

Appendix 1: Electronic material

Table 1-e: Characteristics of 633 patients included according to the presence or not of acute kidney dysfunction (AKI). (APACHE: Acute Physiology And Chronic Health Evaluation; SOFA: Sequential Organ Failure Assessment, PCT: procalcitonin; ICU: Intensive Care Unit; IQR: interquartile range)

Variable	Non-AKI (n=571)	AKI (n=62)	p-value
Age (in years) , median (IQR)	48 (38-59)	58 (51.67.5)*	<0.001
Male gender , n (%)	316 (55.3)	38 (61.3)	0.37
APACHE II , median (IQR)	13 (9-18)	21 (16-27.2*)	<0.001
SOFA , median (IQR)	5 (3-7)	8 (6-11)*	<0.001
Chronic Obstructive Pulmonary Disease, n (%)	100 (17.5)	15 (24.6)	0.17
Chronic heart disease, n (%)	44 (7.7)	9 (14.8)	0.06
Immunosuppression, n(%)	52 (9.1)	13 (21.0)*	0.003
Shock upon ICU admission, n(%)	264 (46.2)	45 (72.6)*	<0.001
Need of mechanical ventilation upon ICU admission, n (%)	444 (77.8)	52 (83.9)	0.28
Serum Creatinine at ICU admission (mg/dL), median (IQR)	0.8 (0.6-1.0)	1.8 (1.6-2.1)*	<0.001
PCT upon ICU admission (ng/mL) median (IQR)	0.40 (0.13-1.20)	2.62 (0.6-10.0)*	0.002
Serum Urea upon ICU admission (mg/dL), median (95 CI)	33 (23-45)	81.5 (56-108.25)*	<0.001
White blood cells (10 ⁹ /L) , median (IQR)	6.90 (4.3-10.6)	9.09 (5.7-15.3)*	0.008
ICU Length of stay ¹ , median (IQR)	9 (4-18.2)	8 (4-17)	0.53
ICU mortality, n (%)	93 (16.3)	14 (22.6)	0.20

* p<0.01 . ICU length of stay calculated only in surviving patients.

Table 2e: Serum creatinine and urea levels according to different procalcitonin (PCT) cut-offs upon ICU admission. (Cr: creatinine; IQR: interquartile range)

PCT cut-off (ng/mL)	≤ 0.25	0.26-0.50	0.51-0.75	0.76-1.0	1.01-1.25	1.26-1.50	1.51-1.75	1.76-2.0	2.01-2.25	2.26-2.75	2.76- 3.0	>3.0
Serum Cr (mg/dL) median (IQR)	0.7 (0.6-0.9)	0.8 (0.6-1.0)	0.9 (0.7-1.2)	0.8 (0.5-1.2)	0.8 (0.6-1.2)	0.8 (0.7-1.2)	0.9 (0.7-1.0)	1.0 (0.8-1.1)	0.6 (0.4-0.8)	1.0 (0.7-1.3)	1.0 (0.6-1.4)	0.9 (0.6-1.6)
Serum Urea (mg/dL), median (IQR)	30 (21-42)	33 (23-50)	39 (29.5-63)	34 (26-59)	40 (25-59)	41 (36-56)	26 (22-42)	29 (22-56)	30 (24-38)	40 (34-47)	82 (34-47)	42 (29-55)

p=0.001 (K-Wallis) for both comparisons (*We compared serum levels of creatinine or urea according increases the PCT cutoff. We performed an “omnibus” comparison test and non if a specific group of any independent variable are statistically significantly different from each other*)

Table 3e: PCT descriptors

PCT descriptors	Statistics	Standard error
Mean	3.0100	.04111
95% confidence interval	2.222-3.797	
Median cut at 5%	1.289	
Median	0.490	
Standard deviation	10.091	
Variance	101.840	
Minimum	0.1	
Maximum	116.00	
Range	115.99	
Interquartile range	1.40	
Asymmetry	7.155	.097
Kurtosis	61.844	.194

