The Comparison between Sepsis 1.0 and Sepsis 3.0 in Database of Severe Infection in Critical Illness: A Retrospective Study

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Wei Zhang  
zhangwei_hxicu@163.com  
Affiliated Hospital of Zunyi Medical College  
Corresponding Author  
ORCiD: 0000-0002-8706-6082

Yan Zheng  
Linyi People's Hospital

Juan Gu  
Zunyi Medical University

Yan Kang  
Sichuan University West China Hospital

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Abstract

**Objective** To compared the Sepsis 1.0 criterial with the Sepsis 3.0 criteria predict the efficacy of all-caused mortality of in-hospital in critically ill patients with severe infection.

**Design** This is a retrospective and cohort study based on the database of severe infection.

**Setting** A 48-bed general intensive care unit in affiliated hospital of University. Patients Critically ill patients with suspected infection based on the electronic health records from 1 January to 31 December, 2015.

**Interventions** None.

**Measurements** The variables of exposures included: quick sequential organ failure assessment (qSOFA), systemic inflammatory response syndrome (SIRS) score and sequential organ failure assessment (SOFA). Main outcomes and measures: for predictive validity, we found that the discrimination for hospital mortality was more common with sepsis than with uncomplicated infections. Results are reported as the area under the receiver operating characteristic curve (AUROC).

**Main Results** In the primary cohort, 873 patients had suspected infection cohort (n=634), of whom 188 (29.7%) died; and with the non-infection cohort (n=239), 26 patients died (10.9%). Among intensive care unit (ICU) cases in the infection cohort, the predictive validity for hospital mortality was higher for Sepsis 3.0 (SOFA) criteria (AUROC=0.702; 95% CI, 0.665–0.737; p≤0.01 for both) than for Sepsis 1.0 (SIRS) criteria (AUROC=0.533; 95% confidence interval [95%CI], 0.493–0.572).

**Conclusions** In our study, we found the Sepsis 3.0 criteria is able to accurately predict the prognosis in critically ill patients with severe infection, and its predictive efficacy is superior to Sepsis 1.0 criteria.
Introduction

Despite considerable advances, sepsis is still common and associated with high morbidity and mortality (1, 2). Before the publication of the third international consensus definitions for sepsis and septic shock (Sepsis 3.0), two international consensus conferences in 1991 (Sepsis 1.0) and 2001 (Sepsis 2.0) used expert opinion to generate the current definitions based on a host’ systemic inflammatory response syndrome (SIRS) to infection (3, 4); However, those two definitions have high sensitivity, but low specificity (5). Recently, one study of using data from the Australia and New Zealand Intensive Care Society (ANZICS) (6), became the prelude of giving birth to the new Sepsis 3.0 definition due to
discover the flaws of SIRS criteria (Sepsis 1.0 and Sepsis 2.0) to define severe sepsis (7).

In 2016, Sepsis 3.0 were published in JAMA: The Journal of the American Medical Association, where sepsis was defined as “life-threatening organ dysfunction due to a dysregulated host response to infection” (8).

In modified definitions of sepsis, the quick sequential (sepsis related) organ failure assessment (qSOFA) was recommended for sepsis screening in the outside wards of intensive care unit (ICU) (8) and has been applied to some clinical studies and showed good predictive validity for mortality and admission in ICU (9-13).

Simultaneously, the sequential organ failure assessment (SOFA) also became the basis of the Sepsis 3.0 definition. After the new Sepsis definition was published, however, some experts thought that qSOFA does not replace SIRS in the definition of sepsis (14).

Above all, the Sepsis 3.0 definition derived from large data-sets from developed countries
and had been validated by the data from the developed countries (15, 16). We aim to compared the Sepsis 1.0 criterial with the Sepsis 3.0 criteria predict the efficacy of all-caused mortality of in-hospital in critically ill patients with severe infection.

