

POSTER PRESENTATION

Open Access

Diagnostic and prognostic usefulness of mid-regional pro-adrenomedullin levels in patients with severe sepsis

F Valenzuela Sanchez^{1*}, B Valenzuela Mendez², R Bohollo de Austria¹, JF Rodríguez Gutierrez³, M Jaen Franco¹, MA González García⁴, A Jareño Chaumel¹

From ESICM LIVES 2015

Berlin, Germany. 3-7 October 2015

Introduction

Mid-regional pro-adrenomedullin (MR-proADM) is a fragment of 48 amino acids which splits from the final proADM molecule in a ratio of 1:1 with ADM. It is essentially irrelevant, but proportionally represents the levels and activity of ADM. Its half-life is several hours longer, and its plasma concentrations can be determined in clinical practice. It has been identified as a prognostic marker, stratifying the mortality risk in patients with sepsis.

Objectives

To evaluate the usefulness of MR-proadrenomedullin (MR-proADM) levels in the diagnosis and prognosis of sepsis in patients admitted to the ICU.

Methods

Prospective observational single-center study. A total of 120 consecutive patients with suspected severe sepsis were recruited to the ICU of Jerez Hospital. Epidemiological, clinical, laboratory data and MR-proADM, Procalcitonin (PCT), and C-reactive protein (CRP) levels were collected at the time of admission, at 48 hours, at the 5th day and on the day of discharge from the ICU.

Results

104 patients were diagnosed at discharge of severe sepsis and 16 patients were diagnosed of SIRS without sepsis. The group of septic patients reached MR-proADM levels of 4.05 nmol/l vs of 0.309 nmol/l in not septic patients ($p < 0.0001$). The AUC-ROC was 0.9474 (Figure 1).

At 48 hours after admission the MR-proADM levels in surviving septic patients fell to 1.65 nmol/l and in the non-survivors 2.475 nmol/l ($p = 0.04$). On the 5th day following admission the survivor levels fell to 1.36 nmol/l vs 3.42 nmol/l in the septic patients who died in the ICU ($p = 0.0006$). At the 5th day the survivors showed greater clearance MR-proADM with a median level of 62.7% vs 21.2% in the non-survivors (Table 1).

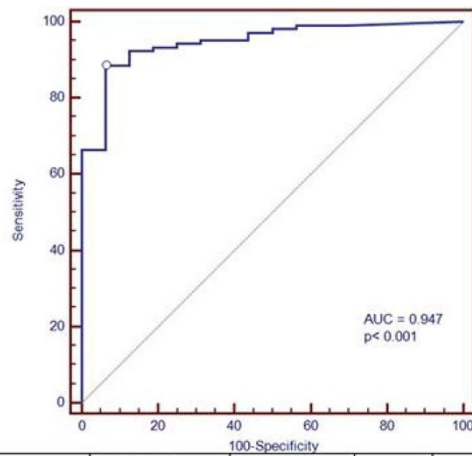
The AUC the ROC curve at the 5th day was: MR-proADM 0,828 ($p = 0,001$); PCT 0.725 ($p = 0,016$) CRP 0.700 ($p = 0,0214$). The AUC the ROC curve to MR-proADM clearance at the 5th day was 0,734 ($p = 0,0104$) (Figure 2)

Patients with MR-proADM levels of 2.5 nmol/l and above or MR-proADM clearance less than 30% at the 5th day following admission in the ICU showed an enhance in mortality ($p < 0.0001$). In the multivariate analysis (Cox proportional hazards models) MR-proADM levels and MR-proADM clearance at the 5th day following admission, were statistically significant predictive factors for mortality in the ICU and at 90 days (Figure 3).

Conclusions

Initial MR-proADM levels help to identify the infectious origin in patients with SIRS and organ dysfunction. MR-proADM levels and its clearance at the 5th day following admission are the most effective biomarker to determine unfavorable evolution and the risk of mortality in patients with severe sepsis admitted to the ICU.