Figure 1e: Box and whisker plot of procalcitonin upon ICU admission (data censored at 40 ng/mL)



Figure 2e: Linear regression analysis between procalcitonin and creatinine with logarithmic transformation of data

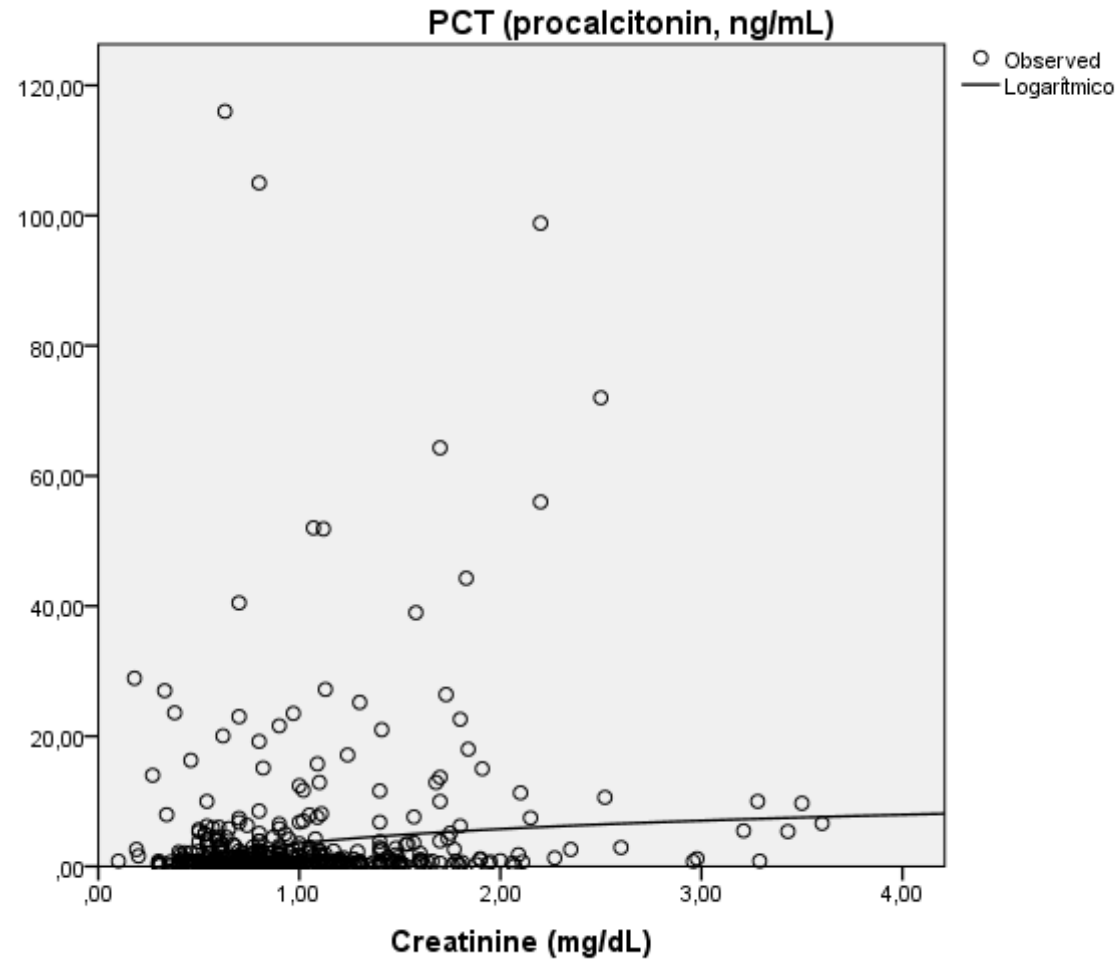


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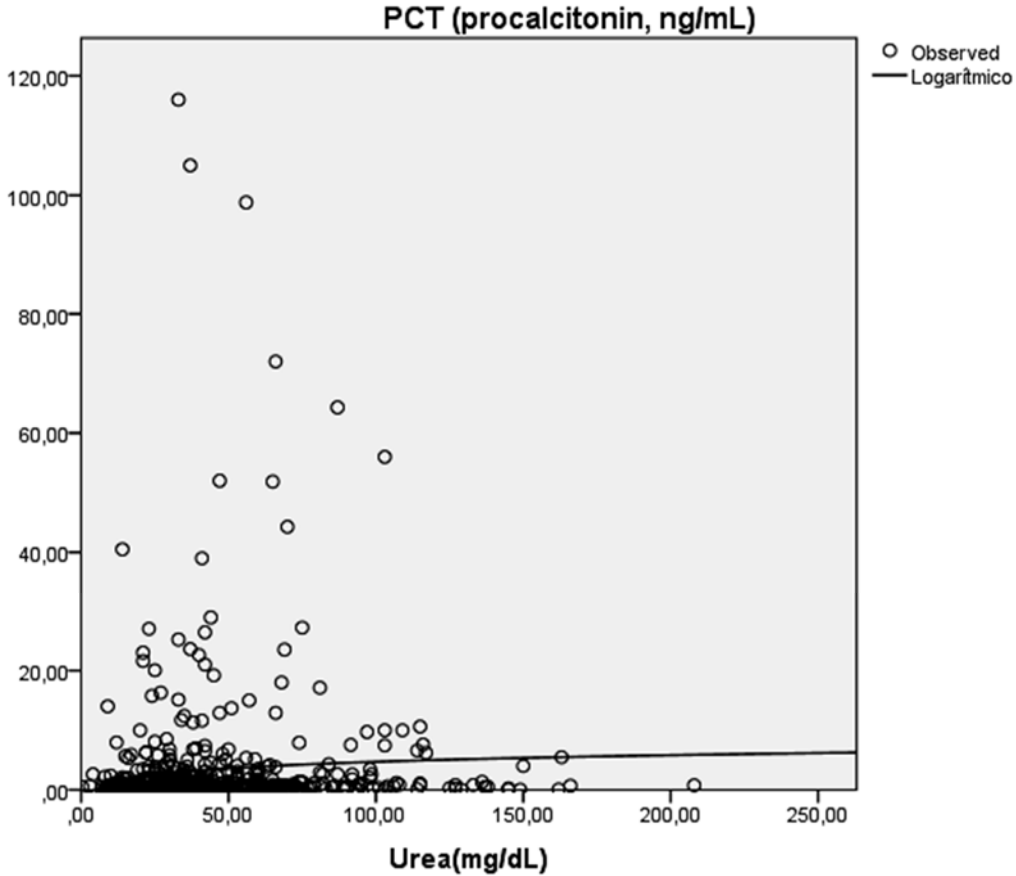


Table 4e: Interaction evaluation between clinical and laboratory variables for creatinine. The interaction was tested by the product of two explanatory variables in a multiple linear regression. Only interaction variables with statistical significance were added to the final model of multiple linear regression analysis.

Model summary

Model	R	R ²	Adjusted R ²	Standard error
1	0.216	0.047	0.037	10.069

ANOVA^a

Model	Sum of squares	Gl	Quadratic mean	F	Signification
1 Regression	2985.323	6	497.554	4.908	.000 ^b
Residue	60932.860	601	101.386		
Total	63918.163	607			

a: Dependent variable PCT b: Predictors : (constant) APACHE*white blood cells; creatinine*white blood cells; creatinine*APACHE; APACHE*white blood cells; white blood cells*chronic heart disease; creatinine*chronic heart disease

Coefficients

Model	Non-standardized coefficients		Standardized coefficients	t	signification
	B	Standard error	Beta		
1 (constant)	1.214	.638		1.902	0.58
Creatinine*APACHE	.112	.035	.148	3.212	.001
Creatinine*white blood cells	.000	.000	.201	2.611	.009
Creatinine*chronic heart disease	.226	2.416	.008	.094	.925
APACHE*white blood cells	-9.426-E6	.000	-.143	-1.924	.055
White blood cells*chronic heart disease	.000	.000	-.100	-1.235	.217
APACHE *chronic heart disease	.48	.157	.025	.308	.758

Table 5e: Impact of creatinine on procalcitonin (PCT) by multiple linear regression analysis. Interaction variables with statistical significance (creatinine*White blood cell and creatinine*APACHE II) were added to the final model.