Materials And Methods

Study design

This is a retrospective cohort study, and it was approved by the Biomedical Ethics Committee. This study was registered at the Chinese Clinical Trial Register (CCTR number: ChiCTR-ORC-16010138, registered 12 December 2016). URL: http://www.chictr.org.cn/listbycreater.aspx. Written informed consent was not obtained from the patients or their relatives due to the retrospective study design of using the electronic health records and no additional interventions were given to the subjects.

Setting

We conducted the study in a 48-bed general intensive care unit (GICU) of Sichuan University West China Hospital, (Chengdu, Sichuan Province, China). The periods of recruitment in the study included one whole year from 1 January to 31 December 2015. We identified those with suspected infection for the purpose of criteria comparison among 1243 electronic health records. The deadline for follow-up time was defined as the end of in-hospital for every patient according to the electronic health records.

Participants
The included criteria of participants:

1. The participants with suspected infection need to simultaneously meet the following three requirements (17).

1. Firstly, the initial episode of suspected infection was defined as a combination of body fluid cultures and antibiotics. Secondly, it is necessary that the combination of antibiotics and culture sampling occurred within a specific time limits. If the antibiotic was administered first, the culture sampling must have been obtained within 24 hours. If the culture sampling occurred first, antibiotic administration must have been instigated within 72 hours. Finally, the “onset” of infection included the time when the first of the 2 events took place.

2. Age ≥ 18 years.

3. Length of stay in GICU ≥ 24 hours.

Outcome Variables

In the study, we followed up all patients after hospital discharge using their medical records and all-cause in-hospital mortality was the primary outcome. The secondary outcome was the risks of an ICU stay of 3 or more days. The exposures of risk factors for in-hospital death included scores of SIRS, qSOFA and SOFA.

Effect Modifiers and Potential Confounders

The major effect modifiers were age and acute physiology and chronic health evaluation (APACHE) II in the study due to the hospital mortality gradually increased with the increasing age and APACHE II; sex was the potential confounders due to the difference between male and female was evident in hospital mortality.

Data Sources and Bias Control
Each component of SIRS, qSOFA and SOFA derived from indicators of every medical record. For the time window from 48 hours before to 24 hours after the onset of infection, we calculated the maximum score of SIRS, qSOFA, and SOFA (17). In sepsis occurring before, near the moment of, or after infection, organ dysfunction is recognized by clinicians. Before to up to 24 hours after the onset of infection, we calculated a change of 2 points or more in the SOFA score from up to 48 hours.

The researchers in this study collected general information from medical records of patients admitted to the ICU: medical identification, demographic characteristics, vital signs, and results of laboratory tests. We calculated the qSOFA, SIRS and SOFA scores for each patient using those data. Acute Physiology and APACHE II collected to assess the illness severity of members of the enrolled participant.

These study designers did not participate in the data collection, and those who participated in data collection of the study were blind to the study design.

Comparability of Assessment Methods

The comparable cohorts including Sepsis 1.0 and Sepsis 3.0 were generated from the database of critically ill patients with infection. We compared with the baseline characteristics and in-hospital death of both cohorts.

Statistical Analysis

Descriptive variables with a normal distribution were expressed as means ± standard deviations and were analysed using an independent sample t test. We expressed variables with a skewed distribution as medians and quartiles and analysed them using the Mann-Whitney U test. We employed the χ² test for comparison of frequencies. To assess the
baseline risk of outcomes, we analysed the demographic variables that significantly differed among patients with opposite outcomes by means of univariate and multivariate logistic regression analysis; we determined the independent predictors. We constructed and compared the area under the curve of receiver operating characteristic (AUROC) was determined to assess predictive values.

We performed all the statistical analyses using MedCalc® (version 15.8) statistical software (18), and Empower Stats software. All the statistical tests were two-tailed, and $P<0.05$ was considered significant. We considered the area under the receiver operating characteristic curve (AUROC) to be poor at $0.6 - 0.7$, adequate at $0.7 - 0.8$, good at $0.8 - 0.9$, and excellent at $0.9$ or higher (19).

