

四种评分系统对脓毒症患者ICU死亡风险的预测价值比较

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摘要:目的 评价序贯器官衰竭评分(SOFA)、简化急性生理评分(SAPS-II)、牛津急性疾病严重程度评分(OASIS)、Logistic器官功能障碍系统(LODS)评分系统预测ICU脓毒症患者死亡风险的价值。方法 通过MIMIC-III数据库提取2001年至2012年共计2470例脓毒症患者的临床资料,收集入ICU首日SOFA评分、SAPS-II评分、OASIS评分以及LODS评分。根据患者ICU存活情况分为存活组和死亡组,分析比较两组间不同评分系统的差异性,计算4种评分系统ROC曲线下面积进行差异性分析,对脓毒症患者ICU死亡情况进行二项Logistic回归分析,以综合比较4种评分系统对脓毒症患者ICU死亡的预测价值。结果 2470例脓毒症患者中ICU内存活1966例(79.6%),死亡504例(20.4%)。其中死亡组年龄、机械通气使用率、初始乳酸、肌酐、尿素氮、SOFA、SAPS-II、OASIS和LODS评分明显高于存活组($P<0.05$),体质量及血小板明显低于存活组($P<0.05$)。SOFA评分、SAPS-II评分、OASIS评分以及LODS评分的ROC曲线下AUC值分别为0.729($P<0.001$), 0.768($P<0.001$), 0.757($P<0.001$), 0.739($P<0.001$)。其中SAPS-II评分AUC值明显高于SOFA评分和LODS评分($Z=3.679, P<0.001$; $Z=3.698, P<0.001$), SAPS-II与OASIS评分无明显差异($Z=1.102, P=0.271$);OASIS评分明显高于LODS评分($Z=2.172, P=0.030$),但与SOFA评分无明显差异($Z=1.709, P=0.088$)。按照是否合并脓毒性休克将患者分为两组,在单纯脓毒症组中,SAPS-II评分预测患者死亡的AUC值明显高于其他3种评分,为0.769(0.743-0.793),在合并脓毒性休克组中,SAPS-II与OASIS评分预测患者死亡的AUC值明显高于其他两种评分,分别为0.768(0.745-0.791)、0.762(0.738-0.785)。二项Logistic回归多因素分析后发现SOFA、SAPS-II、OASIS评分系统均与脓毒症患者死亡相关(OR:1.08, 95% CI: 1.03-1.14, $P=0.001$; OR:1.04, 95% CI: 1.02-1.05, $P<0.001$; OR:1.04, 95% CI: 1.01-1.06, $P=0.001$),但LODS评分与脓毒症患者发生ICU死亡无明显关系(OR:0.96, 95% CI: 0.89-1.04, $P=0.350$)。结论 SOFA、SAPS-II和OASIS评分均能预测脓毒症患者ICU死亡风险,但SAPS-II评分和OASIS评分预测价值优于SOFA评分及LODS评分。

关键词:脓毒症;序贯器官衰竭评分;简化急性生理评分;牛津急性疾病严重程度评分;Logistic器官功能障碍系统

Comparison of four scoring systems for predicting ICU mortality in patients with sepsis

