
LIVES2017: New outcome prediction score



A newly validated outcome prediction score (PEAR score), based on information available at ICU admission, is simple, quick and easily understandable, and has high potential clinical utility for risk prediction, according to Kenneth Christopher, of Brigham and Women's Hospital, Boston. The research was presented at LIVES 2017, the 30th annual congress of the European Society of Intensive Care Medicine, meeting in Vienna last month.

Based on the hypothesis that a simple risk score of commonly available information is predictive of 90-day all-cause mortality, the study was a two-centre, registry-based observational cohort study conducted between 1997 and 2012 in medical and surgical ICUs in academic medical centres in Boston, USU. At ICU admission platelet, eosinophil count and red cell distribution width was determined.

The PEAR (Platelet, Eosinophil, Age, Red cell distribution width) prediction score comprises:

- Platelet count
- Peripheral blood eosinophil count
- Age
- Red cell distribution width
- Gender
- Patient type (surgical vs medical)

The clinical prediction model used a logistic regression risk of 90-day mortality as a function of predictors at ICU admission. The model was transformed to a simplified integer-based score.

The derivation cohort consisted of 27,706 patients with a mean age of 62.5, 56% male, and 53% surgical ICU patients. The median uL eosinophil count was 80, the mean red cell distribution width 14.7 and the mean k/uL platelet count was 244. In the validation cohort, 90-day mortality was 18.7%. Of patients categorised as very high risk (> 36 points), 34.9% of patients died within 90 days, as against 5.5% of low-risk patients (0-20 risk score points).

The validation cohort consisted of 48,385 patients with a mean age of 63 years, 59% male, 46% surgical patients and a 90-day mortality rate of 16.6%.

The odds ratio for 90-day post-discharge mortality per 1 risk score point:

OR (95% CI) P-value

Risk score 1.08 (1.08-1.08) <0.001

The odds ratio for 90-day post-discharge mortality validation cohort

Risk score category	OR (95% CI)	P-value
Low	1.00 (Reference)	
Intermediate	1.88 (1.71-2.07)	<0.001
High	3.66 (3.35-3.99)	<0.001
Very high	9.17 (8.43-9.98)	<0.001

Performance analysis of the PEAR score against APACHE II was completed in a subset of the validation cohort (n=341).

Discrimination for 90-day post-charge mortality n=341

Risk score category	AUC	Difference in model discrimination	P-value
APACHE II	0.68 (95% CI 0.62-0.74)		
Risk score	0.72 (95% CI 0.67-0.78)	0.19	

Roeker LE, Moromizato T, Gibbons F, Quraishi SA, Christopher K (2017) Derivation and validation of the PEAR score to predict outcome in critically ill patients.

The congress abstract is available at <http://www.professionalabstracts.com/esicm2017/iplanner/#/presentation/1929>

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