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Time to blood culture positivity as a predictor of clinical outcomes and severity in adults with bacteraemic pneumococcal pneumonia

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Background: The time to positivity of blood culture (TTP) of patients with bacteremia has been previously explored as a marker of poor clinical outcome. However, the association of TTP with clinical outcome and severity of pneumococcal bacteremic pneumonia in adults has never been studied

Material/methods: Prospective observational study carried out in 278 hospitalized adult CAP patients with positive blood culture for *Streptococcus pneumoniae* from 2009-2011.

Results: A total of 278 cases of bacteremic pneumococcal pneumonia were analyzed, median age 62 (46-79) years, 167 (60%) of the patients were male. Fifty-one percent of the cases had PSI IV-V. 21 (8%) died within 30 days after admission. The analysis of the TTP demonstrated that the first quartile of the TTP (9.2h) was the best cut-off for differentiating 2 groups of patients at risk, early (TTP <9.2 h) and late (TTP ≥9.2 h) detection groups. Early TTP was associated with a statistically significant risk of mechanical ventilation (MV) (OR 2.2); longer length of stay (LOS) (OR 6.7); higher in-hospital mortality (OR 3.7) and 30-day mortality (OR 3.0). Logistic regression, adjusted for age, sex, comorbidities, PSI, revealed early TTP as independently associated with high risk of MV (OR 4.6; 95% CI 1.6-13.0), longer LOS (OR 5.2; 95% CI 1.8-8.5) and higher in-hospital mortality (OR 5.3; 95% CI 1.5-18.5).

Conclusions: TTP is inversely related with the bacterial load in the blood. In line with this fact, our results demonstrate that TTP is an easy to obtain surrogate marker of pneumococcal pneumonia severity and a good predictor of its outcome.

Table. Clinical Outcomes

Variables	Cohort of patients	Early detection	Late detection	P Value
	n = 278	< 9.2 h n = 69	≥ 9.2 h n = 209	
Length of hospital stay (days), median (IQR)	9 (5; 14)	12 (8; 18)	8 (5; 12)	<0.001
Length of hospital stay ≥9 days, n (%)	139 (52)	47 (71)	92 (46)	<0.001
ICU admission, n (%)	87 (31)	27 (39)	60 (29)	0.60
Mechanical ventilation, n (%)				0.018
Not ventilated	216 (83)	44 (70)	172 (88)	0.029
Non-invasive	21 (8)	8 (13)	13 (7)	0.82
Invasive	22 (8)	11 (18)	11 (6)	0.007
Length of ICU stay (days), mean (IQR)	5 (3; 9)	5.5 (4; 21.5)	5 (3; 7)	0.16
ICU mortality, n (%) ^a	8 (9)	4 (15)	4 (7)	0.24
In-hospital mortality	19 (7)	10 (15)	9 (4)	0.010
30-day mortality, n (%)	21 (8)	10 (15)	11 (5)	0.018

Abbreviations: ICU = intensive care unit; IQR = interquartile range. ^a 87 patients in the overall cohort, 45 patients in the early detection group and 42 patients in the late detection group were used to calculate the percentages.