¹Hospital del SAS de Jerez, Critical Care Medicine, Jerez de la Frontera, Spain
Full list of author information is available at the end of the article



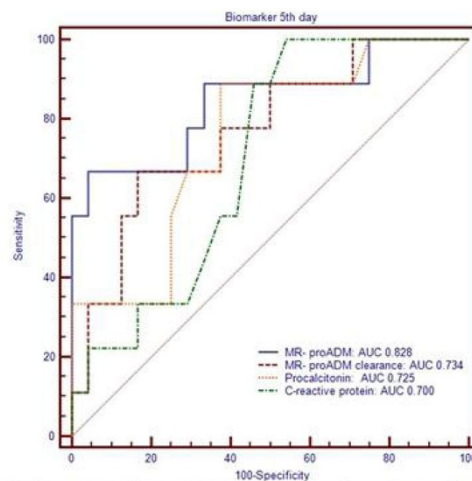
Optimal cut-off values	Sensitivity (95%CI)	Specificity (95%CI)	PPV	NPV	LR+	LR-
≥1.4256 nmol/l	80% (70.8-87)	93.75% (62.50-100)	99%	41.7%	12.77	0.22

Analysis of the receiver operating characteristic curve for MR-proADM levels in order to predict the existence of sepsis at time of admission in the ICU.

Figure 1 ROC curve MR proADM sepsis diagnosis.

Table 1 MR-ADM levels and clearance in survival subgroups

MR-proADM	SEPTIC SURVIVORS		SEPTIC NON SURVIVORS		p
	median	IQR	median	IQR	
ADMISSION levels (nmol/l)	3.04	1.67-6.8	5.7	1.81-7.79	p = 0.263
48 HOURS levels (nmol/l)	1.65	1.11-3.62	2.47	1.43-6.48	p = 0.04
5TH DAY levels (nmol/l)	1.36	0.88-1.96	3.42	2.18-10.57	p = 0.0006
DISCHARGE levels (nmol/l)	1.268	0.88-1.78			
48 HOURS Clearance (%)	43.2	14.4-60.5	22.8	-1.3-59.72	p = 0.20
5TH DAY Clearance (%)	62.7	46.17-82.3	21.2	-38.7-61	p = 0.015



	Optimal cutoff values	Sensitivity (95%CI)	Specificity (95%CI)	PPV (95%CI)	NPV (95%CI)	LR+ (95%CI)	LR- (95%CI)
MR-proADM 5 th DAY	>2.529	77% 46.2-95.0	97% 84.7-99.9	91% 58.7-99.8	92% 77.3-98.3	26.15 3.7-184.5	0.24 0.09-0.6

Analysis of receiver operating characteristic curves, at the 5th day following admission in the Intensive Care Unit for septic patients in order to predict mortality

Figure 2 ROC curves Biomarker 5th day prognosis.

	Endpoint: 90-DAY MORTALITY				
	Variable	Hazard Ratio (95%CI)	Regression Coefficient	Standard error	p value
AT ADMISSION	Apache II	1.1231 1.077-1.170	0.1161	0.02119	<0.0001
AT 48 HOURS	Apache II	1.0983 1.039-1.160	0.09379	0.02812	0.0009
	MR-proADM 48 hours	1.0756 1.008-1.147	0.7290	0.03331	0.0286
AT 5 th DAY	Age	1.0557 1.056-1.108	0.05425	0.02495	0.0297
	Immunodeficiency	4.2387 1.257-14.29	1.4443	0.6233	0.0205
	MR-proADM 5 th day	1.2199 1.102-1.350	0.1988	0.05204	0.0001
	MR-proADM clearance 5 th day	0.9959 0.993-0.998	-0.004091	0.004091	0.0046

Figure 3 multivariate analysis mortality 90 days.

Authors' details

¹Hospital del SAS de Jerez, Critical Care Medicine, Jerez de la Frontera, Spain.

²Hospital Universitari Germans Trias i Pujol, Obstetric and Gynecology Department, Barcelona, Spain. ³Hospital del SAS de Jerez, Hematology, Jerez de la Frontera, Spain. ⁴Hospital del SAS de Jerez, Clinical Analysis Laboratory, Jerez de la Frontera, Spain.

Published: 1 October 2015

doi:10.1186/2197-425X-3-S1-A306

Cite this article as: Valenzuela Sanchez *et al.*: Diagnostic and prognostic usefulness of mid-regional pro-adrenomedullin levels in patients with severe sepsis. *Intensive Care Medicine Experimental* 2015 **3**(Suppl 1):A306.

Submit your manuscript to a SpringerOpen[®] journal and benefit from:

- ▶ Convenient online submission
- ▶ Rigorous peer review
- ▶ Immediate publication on acceptance
- ▶ Open access: articles freely available online
- ▶ High visibility within the field
- ▶ Retaining the copyright to your article

Submit your next manuscript at ▶ springeropen.com