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Abstract: Objective To evaluate the value of Sequential Organ Failure Assessment (SOFA), Simplified Acute Physiology Score II (SAPS-II), Oxford Acute Severity of Illness Score (OASIS) and Logistic Organ Dysfunction System (LODS) scoring systems for predicting ICU mortality in patients with sepsis. **Methods** We collected the data of a total of 2470 cases of sepsis recorded in the MIMIC-III database from 2001 to 2012 and retrieved the scores of SOFA, SAPS-II, OASIS and LODS of the patients within the first day of ICU admission. We compared with the score between the survivors and the non-survivors and analyzed the differences in the area under the ROC curve (AUC) of the 4 scoring systems. Binomial logistic regression was performed to compare the predictive value of the 4 scoring systems for ICU mortality of the patients. **Results** In the 2470 patients with sepsis, 1966 (79.6%) survived and 504 (20.4%) died in the ICU. Compared with the survivors, the non-survivors had a significantly older mean age, higher proportion of patients receiving mechanical ventilation, and higher initial lactate level, creatinine, urea nitrogen, SOFA score, SAPS-II score, OASIS score and LODS score ($P<0.05$) but with significantly lower body weight and platelet counts ($P<0.05$). The AUCs of the SOFA score, SAPS-II score, OASIS score, and LODS score were 0.729 ($P<0.001$), 0.768 ($P<0.001$), 0.757 ($P<0.001$), and 0.739 ($P<0.001$), respectively. The AUC of SAPS-II score was significantly higher than those of SOFA score ($Z=3.679, P<0.001$) and LODS score ($Z=3.698, P<0.001$) but was comparable with that of OASIS score ($Z=1.102, P=0.271$); the AUC of OASIS score was significantly higher than that of LODS score ($Z=2.172, P=0.030$) and comparable with that of SOFA score ($Z=1.709, P=0.088$). For predicting ICU mortality in patients without septic shock, the AUC of SAPS-II score was 0.769 (0.743-0.793), the highest among the 4 scoring systems; in patients with septic shock, the AUCs SAPS-II score and OASIS score, 0.768 (0.745-0.791) and 0.762 (0.738-0.785), respectively, were significantly higher than those of the other two scoring systems. Binomial logistic regression showed the corrected SOFA, SAPS-II, and OASIS scores, but not LODS scores, were significantly correlated with ICU mortality in patients with sepsis, and their ORs were 1.08 (95% CI: 1.03-1.14, $P=0.001$), 1.04 (95% CI: 1.02-1.05, $P<0.001$), 1.04 (95% CI: 1.01-1.06, $P=0.001$), 0.96 (95% CI: 0.89-1.04, $P=0.350$), respectively.

Conclusion The scores of SOFA, SAPS-II, OASIS, and LODS can predict ICU mortality in patients with sepsis, but SAPS-II and OASIS scores have better predictive value than SOFA and LODS scores.

Keywords: sepsis; Sequential Organ Failure Assessment; Simplified Acute Physiology Score II; Oxford Acute Severity of Illness Score; Logistic Organ Dysfunction System

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脓毒症是重症患者发生死亡的主要原因之一,在2016年脓毒症国际会议上被定义为机体对感染的反应失调导致危及生命的器官功能不全^[1-2]。早期评估病情严重程度能有效降低脓毒症患者病死率。当前,有不少指标或评分系统可用于评估脓毒症患者预后^[3-6],但能精准评估脓毒症患者预后的则不多,常用的评分系统有序贯器官衰竭评分(SOFA)、简化急性生理评分(SAPS-Ⅱ)、牛津急性疾病严重程度评分(OASIS)、Logistic器官功能障碍系统(LODS)等。有研究显示^[7],相较于急性生理学与慢性健康状况评分系统Ⅱ(APACHEⅡ)评分、快速序贯器官衰竭评分(qSOFA)和全身炎症反应综合征(SIRS)评分,SOFA评分预测脓毒症预后效能最强,但受限于样本量不大。近年来,研究者构建出更为简单的OASIS评分,但在评估脓毒症患者预后方面是否强于传统的SAPS-Ⅱ评分、LODS评分,目前尚未得到证实。

MIMIC-Ⅲ (Medical Information Mart for Intensive Care Ⅲ)数据库^[8-9]是在美国国立卫生研究院的资助下,由美国麻省理工学院计算生理学实验室、贝斯以色列迪康医学中心以及飞利浦医疗共同发布的开放的重症医学数据库^[10],目前最新版本为MIMIC-Ⅲ v1.4^[11],该数据库收集了美国贝斯以色列迪康医学中心重症监护室2001年6月~2012年12月共计4万余真实患者住院信息^[12-13]。该数据库样本量大,可靠性高,本研究拟基于MIMIC-Ⅲ数据库比较SOFA、SAPS-Ⅱ、OASIS和LODS评分对脓毒症患者ICU死亡风险的预测价值。