Model summary

Model	R	R ²	Adjusted R ²	Standard error
1	0.214	0.046	0.036	10.074

ANOVA^a

Model	Sum of squares	Gl	Quadratic mean	F	Signification
1 Regression	2919.443	6	486.574	4.794	.000 ^b
Residue	60998.740	601	101.495		
Total	63918.183	607			

a: Dependent variable : PCT b: Predictors : (constant) Chronic heart disease ; white blood cells, modified APACHE II, creatinine, creatinine*white blood cells and creatinine*APACHE

Coefficients

Model	Non-standardized coefficients		Standardized coefficients	t	signification
	B	Standard error	Beta		
1 (constant)	3.979	2.609		1.525	.128
Creatinine*APACHE	.148	.112	.196	1.323	.186
Creatinine*white blood cells	.000	.000	.269	2.108	.035
Modified APACHE II	-.099	.132	-.069	-.755	.450
Creatinine	-1.563	2.552	-.074	-.612	.540
White blood cells	.000	.000	-.191	-1.757	.079
Chronic Heart Disease	-1.933	1.495	-.053	-1.293	.197

Table 6e: Interaction between clinical and laboratory variables for urea. The interaction was tested by the product of two explanatory variables in a multiple linear regression. Only interaction variables with statistical significance were added to the final model of multiple linear regression analysis.

Model summary

Model	R	R ²	Adjusted R ²	Standard error
1	0.120	0.014	0.004	10.270

ANOVA^a

Model	Sum of squares	Gl	Quadratic mean	F	Signification
1 Regression	917.748	6	152.913	1.450	.193 ^b
Residue	62976.181	597	105.488		
Total	63893.659	603			

a: Dependent variable PCT b: Predictors : (constant) urea*chronic heart disease; urea*APACHE, APACHE*white blood cells; APACHE*chronic heart disease; urea*white blood cells; white blood cells*chronic heart disease

Coefficients

Model	Non-standardized coefficients		Standardized coefficients	t	signification
	B	Standard error	Beta		
1 (constant)	1.960	.645		3.036	.002
APACHE*white blood cells	1.737E-6	.000	.026	.420	.675
white blood cells*chronic heart disease	.000	.000	-.095	-1.201	.230
APACHE*chronic heart disease	.228	.154	.014	.180	.857
urea*APACHE	.001	.001	.066	1.382	.168
urea*white blood cells	8.418E-7	.000	.041	.607	.544
Urea	.012	.038	.024	.326	.745

Table 7e: Impact of urea on procalcitonin (PCT) by multiple linear regression analysis. No Interaction variables were added to the final model.

Model summary

Model	R	R ²	Adjusted R ²	Standard error
1	0.116	0.013	0.007	10.258

ANOVA^a

Model	Sum of squares	df	Quadratic mean	F	Signification
1 Regression	857.278	4	214.320	2.037	.086 ^b
Residue	63036.380	599	105.236		
Total	63893.659	603			

a: Dependent variable : PCT b: Predictors : (constant) Chronic heart disease ; white blood cells, modified APACHE II and urea

Coefficients

Model	Non-standardized coefficients		Standardized coefficients	t	signification
	B	Standard error	Beta		
1 (constant)	.376	1.28		.330	.739
Modified APACHE II	.091	.061	.063	1.495	.135
Urea	.027	.016	.073	1.715	.087
White blood cells	4.405E-5	.000	.034	.820	.412
Chronic heart disease	-2.065	1.536	-.056	-1.344	.179