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脓毒症患者血清炎症因子与SOFA评分的关系研究

梁鹏飞 李 曦 肖 敏 易显富 郭 辉

（湖北省十堰市太和医院急诊科 湖北 十堰 442000）

摘要 目的:探究脓毒症患者血清炎症因子与序贯器官衰竭评估(SOFA)评分的关系,从而有助于评价患者病情严重程度,科学判断预后效果。**方法:**选择2014年1月至2015年12月期间在本院内接受治疗的脓毒血症患者142例作为研究对象。入院后24 h内患者进行血清炎症因子IL-6、PCT、CRP水平测定,同时进行SOFA评分。按照患者在入院治疗28天内生存结局状况进行分组,分别为死亡组(87例)和存活组(55例),另按照患者合并多器官功能障碍综合症(MODS)与否,分为MODS组(76例)和非MODS组(66例),对比不同组别间IL-6、PCT、CRP及SOFA评分差别;对比不同SOFA评分患者血清IL-6、PCT、CRP水平差异,分析其相关性。**结果:**IL-6、PCT以及SOFA评分比较,死亡组高于存活组,MODS组高于非MODS组,差异有统计学意义(P<0.05);SOFA评分越高,血清IL-6、PCT水平越高,差异有统计学意义(P<0.05);SOFA评分升高,患者病死率显著增加,SOFA>10分,病死率为78.3%,差异有统计学意义(P<0.05);Spearman相关分析结果显示,SOFA评分与血清IL-6水平呈显著正相关关系(r=0.261,P=0.012),与血清PCT水平呈正相关关系(r=0.453,P=0.000),SOFA与CRP水平无相关性(r=0.112,P=0.323)。**结论:**血清IL-6、PCT水平与SOFA评分具有相关性,可以在脓毒症患者病情严重程度及预后状况判断中作为生物学指标进行常规监测。

关键词:脓毒症;IL-6;PCT;CRP;SOFA评分

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Study on the Relationship Between Serum Inflammatory Factors and SOFA in Patients with Sepsis

LIANG Peng-fei, LI Xi, XIAO Min, YI Xian-fu, GUO Hui

(Department of Emergency, Shiyan Taihe Hospital of Hubei Province, Shiyan, Hubei, 442000, China)

ABSTRACT Objective: To explore the relationship between serum inflammatory factors and sequential organ failure assessment (SOFA) in patients with sepsis, which help to evaluate the severity of the disease, scientific judgment prognosis. **Methods:** From January 2014 to December 2015,142 cases for treatment of sepsis in our hospital were included as the research objects. Within 24h after admission,patients were detected serum inflammatory factors, such as IL-6, PCT, CRP, so as SOFA. According to the patients in the hospital treatment group survival outcomes in 28 d, respectively, the death group (87 cases) and survival group (55 cases), and according to the patients whether with MODS was divided into MODS group (76 cases) and non MODS group (66 cases). Compare the differences of IL-6, PCT, CRP and SOFA scores between different groups, and compare the serum levels of, PCT and in patients with different SOFA scores, and analyze the correlation. **Results:** In comparison with IL-6, PCT and SOFA scores, the death group was higher than the survival group, the MODS group was higher than the non MODS group, the difference was statistically significant (P<0.05). The higher the SOFA score, serum IL-6, PCT level was higher, the difference was statistically significant (P<0.05); the SOFA score increased, the mortality rate was significantly increased, SOFA>10, the fatality rate was 78.3%, the difference was statistically significant (P<0.05); Spearman correlation analysis showed that SOFA score was positively correlated with serum IL-6 levels (r=0.261, P=0.012), was positively correlated with serum PCT level(r=0.453, P=0.000), there is no correlation between SOFA and CRP levels (r=0.112, P=0.323). **Conclusion:** Serum IL-6, PCT levels have a correlation with SOFA, and can be used as biological indicators in judging the severity of patients with sepsis and prognosis in routine monitoring.

Key words: Sepsis; IL-6; PCT; CRP; SOFA score

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前言

脓毒症(sepsis)是感染导致全身性炎症反应的一类综合征,发病急,进展快,病死率高,常伴有多器官功能障碍(multiple organ dysfunction syndrome , MODS),是病情危重者的常见死因。相关研究结果表明[1],白细胞介素-6(interleukin- 6, IL-6)能够在免疫系统功能调节中发挥重要作用,能够反映脓毒症危重程度。降钙素原(procalcitonin, PCT)是降钙素的一种前体蛋白,敏感性高,机体感染严重程度及临床预后效果与PCT水平存在密切关系[2]。机体出现炎症反应时,C-反应蛋白(C-reaction