1 资料和方法

1.1 研究对象

采用回顾性研究方法,提取MIMIC-Ⅲ数据库中所有脓毒症患者,其中符合要求的有2470例。

1.1.1 纳入标准 (1)鉴于该数据库仅存在出院诊断,要求纳入患者符合国际疾病分类编码(ICD-9)严重脓毒症(编码为99592)或脓毒性休克(编码为78552)诊断标准,且在入ICU±24 h期间已留血培养并已用抗生素治疗且最差SOFA评分≥2;(2)年龄≥18岁。

1.1.2 排除标准 (1)ICU住院时间<24 h;(2)多次入ICU患者;(3)心脏术后患者;(4)遗漏关键数据。

1.1.3 伦理学 MIMIC-Ⅲ数据库所有患者相关信息均为匿名,无需获得知情同意,且作者已通过Protecting Human Research Participants exam(No. 7849113)并获得该数据库下载及使用权。

1.2 观察指标及分组 基于MIMIC-Ⅲ数据库提取脓毒症患者基本信息:年龄,性别,体质量,是否机械通气,收集入ICU 24 h内脓毒症患者首次乳酸水平、白细胞、血红蛋白、血小板、肌酐和尿素氮等实验室检查以及最差SOFA评分、SAPS-Ⅱ评分、OASIS评分和LODS评分。根据ICU存活情况将患者分为存活组和死亡组。

1.3 统计学处理

采用PostgreSQL 10.7和Navicat Premium 11.0软件,运用SQL语言(Structure query language)从MIMIC-Ⅲ数据库中提取上述观察指标。采用Kolmogorov-Smirnov检验各连续变量正态性,呈正态分布的计量资料以均数±标准差表示,两组间比较采用独立样本 t 检验;呈非正态分布的计量资料以中位数和四分位数表示,两组间比较采用Mann-Whitney U 检验;计数资料采用 χ^2 检验进行比较。建立受试者工作特征(ROC)曲线分析比较4种评分系统对脓毒症患者ICU生存情况的预测价值。二项Logistic回归分析4种评分系统对脓毒症患者ICU死亡的影响,单因素分析结果 $P<0.1$ 纳入多因素分析。所有研究数据均使用SPSS 24.0软件分析,MedCalc 18.2作图,双侧 $P<0.05$ 为差异有统计学意义。

2 结果

2.1 两组患者基本资料比较(表1)

2470例脓毒症患者中ICU内存活1966例,死亡504例。其中存活组中年龄67.8(54.6~80.1)岁,男性1090例,体质量78.6(66.0~95.0)kg,机械通气865例;死亡组中年龄70.7(59.8~81.7)岁,男性264例,体质量76.3(62.9~92.2)kg,机械通气374例。死亡组年龄、机械通气占比、乳酸、肌酐、尿素氮、SOFA、SAPS-Ⅱ、OASIS和LODS评分明显高于存活组(均 $P<0.05$),体质量及血小板明显低于存活组($P<0.05$),而两组间性别、白细胞、血红蛋白之间的差异无统计学意义($P>0.05$),在各种合并症中,除了死亡组中心律不齐稍低($P=0.045$),其余合并症在两组中分布的差异无统计学意义($P>0.05$)。

