

# Reply to “Can the simple parameter of peripheral hematological examination predict the outcome in patients with septic acute kidney injury?”

Yu Chen\*, Fang Feng, Min Li, Jiao-Jiao Yuan, Xue-Ni Chang, Bao-Hua Wei, Hang Du, Chen-Ming Dong

Department of Intensive Care Unit, Lanzhou University Second Hospital, Lanzhou, Gansu, China

Dear Editor,

We thank Dr. Peng-Hui Wang and Fa-Kung Lee for their comments regarding our study.<sup>1</sup> However, we still believe that prevention is better than cure. So, we designed this pilot study, and we got the conclusion that the PLR might be an effective factor in predicting a worse prognosis of the septic AKI patients. It is true that we did not expect our research to have an enormous impact on the prevention of septic

acute kidney injury (AKI) patients, and also, we do not really believe that a single indicator can improve the mortality rate of such patients.

We reconducted statistics on the data. Indeed, our previous statistics were wrong. Thank you very much for pointing out our mistakes. SPSS 21.0 was used for statistical analysis, Chicago, IL, USA) analyzed the data. If the measurement data follow the normal distribution, it is expressed as mean  $\pm$  standard deviation ( $\bar{x} \pm s$ ). The comparison between the 2 groups adopts the T-test, and the Q-Q normal probability graph is used for the normal test. If the measurement data do not follow the normal distribution, it will be represented by median M and quartile (lower quartile and upper quartile). The comparison between the 2 groups will be performed by the Mann-Whitney U test in nonparametric test. Statistical data were represented by n (%), and dichotomies between the 2 groups were compared by the Pearson Chi-square test. A logistic regression analysis was conducted to screen the risk factors, and the selected factors were performed using a

**Table 1**

**Basal information of septic patients with AKI at day 1 of ICU admission (corrected)**

Characteristics	Survivors	Nonsurvivors	<i>P</i>
Patients	26	41	
Age (y)	61.0 $\pm$ 2.9	59.0 $\pm$ 2.9	0.934
Gender (male/female)	12/14	24/17	0.899
Temperature (°C)	37.4 $\pm$ 0.21	37.2 $\pm$ 0.18	0.621
Respiration (bpm)	26 $\pm$ 2	29 $\pm$ 1	0.063
SBP (mmHg)	97 $\pm$ 5	101 $\pm$ 5	0.403
DBP (mmHg)	59 $\pm$ 3	59 $\pm$ 3	0.223
APACHE II Score	16.9 $\pm$ 3.1	17.2 $\pm$ 2.8	0.698
Mechanical	15/11	4/37	<0.001
Ventilation (no/yes)			
CRRT (no/yes)	2/24	7/34	0.465
Urine output (average) (ml/h)	26	17	0.027
Causes of sepsis, n(%)			
Pneumonia	18 (69)	29 (72)	
BSI	4 (15)	7 (17)	
Urosepsis	2 (8)	2 (4)	
GI/biliary	1 (4)	2 (6)	
Others	1 (4)	1 (1)	
WBC (10 <sup>9</sup> /L)	17.8 $\pm$ 2.7	12.8 $\pm$ 2.3	0.199
LY (10 <sup>9</sup> /L)	0.86 $\pm$ 0.15	0.97 $\pm$ 0.17	0.605
PLT (10 <sup>9</sup> /L)	71 $\pm$ 9	113 $\pm$ 12	0.009
PLR	115 $\pm$ 14	208 $\pm$ 20	<0.001
BUN (mmol/L)	14.9 (11.2, 17.2)	16.1 (11.4, 21.4)	<0.001
Scr ( $\mu$ mol/L)	244 (178.4, 269.6)	242.8 (164.3, 300.5)	0.087
Lac (mmol/L)	4.3 (2.8, 5.1)	6.2 (2.5, 8.9)	0.005
PCT (mmol/L)	65.3 (18.2, 100)	59.2 (10.9, 100)	<0.001

AKI = acute kidney injury; APACHE = acute physiology and chronic health evaluation; BSI = blood stream infection; BUN = blood urea nitrogen; CRRT = continuous renal replacement treatment; DBP = diastole blood pressure; GI = gastrointestinal infection; Lac = lactate; LY = lymphocyte; PCT = procalcitonin; PLR = platelet/lymphocyte ratio; PLT = platelet; SBP = systolic blood pressure; Scr = serum creatinine; WBC = white blood cell.

