



ELECTRONIC SUPPLEMENTARY MATERIAL

Neu C, Esper Trembl R, Baumbach P *et al.*: Cholinesterase activities and sepsis-associated encephalopathy in viral versus nonviral sepsis

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Receiver operating characteristic analyses for ICU mortality

We used receiver operating characteristic analysis¹ to obtain thresholds (i.e., cut-offs) of acetylcholinesterase (AChE) and butyrylcholinesterase (BChE) levels for the prediction of ICU mortality. The optimal cut-off was chosen based on Youden's Index.²

eTable 1 Diagnostic performance (receiver operating characteristic analysis) of AChE and BChE levels for the prediction of ICU mortality. The results are presented for patients with viral sepsis.

	AChE		BChE	
	T ₁	T ₂	T ₁	T ₂
Threshold (U·L ⁻¹)	< 6,104	< 4,809	< 1,943	< 1,198
Sensitivity (0-1)	0.86	0.71	0.68	0.48
Negative predictive value (0-1)	0.25	0.30	0.28	0.56
Specificity (0-1)	0.33	0.55	0.55	0.90
Positive predictive value (0-1)	0.90	0.88	0.87	0.86
Accuracy (0-1)	0.44	0.59	0.57	0.81
Balanced accuracy	0.60	0.63	0.62	0.69
Area under the curve	0.57	0.63	0.59	0.70
ICU-mortality (survivor), <i>n</i>	86	78	86	78
ICU-mortality (nonsurvivor), <i>n</i>	22	21	22	21

AChE = acetylcholinesterase; BChE = butyrylcholinesterase; ICU = intensive care unit; T₁ = 3±1 days after onset of sepsis; T₂ = 7±1 days after onset of sepsis

eTable 2 Diagnostic performance (receiver operating characteristic analysis) of AChE and BChE levels for the prediction of ICU mortality. The results are presented for patients with nonviral sepsis.

	AChE		BChE	
	T ₁	T ₂	T ₁	T ₂
Threshold (U·L ⁻¹)	< 3,734	< 5,311	< 842	< 801
Sensitivity (0-1)	0.39	1.00	0.56	0.50
Negative predictive value (0-1)	0.22	0.15	0.32	0.29
Specificity (0-1)	0.75	0.16	0.79	0.82
Positive predictive value (0-1)	0.87	1.00	0.91	0.92
Accuracy (0-1)	0.69	0.27	0.75	0.78
Balanced accuracy	0.57	0.58	0.68	0.66
Area under the curve	0.53	0.52	0.69	0.69
ICU-mortality (survivor), <i>n</i>	99	94	99	94
ICU-mortality (non-survivor), <i>n</i>	18	14	18	14

AChE = acetylcholinesterase; BChE = butyrylcholinesterase; ICU = intensive care unit; T₁ = 3±1 days after onset of sepsis; T₂ = 7±1 days after onset of sepsis

eTable 3 Associations between AChE and BChE activities with inflammatory markers and laboratory data of patients with nonviral sepsis

	AChE					BChE					
Variable	time	ρ^a	95%CI		P value	N	ρ^a	95%CI		P value	N
Hb (mmol·L ⁻¹)	T ₁	0.43	0.27	0.57	<0.001	116	0.17	-0.02	0.34	0.076	116
	T ₂	0.43	0.25	0.57	<0.001	102	0.11	-0.08	0.30	0.254	102
Albumin (g·L ⁻¹)	T ₁	0.01	-0.17	0.19	0.912	117	0.26	0.08	0.42	0.005	117
	T ₂	0.01	-0.18	0.20	0.919	104	0.24	0.05	0.41	0.016	104
ChE (μmol·L ⁻¹)	T ₁	0.34	0.17	0.49	<0.001	117	0.90	0.86	0.93	<0.001	117
	T ₂	0.14	-0.06	0.33	0.164	101	0.73	0.63	0.81	<0.001	101
PCT (ng·L ⁻¹)	T ₁	-0.17	-0.35	0.01	0.061	116	-0.31	-0.47	-0.14	<0.001	116
	T ₂	-0.18	-0.36	0.01	0.064	104	-0.30	-0.46	-0.11	0.002	104
CRP (mg·L ⁻¹)	T ₁	0.02	-0.16	0.20	0.803	116	-0.25	-0.41	-0.07	0.006	116
	T ₂	-0.15	-0.33	0.05	0.148	100	-0.18	-0.36	0.02	0.072	100

^aSpearman's rank correlation coefficient with 95% CI and P value (P<0.05 are printed in bold)
AChE = acetylcholinesterase; BChE = butyrylcholinesterase; ChE = cholinesterase; CI = confidence interval; CRP = C-reactive protein; Hb = hemoglobin; N = number of patients with nonmissing data; PCT = procalcitonin; T₁ = 3±1 days after onset of sepsis; T₂ = 7±1 days after onset of sepsis

References

1. *Zweig MH, Campbell G.* Receiver-operating characteristic (ROC) plots: a fundamental evaluation tool in clinical medicine. *Clinical Chemistry* 1993; 39: 561–77.
2. *Schisterman EF, Perkins NJ, Liu A, Bondell H.* Optimal cut-point and its corresponding Youden Index to discriminate individuals using pooled blood samples. *Epidemiology* 2005; 16: 73–81.