2.2 4种评分系统评估脓毒症患者ICU死亡情况的ROC曲线及曲线下面积比较

建立ROC曲线评估4种评分系统对脓毒症患者ICU生存情况的预测,4种评分系统曲线下面积(AUC值)均>0.7,其中SOFA评分AUC值为0.729,95%可信区间(0.711,0.746);SAPS-Ⅱ评分AUC值为0.768,95%可信区间(0.751,0.785),OASIS评分AUC值为0.757,95%可信区间(0.740,0.774),LODS评分AUC值为0.739,95%可信区间(0.721,0.756)(图1)。选择4种评分系统Youden指数的最大截断点所对应界值作为预测患者死亡的诊断界点,即截断值(cut-off),其中SAPS-Ⅱ评分的敏感度最大,为78.17%,Youden指数也最大,为0.4181,而SOFA评分的特异度最大,为75.13%。将4种评分系统AUC值进行差异性分析(Z 检验),得出SAPS-Ⅱ评分AUC值较SOFA评分、LODS评分大,差异有统计学意义($Z=3.679, P<0.001; Z=3.698, P<0.001$),SAPS-Ⅱ评分AUC值较OASIS大,但差异无统计学意义($Z=1.102, P=0.271$);OASIS评分AUC值较LODS评分大,差异有统计学意义($Z=2.172, P=0.030$),与SOFA评

表1 脓毒症患者基线资料比较

Tab.1 Comparison of baseline characteristics between the survivors and non-survivors with sepsis

Characteristics	Total	Survival group	Death group	P
N (%)	2470 (100)	1966 (79.6)	504 (20.4)	-
Age (year)	68.4 (55.5-80.6)	67.8 (54.6-80.1)	70.71 (59.8-81.7)	<0.001
Male (%)	1354 (54.8)	1090 (55.4)	264 (52.4)	0.218
Weight (kg)	77.9 (65.7-94.4)	78.6 (66.0-95.0)	76.3 (62.9-92.2)	0.048
Ventilation (%)	1239 (50.2)	865 (44.0)	374 (74.2)	<0.001
Laboratory tests				
Lac (mmol/L)	2.0 (1.3-3.1)	1.8 (1.3-2.8)	2.6 (1.7-4.8)	<0.001
WBC ($\times 10^3/\mu\text{L}$)	13.1 (8.3-19.4)	13.0 (8.6-19.2)	13.3 (7.2-20.0)	0.842
HB (g/dL)	10.5 (9.3-11.9)	10.5 (9.3-11.9)	10.5 (9.3-12.0)	0.942
PLT ($\times 10^3/\mu\text{L}$)	192 (122-274)	196 (129-274)	173 (100-271)	0.001
CR (mg/dL)	1.3 (0.8-2.1)	1.2 (0.8-2.0)	1.6 (1.0-2.7)	<0.001
BUN (mg/dL)	28 (17-47)	26 (16-44)	37 (23-59)	<0.001
Comorbidity (%)				
Septicshock	1311 (53.1)	1036 (52.7)	275 (54.6)	0.454
Congestive heart failure	710 (28.7)	576 (29.3)	134 (26.6)	0.230
Cardiacarrhythmias	747 (30.2)	613 (31.2)	134 (26.6)	0.045
Pulmonarycirculation	137 (5.5)	111 (5.6)	26 (5.2)	0.670
Hypertension	338 (13.7)	272 (13.8)	66 (13.1)	0.666
Chronicpulmonary	478 (19.4)	372 (18.9)	106 (21.0)	0.285
Renal failure	431 (17.4)	351 (17.9)	80 (15.9)	0.296
Diabetes	773 (31.3)	628 (31.9)	145 (28.8)	0.171
Scores				
SOFA	7 (4-9)	6 (4-8)	9 (7-13)	<0.001
SAPS-II	44 (34-56)	41 (32-52)	57 (47-68)	<0.001
OASIS	38 (31-44)	36 (30-42)	44 (39-50)	<0.001
LODS	6 (4-8)	5 (3-7)	8 (6-10)	<0.001

Lac: Lactate; WBC: White blood cells; HB: Hemoglobin; PLT: Platelet; CR: Creatinine; BUN: Blood urea nitrogen; SOFA: Sequential organ failure assessment; SAPS-II: Simplified Acute Physiology Score II; OASIS: Oxford Acute Severity of Illness Score; LODS: Logistic Organ Dysfunction System.