Results

A flow diagram of the study appears SFig 1. As described in the methods section, 1243 patients were evaluated in the enrolment period; 370 patients were excluded for the following reasons: 1) 121 patients due to secondary admission in ICU; 2) 247 patients due to ICU length of stay under 24 hours; 3) 2 patients due to age under 18 years. There were no in-hospital patients were drop-outs. We finally enrolled 634 patients with infections and complete the clinical database.

Distribution of Hospital Mortality

The distribution of hospital mortality by SIRS, qSOFA and SOFA scores (four groups: $<5$;
5–10; 10–15; ≥15) appear in Fig 1. With increasing scores, differences in hospital mortality were evident by the SOFA score, but that was not the case with either in SIRS or qSOFA.

Study Cohort Characteristics

The baseline characteristics of study participants are listed in Table 1. We calculated APACHE II scores for all enrolled patients upon GICU arrival, and the mean value was 24.6±7.2. SOFA scores were available for 634 patients, and the mean value was 9.7±3.9. Among the whole cohort, hospital mortality was 29.7%; that for the Sepsis 1.0 and Sepsis 3.0 cohorts was 31.1% and 29.8%, respectively. The median length of ICU stay was 13 (range 7–24) days. The median length of hospital stay was 22 (range 12.5–35) days. The proportion of male patients was 65.9% (418 of 634).

The qSOFA, SIRS, SOFA, and APACHE II scores were higher in non-survivors than in survivors; they did not differ significantly between the Sepsis 1.0 and Sepsis 3.0 cohorts but SIRS scores were higher in the Sepsis 1.0 than in the Sepsis 3.0 cohorts. The baseline risk variables were age (years) and sex. Age was higher in non-survivors than in survivors; however, it did not differ significantly between Sepsis 1.0 and Sepsis 3.0 cohorts. There was no significant difference in sex between non-survivors and survivors or between Sepsis 1.0 and Sepsis 3.0 cohorts.

Univariate Regression Analysis

When we analysed the risks of hospital mortality by univariate regression (Table 2), age was an independent predictor of mortality, but an ICU stay of 3 days or more was not. Sex was not an independent predictor of either mortality or an ICU stay of 3 or more days. APACHE II, SOFA, and qSOFA scores were all independent predictors of mortality; however, only qSOFA was an independent predictor of an ICU stay of 3 or more days. In addition, administrations of continuous renal replacement therapy, mechanical ventilation and
vasopressors were all independent predictors of mortality; however only the administration of mechanical ventilation was an independent predictor of an ICU stay of 3 or more days.

Multivariate Logistic Regression Analysis

The outcomes of multivariate logistic regression analysis of the risk factors of hospital mortality and intensive care unit stay of 3 or more days appear in Table 3. In the non-adjusted model, the odd ratios (OR), 95% confidence intervals (CI) and p value on the risk factors of hospital mortality and intensive care unit stay of 3 or more days for qSOFA, SIRS and SOFA were respectively 1.58 (1.25, 1.99), <0.01 and 1.26 (1.02, 1.56), 0.03; 1.13 (0.96, 1.33), 0.15 and 1.15 (0.98, 1.34), 0.09; as well as 1.22 (1.16, 1.28), <0.01 and 0.99 (0.95, 1.03), 0.51. After being adjusted using age and sex, they were respectively 1.70 (1.34, 2.15), <0.01 and 1.27 (1.03, 1.57), 0.03; 1.24 (1.04, 1.49), 0.02 and 1.16 (0.99, 1.36), 0.07; as well as 1.23 (1.17, 1.29), <0.01 and 0.99 (0.95, 1.03), 0.53. If we adjusted APACHE II, they were respectively 1.17 (0.90, 1.53), 0.23 and 1.27 (1.02, 1.58), 0.04; 1.00 (0.84, 1.20), 0.96 and 1.14 (0.98, 1.33), 0.10; as well as 1.12 (1.05, 1.19), <0.01 and 0.97 (0.92, 1.02), 0.18.