**Table 2**

**Univariate analysis of factors associated mortality in septic patients with AKI (corrected)**

	OR	OR (95% CI)
Age (y)	1.384	(1.035, 1.851)
Gender (male/female)	1.011	(1.003, 1.088)
Temperature (°C)	1.023	(1.011, 1.799)
Respiration (bpm)	1.017	(1.003, 1.099)
SBP (mmHg)	1.683	(1.642, 2.481)
DBP (mmHg)	1.992	(1.389, 2.857)
APACHE II Score	1.621	(1.228, 2.139)
Mechanical ventilation (no/yes)	1.079	(1.022, 1.289)
WBC (10 <sup>9</sup> /L)	1.975	(1.362, 2.865)
LY (10 <sup>9</sup> /L)	2.994	(2.250, 3.985)
PLT (10 <sup>9</sup> /L)	1.989	(1.979, 1.998)
PLR	1.021	(1.003, 1.039)
BUN (mmol/L)	1.997	(1.986, 2.999)
Scr ( $\mu$ mol/L)	1.016	(1.001, 1.031)
Lac (mmol/L)	1.964	(1.944, 1.994)
PCT (mmol/L)	1.013	(1.003, 1.024)

AKI = acute kidney injury; APACHE = acute physiology and chronic health evaluation; BUN = blood urea nitrogen; CI = confidence interval; DBP = diastole blood pressure; Lac = lactate; LY = lymphocyte; OR = odds ratio; PCT = procalcitonin; PLR = platelet/lymphocyte ratio; PLT = platelet; SBP = systolic blood pressure; Scr = serum creatinine; WBC = white blood cell.

\*Address correspondence. Dr. Yu Chen, Department of Intensive Care Unit, Lanzhou University Second Hospital, 82, Cuiying Gate, Chengguanqu, Lanzhou, Gansu, China. E-mail address: chenyu14@zu.edu.cn (Y. Chen).

Conflicts of interest: The authors declare that they have no conflicts of interest related to the subject matter or materials discussed in this article.

Journal of Chinese Medical Association. (2021) 84: 338-339.

Received December 28, 2020; accepted January 11, 2021.

doi: 10.1097/JCMA.0000000000000493.

Copyright © 2021, the Chinese Medical Association. This is an open access article under the CCBY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>)

multiple logistic regression analysis. All tests were two-sided, and  $p < 0.05$  was defined as statistically significant.

The corrected data are shown in Tables 1 and 2. And then, about the levels of platelets, our research showed survived patients had lower levels of platelets than died patients did ( $71 \times 10^9/L$  vs.  $113 \times 10^9/L$ ). Previous studies have suggested that thrombocytopenia is associated with poor prognosis.<sup>2-4</sup> However, the data were collected at day 1 of ICU admission in our research, and that, according to research which did by Chen-Fei Zheng and his colleagues,<sup>5</sup> showed that the preoperative PLR was associated in a U-shaped pattern with survival among patients with AKI. After a detailed analysis of this problem, we believe that such a result was directly related to the small sample size.

This study is part of the EACG study. At present, we are still continuing to expand the sample size to further illustrate whether PLR can truly predict the occurrence of AKI in sepsis.

## REFERENCES

1. Lee FK, Huang HY, Wang PH. Can the simple parameter of peripheral hematological examination predict the outcome in patients with septic acute kidney injury? *J Chin Med Assoc* 2021;**84**:336-7.
2. Fountain EM, Arepally GM. Etiology and complications of thrombocytopenia in hospitalized medical patients. *J Thromb Thrombolysis* 2017;**43**:429-36.
3. Le RJ, Larsen CM, Fenstad ER, McCully RB, Frantz RP, McGoon MD, et al. Thrombocytopenia independently predicts death in idiopathic PAH. *Heart Lung* 2019;**48**:34-8.
4. He Z, Wang B, Li Y, Du Y, Ma H, Li X, et al. Severe fever with thrombocytopenia syndrome: a systematic review and meta-analysis of epidemiology, clinical signs, routine laboratory diagnosis, risk factors, and outcomes. *BMC Infect Dis* 2020;**20**:575.
5. Zheng CF, Liu WY, Zeng FF, Zheng MH, Shi HY, Zhou Y, et al. Prognostic value of platelet-to-lymphocyte ratios among critically ill patients with acute kidney injury. *Crit Care* 2017;**21**:238.