分AUC值相比,差异无统计学意义($Z=1.709, P=0.088$); SOFA评分AUC值最小,与LODS评分相比,差异无统计学意义($Z=1.057, P=0.291$,表2)。

2.3 4种评分系统评估脓毒症与脓毒性休克患者ICU死亡情况的ROC曲线及曲线下面积比较

通过入ICU时患者是否合并脓毒性休克分为A、B两组(A组:不合并脓毒性休克,B组:合并脓毒性休克)。在A组患者中,SOFA评分、SAPS- II评分、OASIS评分、LODS评分预测ICU死亡的AUC值分别为0.741(0.714-0.766)、0.769(0.743-0.793)、0.752(0.726-0.777)、0.745(0.719-0.770),其中SAPS- II评分AUC值最大。在B组患者中,SOFA评分、SAPS- II评分、OASIS评分、LODS评分预测ICU死亡的AUC值分别为0.719(0.693-0.743)、0.768(0.745-0.791)、0.762(0.738-0.785)、0.734(0.709-0.758),其中SAPS- II评分与OASIS评分AUC值明显较SOFA评分和LODS评分大(图2)。

2.4 4种评分系统对所有脓毒症患者ICU死亡风险二项Logistic回归分析

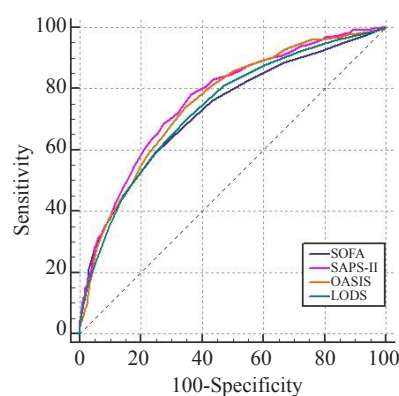


图1 4种评分系统预测脓毒症患者ICU死亡风险的ROC曲线

Fig.1 ROC curves of the 4 scoring systems for predicting ICU mortality in patients with sepsis.

校正前4种评分系统均是脓毒症患者ICU死亡的危险因素(均 $P<0.001$),将单因素回归有统计学意义的指标(年龄,机械通气,乳酸,肌酐,尿素氮,心律不齐以及SOFA、SAPS- II、OASIS、LODS评分)纳入多因素回

表2 4种评分系统ROC曲线下比较及差异性分析
Tab2 Comparison of the AUCs of the 4 scoring systems (Z test)

Score	Compare	SE	Z	P	95%CI
SOFA	vs SAPS-II	0.011	3.679	<0.001	0.019-0.061
	vs OASIS	0.013	2.172	0.030	0.003-0.055
	vs LODS	0.010	1.057	0.291	-0.009-0.029
SAPS-II	vs SOFA	0.011	3.679	<0.001	0.019-0.061
	vs OASIS	0.010	1.102	0.271	-0.008-0.030
	vs LODS	0.008	3.698	<0.001	0.014-0.045
OASIS	vs SOFA	0.013	2.172	0.030	0.003-0.055
	vs SAPS-II	0.010	1.102	0.271	-0.008-0.030
	vs LODS	0.011	1.709	0.088	-0.003-0.040
LODS	vs SOFA	0.010	1.057	0.291	-0.009-0.029
	vs SAPS-II	0.008	3.698	<0.001	0.014-0.045
	vs OASIS	0.011	1.709	0.088	-0.003-0.040

SOFA: Sequential organ failure assessment; SAPS-II: Simplified Acute Physiology Score II; OASIS: Oxford Acute Severity of Illness Score; LODS: Logistic Organ Dysfunction System; SE: Standard error; CI: Confidence interval.

