1 (ng/mL)	≤2.7	11	11.6%	10	32.3%	1	1.6%	<.001*
	>2.7	84	88.4%	21	67.7%	63	98.4%	
PCT D3 (ng/mL)	≤4	31	32.6%	26	83.9%	5	7.8%	<.001*
	>4	64	67.4%	5	16.1%	59	92.2%	
Kallistatin D3 (ng/mL)	>2.83	37	38.9%	21	67.7%	16	25.0%	<.001*
	≤2.83	58	61.1%	10	32.3%	48	75.0%	

Conclusion

·Kallistatin at day 1 cannot be used to determine 28-day mortality as a result of septic shock, but Kallistatin at day 3 and its variation from day 1 to day 3 have a significant prognostic value of mortality in septic shock.
·No statistical significance could be found between kallistatin and different morbidity parameters (ICU days, duration of MV, duration of VP, AKI and RRT).