·临床研究·

高龄社区获得性肺炎患者血清可溶性尿激酶型纤溶酶原激活物受体、正五聚蛋白3、中性粒细胞与淋巴细胞比值检测及与病情严重程度及预后的相关性

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【摘 要】 目的 探讨血清可溶性尿激酶型纤溶酶原激活物受体(suPAR)、正五聚蛋白3(PTX3)及中性粒细胞与淋巴细胞比值(NLR)水平检测在反映高龄社区获得性肺炎(CAP)患者病情严重程度及预后中的意义。**方法** 选择上海中医药大学附属曙光医院2021年6月至2022年6月收治的146例高龄CAP患者为研究对象,检测并比较重症CAP患者(重症CAP组,$n=50$)及非重症CAP患者(非重症CAP组,$n=96$)入院时血清suPAR、PTX3及NLR水平,死亡组($n=12$)与存活组($n=134$)患者血清suPAR、PTX3、NLR、英国胸科协会改良肺炎(CURB-65)评分及PSI评分情况。采用SPSS 19.0统计软件进行数据分析。根据数据类型,分别采用t检验、Mann-Whitney U检验或χ^2检验进行组间比较。采用Pearson线性相关分析法分析高龄CAP患者血清suPAR、PTX3、NLR水平与CURB-65评分、肺炎严重指数(PSI)评分、C-反应蛋白(CRP)及降钙素原(PCT)水平的相关性。采用多因素logistic回归分析高龄CAP患者病情严重程度的影响因素。绘制受试者工作特征(ROC)曲线,评价各指标在预测高龄CAP患者不良预后中的效能。**结果** 重症CAP组与非重症CAP组患者白细胞计数(WBC)[(10.43±2.16)×10^9/L和(7.65±1.83)×10^9/L]、CRP[(84.63±15.37)mg/L和(41.74±10.25)mg/L]、PCT[(0.53±0.15)μg/L和(0.12±0.02)μg/L]、中性粒细胞比率[(84.15±18.65)%和(73.15±14.69)%]、淋巴细胞比率[(8.44±2.15)%和(15.74±2.36)%]、NLR[(9.97±1.86)和(4.65±1.19)]、血清suPAR[(5.31±1.16)ng/mL和(2.38±0.36)ng/mL]、PTX3[(12.34±2.73)ng/mL和(6.41±1.57)ng/mL]及CURB-65评分[(2.13±0.75)分和(1.36±0.21)分]、PSI评分[(93.47±25.37)分和(60.43±19.42)分]比较,差异均有统计学意义($P<0.05$)。Pearson相关性分析提示,血清suPAR、PTX3及NLR均与CURB-65($r=0.396$,0.281,0.325;$P<0.05$)及PSI评分($r=0.279$,0.276,0.246;$P<0.05$)呈正相关;血清suPAR及NLR与CRP水平呈正相关($r=0.349$,0.306;$P<0.05$);血清PTX3与PCT水平呈正相关($r=0.321$;$P<0.05$)。多因素logistic回归分析提示,NLR(*OR*=1.551,95%*CI* 1.188~2.025)、suPAR(*OR*=1.765,95%*CI* 1.223~2.546)及PTX3(*OR*=1.964,95%*CI* 1.159~3.328)是高龄CAP患者病情严重程度的影响因素。共12例(8.22%)患者30 d内病死,死亡组患者血清suPAR、PTX3、NLR、CURB-65评分及PSI评分均高于存活组,差异有统计学意义($P<0.05$)。绘制ROC曲线发现血清suPAR(AUC=0.809,95%*CI* 0.719~0.899)、PTX3(AUC=0.788,95%*CI* 0.631~0.905)、NLR(AUC=0.836,95%*CI* 0.727~0.945)及PSI(AUC=0.714,95%*CI* 0.619~0.849)在预测CAP患者死亡中均具有一定价值,且血清suPAR、PTX3及NLR在预测CAP患者死亡中的效能高于CURB-65及PSI评分。**结论** 血清suPAR、PTX3及NLR在反映高龄CAP患者病情严重程度及预后中具有一定价值。