归方程,发现有机通气、高乳酸、低肌酐、高尿素氮均是ICU患者发生死亡的独立危险因素;在4种评分中,SOFA、SAPS- II 、OASIS评分系统均是脓毒症患者ICU死亡的独立危险因素(OR: 1.08, 95%CI: 1.03-1.14, P=

0.001; OR: 1.04, 95%CI: 1.02-1.05, P<0.001; OR: 1.04, 95%CI: 1.01-1.06, P=0.001), 但LODS评分与脓毒症患者发生ICU死亡无明显关系(OR: 0.96, 95%CI: 0.89-1.04, P=0.350, 表3)。

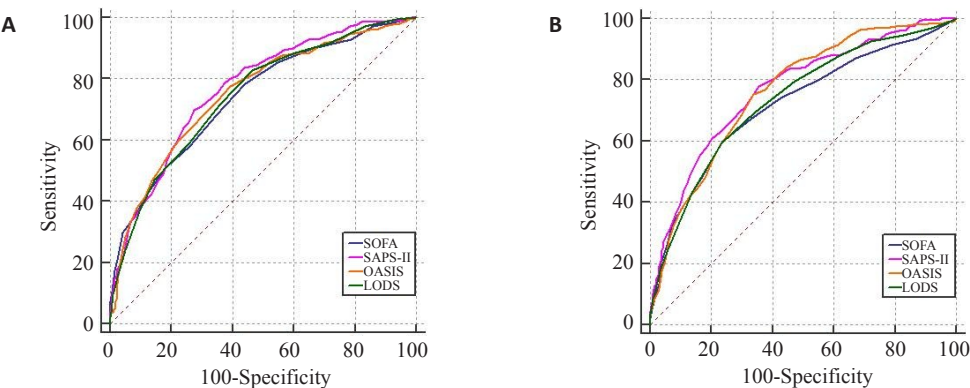


图2 4种评分系统预测是否合并脓毒性休克患者ICU死亡风险的ROC曲线
Fig.2 ROC curves of four scoring systems for predicting ICU mortality in patients with or without septic shock. A: Without septic shock; B: With septic shock; SOFA: Sequential organ failure assessment; SAPS-II: Simplified Acute Physiology Score II; OASIS: Oxford Acute Severity of Illness Score; LODS: Logistic Organ Dysfunction System; SE: Standard error; ROC: Receiver operator characteristic curve; CI: Confidence interval.

3 讨论

在ICU患者中,脓毒症发病率高,死亡率亦高达10%,若进一步发展成为脓毒性休克,则死亡率上升至40%^[1],近几年早期评估脓毒症患者病情严重程度及预测患者预后已成为重症医学的研究热点^[14-17]。

SOFA评分于2016年被列为脓毒症(sepsis 3.0)诊

断标准,作为目前临床最常用的重症评分系统,在多项大型回顾性研究中已被证明能有效评估脓毒症患者预后^[18-20]。SAPS- II 评分最初由Jean-Roger等^[21]提出,是目前临床上较常用的疾病严重程度评分系统,有研究证实,在预测脓毒症患者ICU死亡及住院死亡情况时可能优于SOFA评分^[22]。OASIS评分是由Johnson等^[23]在

表3 4种评分系统对所有脓毒症患者ICU死亡风险的二项Logistic回归分析

Tab.3 Binomial logistic regression analysis of the 4 scoring systems for ICU mortality in patients with sepsis

Variable	Univariable		Multivariable	
	OR (95%CI)	P	OR (95%CI)	P
Age (year)	1.01 (1.01-1.02)	<0.001	1.00 (0.99-1.01)	0.722
Male	0.88 (0.73-1.08)	0.218		
Weight	1.00 (0.99-1.00)	0.109		
Ventilation	3.66 (2.94-4.56)	<0.001	1.47 (1.07-2.04)	0.019
Lac	1.31 (1.25-1.38)	<0.001	1.14 (1.07-1.20)	<0.001
WBC	1.00 (1.00-1.01)	0.403		
HB	1.01 (0.97-1.06)	0.571		
PLT	1.00 (1.00-1.00)	0.106		
CR	1.13 (1.07-1.19)	<0.001	0.86 (0.77-0.96)	0.005
BUN	1.01 (1.01-1.02)	<0.001	1.01 (1.00-1.01)	0.012
Septicshock	1.08 (0.89-1.31)	0.454		
Congestive heart failure	0.87 (0.70-1.09)	0.230		
Cardiacarrhythmias	0.80 (0.64-1.00)	0.045	0.82 (0.63-1.07)	0.150
Pulmonarycirculation	0.91 (0.59-1.41)	0.670		
Hypertension	0.94 (0.70-1.25)	0.666		
Chronicpulmonary	1.14 (0.90-1.45)	0.285		
Renal failure	0.87 (0.67-1.13)	0.296		
Diabetes	0.86 (0.69-1.07)	0.171		
SOFA	1.25 (1.22-1.28)	<0.001	1.08 (1.03-1.14)	0.001
SAPS-II	1.07 (1.06-1.08)	<0.001	1.04 (1.02-1.05)	<0.001
OASIS	1.12 (1.10-1.13)	<0.001	1.04 (1.01-1.06)	0.001
LODS	1.33 (1.28-1.37)	<0.001	0.96 (0.89-1.04)	0.350