作者简介:梁鹏飞(1982-),男,住院医师,硕士,研究方向:重症医学,E-mail:47752000@qq.com

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protein, CRP)显著增加,可作为感染严重程度的生物学指标[3]。序贯器官衰竭评估评分 (Sequential Organ Failure Assessment , SOFA)则是一种简单便捷的标准评分法[4],在对危重病患者的预后评价中发挥重要作用，但在以往研究中，将炎症因子与SOFA 进行综合分析的报道较少。因此,本次研究主要分析脓毒症患者血清炎症因子 IL-6、PCT、CRP 水平，同时探究 SOFA 评分与炎症因子相关性，从而有助于判断患者病情严重情况，分析预后效果,现将本次研究报道如下。

1 对象与方法

1.1 研究对象

选择 2014 年 1 月至 2015 年 12 月期间在本院内接受治疗的脓毒血症患者 142 例作为研究对象,均符合脓毒血症诊断标准[5]。排除标准:并恶性肿瘤或是血液疾病;患者存在甲状腺功能异常、慢性肝肾疾病终末期、心肌梗塞等疾病;患者妊娠、年龄低于 14 岁者[6]。其中男性患者 83 例,女性患者 59 例,年龄范围 32-78 岁,平均年龄(68.7± 8.36)岁;并发肺炎者 47 例,并发多发伤患者 36 例,并发胆道感染者 31 例,并发急性颅脑损伤者 16 例,尿路感染者 7 例,其他 5 例。按照患者在入院治疗 28 天内生存结局状况进行分组,分别为死亡组(87 例)和存活组(55 例),另按照患者合并 MODS 与否,分为 MODS 组(76 例)和非 MODS 组(66 例)。本次研究经医院伦理委员会批准,患者及家属均知情同意,并签署知情同意书。

1.2 指标及方法

(1)确诊为脓毒症后入院接受治疗,并于次日清晨空腹抽取肘正中静脉血进行 IL-6、PCT 及 CRP 等指标检测;(2) 确诊后 24 h 内进行 SOFA 评分;(3)患者确诊后进行规范化治疗,对治疗期间患者各指标状况及 28 天预后结果进行观察、记录[7]。

1.3 统计学方法

采用 SPSS18.0 处理,计量资料,若符合正态分布,采用均数± 标准差形式表示,独立资料 t 检验;若不符合正态分布,采用中位数或四分位数间距[M(QR)]形式表示,Mann-whitney 秩和检验,多组间比较采用 Kruskal-wallis 秩和检验。计数资料采用 x^2 检验，相关分析采用 Spearman 分析,P<0.05 为差异有统计学意义。

2 结果

2.1 存活组与死亡组血清炎性指标和 SOFA 评分比较

存活组和死亡组患者性别、年龄、CRP 水平差异无统计学差异(P>0.05),IL-6、PCT、SOFA 评分比较,死亡组患者高于存活组患者,差异有统计学意义(P<0.05),见表 1。

表 1 存活组与死亡组血清炎性指标和 SOFA 评分比较

Table 1 Comparison of serum inflammatory index and SOFA scores between the survival group and the death group

Groups	Cases	Male/Female	Age(years)	IL-6[M(QR), ng/L]	PCT[M(QR), μg/L]	CRP[M(QR), mg/L]	SOFA[M(QR)]
Survival group	87	53/34	67.2± 4.38	114.8(191.3)	5.9(22.6)	100.7(132.7)	6
Death group	55	30/25	66.9± 5.12	192.2(168.4)	35.6(85.4)	118.6(115.6)	12
x^2/t/Z		0.564	0.372	1.465	-3.678	-0.671	-7.231
P		0.453	0.710	0.031	0.001	0.487	0.000

2.2 MODS 组与非 MODS 组患者血清炎性指标、SOFA 评分对比

MODS 组与非 MODS 组患者在年龄、性别、CRP 等方面差异资料无统计学意义 (P>0.05),IL-6、PCT 以及 SOFA 评分比较,MODS 组患者高于非 MODS 组患者，差异有统计学意义(P<0.05),见表 2。

表 2 MODS 组与非 MODS 组患者血清炎性指标和 SOFA 评分比较

Table 2 Comparison of serum inflammatory index and SOFA scores between the MODS and no-MODS group

Groups	Cases	Male/Female	Age(years)	IL-6[M(QR), ng/L]	PCT[M(QR), μg/L]	CRP[M(QR), mg/L]	SOFA[M(QR)]
MODS group	76	47/29	67.6± 5.43	194.7(181.5)	29.8(87.1)	116.8(1117.8)	15
no-MODS group	66	36/30	68.7± 4.35	92.3(154.6)	4.7(17.4)	91.6(132.6)	6
x^2/t/Z		0.526	-1.318	-2.476	-4.165	-0.766	-8.456
P		0.577	0.189	0.024	0.000	0.498	0.000