Predictive Efficacy

The area under the receiver operating characteristic curves (AUROCs) for the baseline risk model (age for mortality), qSOFA, SIRS, SOFA, and APACHE II appear in Fig 2. The AUC value for the baseline risk model was 0.614 for prediction of hospital mortality. The AUC value for the baseline risk model for predicting mortality was much lower than for APACHE II and SOFA (p<0.05), but it was higher than for SIRS (p<0.05). For prediction of hospital mortality, the baseline risk model achieved a similar AUC value to the qSOFA score (p=0.415). Most importantly, the AUC value for the SOFA model for predicting mortality was much higher than for SIRS and qSOFA (p<0.01) (Fig 2).
The AUCs of the predictive model for SIRS, qSOFA and SOFA when combined with age showed a clear increase (STable 1). In particular, age was an independent baseline risk variable and improved the prognostic performance of qSOFA, even attaining the level in the original study (0.63 vs 0.64). Discrimination of hospital mortality using SIRS (AUC=0.533) was much lower than the baseline model of age, qSOFA, and SOFA. However, the AUC increased to 0.63 upon combination with age and also attained the level of the original study (0.65 vs 0.66). Regarding discrimination of hospital mortality using SOFA, we found that AUC is much better than qSOFA and SIRS: 0.702 vs. 0.533 and 0.702 vs. 0.585, respectively, pairwise comparison, p≤0.01. The AUC in our study attained 0.734 when combined with age and equalled the value of the original study (0.73 vs 0.74).

Discussion
In the present study from the data of severe infection in GICU, we found the predictive validity of prognostic assessment is higher for the Sepsis 3.0 criteria than the Sepsis 1.0 criteria. In contrast, the predictive efficacy of SOFA and SIRS scores in our study was lower than that of the data from the developed counties.

As noted earlier, sepsis was defined as a—“life-threatening organ dysfunction due to a dysregulated host response to infection” by the Third International Consensus Definitions Task Force(8). With its new definitions, the task force constructed potential clinical criteria and validated using the data from the developed countries(15).
Using the qSOFA assessment system as a screening tool, we may miss approximately one-third of patients with infections at high risk of death; that, suggests it may be unfit for critically ill patients with severe infection in ICUs. A similar result was reported in 2016 (15). In our study, if we use the Sepsis 1.0 criteria, we found that we may miss more than one-sixth of patients with infection at high risk of death. Interestingly, using the Sepsis 3.0 criteria, the rate of exclusion was zero; this suggests that the clinical criteria in the new definitions for sepsis and septic shock may be more appropriate for critically ill patients with infection.

In the present investigation, hospital mortality was reduced to zero in patients with infection and SOFA scores under 5. When SOFA scores exceeded 5 points, it increased sharply (Fig. 1C). Regarding hospital mortality and SIRS scores, the number of patients who died was higher with 0 point than with 1 point, but the difference was not statistically significant (p > 0.05); hospital mortality was likewise not statistically significant in variance analysis of subgroups with scores of 0-4 points (p > 0.05) (Fig. 1B). With respect to hospital mortality and qSOFA scores, variance analysis of subgroups with 3 points in a pairwise comparison with those with 2, 1, and 0 points showed statistical significance; the cut-off value of 2 points was optimal (Fig. 1A).

Hitherto, comparative studies on the use of qSOFA as a screening tool in non-ICU settings have demonstrated its efficacy in sepsis diagnosis(9-11).
However, the position was not clear with ICUs? In the present investigation, we found the AUC of qSOFA to be much lower than in the original study for predicting hospital mortality in patients with infection in ICUs (0.585 vs. 0.66) (15).

One reason for the discrepancy may be that the illness severity in the cohort of the present study was more severe than that in the matching cohort of the original study.