Lac: Lactate; WBC: White blood cell; HB: Hemoglobin; PLT: Platelet; CR: creatinine; BUN: Blood urea nitrogen; SOFA: Sequential organ failure assessment; SAPS-II: Simplified Acute Physiology Score II; OASIS: Oxford Acute Severity of Illness Score; LODS: Logistic Organ Dysfunction System; OR: Odd ratio; CI: Confidence interval.

2013年通过机器学习算法对APACHE II的参数进行分析构建得出,其包含了10项容易获得的基础参数(转入ICU前的住院时间、年龄、格拉斯哥昏迷评分、心率、平均动脉压、呼吸频率、体温、入ICU第一个24 h内的尿量、有无机械通气以及是否手术),多项研究表明其与重症患者预后相关^[24-25]。在预测ICU患者短期预后中,OASIS评分与SAPS II评分对成年ICU患者短期预后的预测价值相比无显著差异^[26],Chen等^[22]发现在脓毒症患者中,OASIS评分与SOFA评分对患者ICU死亡及住院死亡的差异亦无统计学意义。本研究则发现,在预测脓毒症患者ICU死亡情况中SOFA评分特异度最高,为75.13%,但敏感度最低,为59.13%,AUC值较SAPS-II评分及OASIS评分显著偏低,且在预测脓毒性休克患者发生死亡风险的能力明显低于预测单纯脓毒症患者(AUC值分别为0.719和0.741),这提示SOFA评分对脓毒症死亡风险评估能力不及SAPS-II评分及OASIS评分。

LODS评分纳入的每个变量都是经过Logistic回归筛选与计算权重,该系统得出的总分数与病情严重程度

密切相关^[27-28],有研究发现在预测脓毒症患者预后情况时,LODS评分与SOFA评分的差异无统计学意义^[29],但在评估病情更为严重的脓毒性休克患者预后时,LODS评分可能具有更好的预测价值^[30]。本研究则发现,LODS评分评估脓毒性休克患者死亡风险的能力并不强于单纯脓毒症(AUC值分别为0.734和0.745),而且在二项Logistic回归多因素分析后,发现LODS评分并不能影响脓毒症患者ICU死亡(OR:0.96,95%CI:0.89-1.04,P=0.350)。

本研究有一定的局限性,首先该研究纳入脓毒症患者均来源于美国贝斯以色列迪康医学中心重症监护室,属于单中心回顾性研究,主要对象为白色人种,其研究结果可能存在种族差异性,且该数据库收集2001~2012年重症监护室的患者相关信息,而脓毒症诊断与治疗在这段时期内变化明显。其次,在不同感染部位所致脓毒症患者中,各评分系统对预后的判断亦存在差异^[31],而本研究未能区分不同感染部位所致脓毒症患者。最后,我们未能分析各项评分系统的动态改变,而评分系统的动态改变更能直接反映脓毒症患者的预后。

综上所述,SOFA、SAPS- II 和 OASIS 评分均能预测脓毒症患者 ICU 死亡风险,但 SAPS- II 评分和 OASIS 评分预测价值优于 SOFA 评分及 LODS 评分。

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