2.3 不同 SOFA 评分患者血清炎性因子水平对比

SOFA 评分越高,血清 IL-6、PCT 水平越高,差异有统计学意义(P<0.05);SOFA 评分升高,患者病死率显著增加,SOFA 大于 10 分,病死率为 78.3%,差异有统计学意义(P<0.05),见表 3。将 SOFA 评分与血清炎性因子进行 Spearman 相关分析，结果表明 SOFA 评分与血清 IL-6 水平呈显著正相关关系(r=0.261,P=0.012)，与血清 PCT 水平呈正相关关系(r=0.453,P=0.000),SOFA 与 CRP 水平无相关性(r=0.112,P=0.323)。

3 讨论

脓毒症病理过程较为复杂,往往伴有免疫反应,包括感染、炎症反应等。现在研究结果表明机体内促炎 / 抗炎平衡与脓毒症存在密切关系[8]。多种因素共同作用下,导致机体内产生抗炎反应、促炎反应,各细胞因子相互作用,从而发生瀑布样反应,

表 3 不同 SOFA 评分患者血清炎性因子水平对比

Table 3 Comparison of serum inflammatory index among different SOFA scores

Different SOFA scores	Cases	IL-6[M(QR), ng/L]	PCT[M(QR), μg/L]	CRP[M(QR),mg/L]	Case fatality rate(%)
Interval 1 (1-5 scores)	32	66.7(134.2)	2.4(16.4)	57.7(136.7)	0(0.00)
Interval 2 (6-10 scores)	41	129.4(242.1)	6.6(21.3)	109.1(166.8)	3(11.2)
Interval 3(>10 scores)	69	179.8(181.3)	27.3(85.6)	118.7(117.9)	36(78.3)
x^2		6.821	18.614	2.421	52.123
P		0.026	0.000	0.304	0.000

进展为 MODS。在正常成人机体内,IL-6 处在较低水平(<10 pg/mL),若个体伴随创伤、感染等,则会伴随出现 IL-6 水平显著增加,促进炎性反应,破坏各器官功能[8]。有研究表明[9]IL-6 能作为独立危险因素判断脓毒症患者病死率。相关报道称[10]临床上脓毒症早期诊断生物学指标主要包括 CRP、PCT, 能够用于临床上判断细菌感染,可靠性较高。相关研究结果表明[11],在对脓毒症严重程度的判断中,PCT 作为判断指标的特异性、敏感性及预后判断中均显著高于 CRP。SOFA 评分可以评价危重症患者器官功能障碍程度,同时可以对疾病演变过程进行动态观察[12]。相关研究结果表明[13]对脓毒症患者进行 SOFA 评分能够有效预测预后状况。以往研究报道称[14]对脓毒症患者 3 种血清炎症分子水平进行检测,可以用于诊断和判断预后效果,但 SOFA 评分与血清炎性分子相关性研究较少。本研究结果表明 SOFA 评分与三种血清炎性因子进行相关性分析,为临床提供科学依据。

本次研究结果表明对脓毒症患者进行 SOFA 评分,血清炎症因子水平与评分进行相关性研究,结果表明 SOFA 评分与血清 IL-6、PCT 水平存在显著正相关关系, 且随评分增加其水平也随之提高, 结果表明脓毒症越严重, 血清 IL-6、PCT 水平越高;进一步分析发现 SOFA 评分与 PCT 相关性更高,分析原因可能是机体内血清 IL-6 半衰期短,时效性较差,导致其作为脓毒症的生物标志物的效果较差[14-16]。在对不同 SOFA 评分段进行对比分析结果显示, 不同 SOFA 评分患者血清 CRP 水平差异无统计学意义(P＞0.05),SOFA 评分与血清 CRP 水平间无显著相关性(P＞0.05),可能是由于患者患病早期内血清 CRP 水平即达到较高水平,在病情进展期内变化并不显著,因此,SOFA 评分与 CRP 水平与未显示相关性,特异性不高,无法用于评价病情严重程度[16-19]。本次研究结果显示,在血清 IL-6、PCT 水平比较中,死亡组、MODS 组患高于存活组、非 MODS 组,差异均有统计学意义(P<0.05),组间血清 CRP 水平无统计学差异(P>0.05),结果表明,随着血清 IL-6、PCT 水平的升高,MODS 发生率、脓毒症病死率显著增加,表明血清 IL-6、PCT 水平与脓毒症严重程度、预后结果存在一定相关性;因此,血清 IL-6、PCT 水平可作为判断脓毒症患者病情严重程度及预后效果的生物学指标。

综上所述,脓毒症发病急、进展迅速、预后效果较差,因此在对病情诊断和治疗过程中需要全面了解病情严重程度,从而可以做出准确判断。本次研究结果表明 IL-6、PCT、SOFA 评分等指标间存在相关性,可以作为脓毒症病情严重程度和预后判断的重要指标。本研究不足之处在于:(1)作为单中心研究,病例数量较少;(2)本研究选取的临床指标仅包含入院 24h 内的各项数据,数据的动态变化未进行观察、分析;(3)本次研究随访时间短。因此,需要进一步扩大研究样本量进行深入探究。

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