Strengths
Our study has several strengths. Firstly, the data of our study are current and present over a period of one whole year (2015) due to the time that we designed the study was just at which the Sepsis 3.0 had been published for more than one year. Secondly, the data we collected during the time window of infection or suspected infection consist of physiological or laboratory measurements that were retrospectively collected for routine monitoring data and are therefore unlikely to be biased.

Limitations
This study has several limitations. First, we conducted a single-centre clinical investigation in a province of southwest China. Second, we did not include comorbidities owing to the states of construction of the database, which was still in an initial stage. Third, the high morbidity and mortality in this study may to some extent limit its generalization under the Sepsis 3.0 definition.

Conclusions
In our study, we found the Sepsis 3.0 criteria is able to accurately predict the prognosis in critically ill patients with severe infection, and its predictive efficacy is superior to Sepsis 1,0 criteria.
Declaration

Ethics approval and consent to participate

This study was approved by the Ethics Committee of Sichuan University West China Hospital (No. 315, 2016). Due to the retrospective study design involving electronic health records and no additional interventions, written informed consent was not obtained from the patients or their relatives.

Consent to publish

All authors have read and approved the manuscript version, and agree to submit for consideration for publication in the journal.

Competing interests

(1) All authors have no relationships with companies that might have an interest in the submitted work over the previous 5 years; (2) their spouses, partners, or children have no financial relationships that may be relevant to the submitted work; and (3) none of the authors have nonfinancial interests that may be relevant to the submitted work.

There are no ethical/legal conflicts involved in the article.

Availability of data and materials

We stated that all the data and materials were true and available in the study. The data in the study were deposited to the Chinese Clinical Trial Register Center (URL: http://www.chictr.org.cn/ listbycreate.aspx).

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Authors' Contributions

Wei Zhang had full access to all of the data in the study and accepts responsibility for the
data management and accuracy of the data analysis. Study concept and design: Wei Zhang and Yan Kang. Acquisition, analysis, and interpretation of data: Wei Zhang, Juan Gu, and Yan Zheng. Drafting of the manuscript: Wei Zhang, Yan Zheng, and Juan Gu. Critical revision of the manuscript for important intellectual content: Juan Gu and Yan Zheng. Administrative, technical, or material support: Wei Zhang and Yan Zheng. Study supervision: Juan Gu and Yan Kang. All authors agreed to the final version before submission. Wei Zhang is the study guarantor.

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Tables

Table 1. Baseline characteristics of the study cohort
| Characteristic | Entire cohort N=634 | Sepsis 1.0 N=540 | Sepsis 3.0 N=631 | P value | Survivors N=446 | Non-survivors N=188 | P value |
|---------------|---------------------|------------------|------------------|---------|-----------------|----------------------|---------|
| Age, years    | 58.4 ± 17.6         | 57.7 ± 17.7      | 58.4 ± 17.6      | 0.744   | 56.4 ± 17.1     | 62.3 ± 18.0          | <0.001  |
| male Sex, (N-%) | 418 (65.9)         | 360 (66.7)       | 417 (66.1)       | 0.675   | 287 (64.3%)     | 131 (69.7%)          | 0.196   |
| APACHE II     | 24.6 ± 7.2          | 24.9 ± 7.4       | 24.7 ± 7.2       | 0.660   | 22.9 ± 6.6      | 28.8 ± 7.1           | <0.001  |
| SOFA          | 9.7 ± 3.9           | 9.8 ± 3.9        | 9.7 ± 3.8        | 0.452   | 8.9 ± 3.6       | 11.7 ± 3.7           | <0.001  |
| SIRS          | 2.6 ± 1.0           | 2.9 ± 0.8        | 2.6 ± 1.0        | <0.001  | 2.5 ± 1.0       | 2.6 ± 1.0            | 0.173   |
| qSOFA         | 1.8 ± 0.8           | 1.9 ± 0.7        | 1.8 ± 0.8        | 0.068   | 1.7 ± 0.8       | 2.0 ± 0.7            | <0.001  |
| Hospital length of stay, median (IQR), d | 22 (12.2-35)       | 21.0 (12.0-35.0) | 21.0 (12.0-33.0) | 0.824   | 25 (15-39)      | 16 (8.8-25)          | <0.001  |
| ICU length of stay, median (IQR), d | 13 (7-24)          | 11.0 (6.0-21.0)  | 11.0 (6.0-21.0)  | 0.774   | 14 (7.2-26)     | 11.5 (6-20)          | 0.002   |
| 28-days mechanical ventilation, median (IQR), d | 8 (4-16)           | 6.0 (3.0-14.8)   | 6.0 (3.0-14.0)   | 0.649   | 8 (3-15)        | 10.5 (6-18)          | <0.001  |
| Duration of CRRT, median (IQR), d | 10 (5-20)          | 8.0 (4.0-16.5)   | 9.0 (4.2-17.0)   | 0.872   | 9.5 (5.2-23.5)  | 10 (5-15)            | 0.381   |
| Mechanical ventilation, (N-%) | 573 (90.4%)        | 489 (90.6)       | 573 (90.8)       | 0.767   | 389 (87.2)      | 184 (97.9)           | <0.001  |
| **CRRT (N-%) | 109 (17.2)          | 96 (17.8)        | 109 (17.3)       | 0.652   | 56 (12.6)       | 53 (28.2)            | <0.001  |
| Hospital mortality, (N-%) | 188 (29.7)         | 168 (31.1)       | 188 (29.8)       | 0.331   | NA              | NA                   | NA      |
| Vasopressin, (N-%) | 212 (33.4)         | 189 (35)         | 212 (33.6)       | 0.316   | 119 (26.7)      | 93 (49.5)            | <0.001  |

Abbreviation: APACHE Acute Physiology and Chronic Health Evaluation; SOFA Sepsis-related Organ Failure Assessment; SIRS Systemic Inflammatory Response Syndrome; qSOFA quick Sepsis-related Organ Failure Assessment; CRRT Continuous renal replacement therapy. Normal distributed data are expressed as mean ± standard deviation

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Table 2. Outcomes of univariate analysis for hospital mortality and ICU length of stay 3 days or more

| Variables                          | Hospital mortality | ICU length of stay ≥3 days | Odds ratio(95%CI) | P value | Odds ratio(95%CI) | P value |
|------------------------------------|--------------------|----------------------------|--------------------|---------|--------------------|---------|
| Age, years                         | 1.02 (1.01, 1.03)  | 1.00 (0.99, 1.01)          | 1.02 (1.01, 1.03)  | 0.01    | 1.00 (0.99, 1.01)  | 0.91    |
| Sex                                |                    |                            |                    |         |                    |         |
| Male                               | 1.0                | 1.0                        | 1.0                |         | 1.0                |         |
| Female                             | 0.79 (0.54, 1.13)  | 1.07 (0.77, 1.48)          | 0.79 (0.54, 1.13)  | 0.20    | 1.07 (0.77, 1.48)  | 0.71    |
| Hospital length of stay            | 0.98 (0.96, 0.99)  | 1.08 (1.06, 1.10)          | 0.98 (0.96, 0.99)  | 0.01    | 1.08 (1.06, 1.10)  | 0.01    |
| ICU length of stay                 | 0.99 (0.97, 1.00)  | –                          | –                  | 0.09    | –                  | –       |
| 28-days mechanical ventilation     | 1.03 (1.01, 1.05)  | 1.31 (1.26, 1.37)          | 1.03 (1.01, 1.05)  | 0.01    | 1.31 (1.26, 1.37)  | 0.01    |
| Mechanical ventilation, (N-%)      | 6.74 (2.37, 19.16) | 1.62 (0.94, 2.78)          | 6.74 (2.37, 19.16) | 0.01    | 1.62 (0.94, 2.78)  | 0.08    |
| Duration of CRRT                   | 0.99 (0.96, 1.02)  | 1.19 (1.07, 1.31)          | 0.99 (0.96, 1.02)  | 0.45    | 1.19 (1.07, 1.31)  | 0.01    |
| **CRRT (N-%)                       | 2.73 (1.79, 4.18)  | 1.77 (1.16, 2.71)          | 2.73 (1.79, 4.18)  | 0.01    | 1.77 (1.16, 2.71)  | 0.01    |
| SOFA                               | 1.22 (1.16, 1.28)  | 0.99 (0.95, 1.03)          | 1.22 (1.16, 1.28)  | 0.01    | 0.99 (0.95, 1.03)  | 0.51    |
| APACHE II                          | 1.14 (1.10, 1.17)  | 1.01 (0.99, 1.03)          | 1.14 (1.10, 1.17)  | 0.01    | 1.01 (0.99, 1.03)  | 0.48    |
| Vasopressors                       | 2.69 (1.89, 3.84)  | 0.78 (0.56, 1.09)          | 2.69 (1.89, 3.84)  | 0.01    | 0.78 (0.56, 1.09)  | 0.14    |
| SIRS                               | 1.13 (0.96, 1.33)  | 1.15 (0.98, 1.34)          | 1.13 (0.96, 1.33)  | 0.15    | 1.15 (0.98, 1.34)  | 0.09    |
| qSOFA                              | 1.58 (1.25, 1.99)  | 1.26 (1.02, 1.56)          | 1.58 (1.25, 1.99)  | 0.01    | 1.26 (1.02, 1.56)  | 0.03    |

Abbreviation: APACHE Acute Physiology and Chronic Health Evaluation; SOFA Sequential Organ Failure Assessment; SIRS Systemic Inflammatory Response Syndrome; qSOFA quick Sequential Organ Failure Assessment; CRRT Continuous renal replacement treatment.

Normal distributed data are expressed as mean ± standard deviation.
Table 3. Multivariate regression analysis of the risk of hospital mortality and ICU length of stay 3 days or more

| Independent variables | Non-adjusted | Adjusted I (age and sex) | Adjusted II (APACHE II) |
|-----------------------|--------------|--------------------------|-------------------------|
|                       | OR, 95%CI, p | OR, 95%CI, p             | OR, 95%CI, p            |
| Hospital mortality    |              |                          |                         |
| qSOFA                 | 1.58 (1.25, 1.99), <0.01 | 1.70 (1.34, 2.15), <0.01 | 1.17 (0.90, 1.53), 0.23 |
| SIRS                  | 1.13 (0.96, 1.33), 0.15 | 1.24 (1.04, 1.49), 0.02 | 1.00 (0.84, 1.20), 0.96 |
| SOFA                  | 1.22 (1.16, 1.28), <0.01 | 1.23 (1.17, 1.29), <0.01 | 1.12 (1.05, 1.19), <0.01 |
| ICU length of stay 3 days or more | | | |
| qSOFA                 | 1.26 (1.02, 1.56), 0.03 | 1.27 (1.03, 1.57), 0.03 | 1.27 (1.02, 1.58), 0.04 |
| SIRS                  | 1.15 (0.98, 1.34), 0.09 | 1.16 (0.99, 1.36), 0.07 | 1.14 (0.98, 1.33), 0.10 |
| SOFA                  | 0.99 (0.95, 1.03), 0.51 | 0.99 (0.95, 1.03), 0.53 | 0.97 (0.92, 1.02), 0.18 |

Abbreviation: APACHE Acute Physiology and Chronic Health Evaluation; SOFA Sequential Organ Failure Assessment; SIRS Systemic Inflammatory Response Syndrome; qSOFA quick Sequential Organ Failure Assessment

Figures

Figure 1

Distribution of hospital mortality in assessment systems
Figure 2

Area under the receiver operating characteristic curve and 95% confidence intervals for hospital mortality

Supplementary Files

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Supplemental Table.doc.docx
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