【关键词】 老年人;社区获得性肺炎;血清可溶性尿激酶型纤溶酶原激活物受体;正五聚蛋白3;中性粒细胞与淋巴细胞比值
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Levels of serum soluble urokinase-type plasminogen activator receptor, pentraxin 3 and neutrophil-to-lymphocyte ratio and their correlation with disease severity and prognosis in elderly patients with community-acquired pneumonia

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【Abstract】 Objective To explore the significance of serum soluble urokinase-type plasminogen activator receptor (suPAR), pentraxin 3 (PTX3) and neutrophil-to-lymphocyte ratio (NLR) in reflecting the disease severity and prognosis in the elderly patients with community-acquired pneumonia (CAP). **Methods** A total of 146 elderly CAP patients admitted to Shuguang Hospital Affiliated to Shanghai University of Traditional Chinese Medicine from June 2021 to June 2022 were included as the study subjects. Serum

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suPAR, PTX3 and NLR levels on admission were measured and compared between severe CAP patients (severs CAP group, $n=50$) and non-severe CAP patients (non-severe CAP group, $n=96$). Serum suPAR, PTX3, NLR, CURB-65 score and PSI score were compared between death group ($n=12$) and survival group ($n=134$). Data analysis was performed with SPSS statistics 19.0. According to the data types, t test, Mann-Whitney U test or *Chi*-square test was used for between-group comparison. Pearson linear correlation analysis was used to analyze the correlation between serum suPAR, PTX3, NLR levels and CURB-65 score, pneumonia severity index (PSI) score, C-reactive protein (CRP) and procalcitonin (PCT) in the elderly CAP patients. Multivariate logistic regression analysis was used to analyze the factors affecting disease severity in them, and receiver operating characteristic (ROC) curve was drawn to evaluate the efficiency of each indicator on predicting poor prognosis in them. **Results** There were statistically significant differences between severe CAP group and non-severe CAP group ($P<0.05$) in white blood cell (WBC) [$(10.43\pm2.16)\times10^9$/L *vs* $(7.65\pm1.83)\times10^9$/L], CRP [(84.63±15.37) mg/L *vs* (41.74±10.25) mg/L], PCT [(0.53±0.15) μg/L *vs* (0.12±0.02) μg/L], neutrophil ratio [(84.15±18.65)% *vs* (73.15±14.69)%], lymphocyte ratio [(8.44±2.15)% *vs* (15.74±2.36)%], NLR [(9.97±1.86) *vs* (4.65±1.19)], serum suPAR [(5.31±1.16) ng/ml *vs* (2.38±0.36) ng/ml], PTX3 [(12.34±2.73) ng/ml *vs* (6.41±1.57) ng/ml], CURB-65 score [(2.13±0.75) *vs* (1.36±0.21)] and PSI score [(93.47±25.37) *vs* (60.43±19.42)]. Pearson correlation analysis showed that serum suPAR, PTX3 and NLR were positively correlated with CURB-65 score ($r=0.396$, 0.281, 0.325; $P<0.05$) and PSI score ($r=0.279$, 0.276, 0.246; $P<0.05$). Serum suPAR and NLR were positively correlated with CRP level ($r=0.349$, 0.306; $P<0.05$). Serum PTX3 was positively correlated with PCT level ($r=0.321$; $P<0.05$). Multivariate logistic regression analysis suggested that NLR (*OR*=1.551, 95%*CI* 1.188-2.025), suPAR (*OR*=1.765, 95%*CI* 1.223-2.546) and PTX3 (*OR*=1.964, 95%*CI* 1.159-3.328) were factors affecting disease severity in the elderly CAP patients. Totally, 12 patients (8.22%) died within 30 d. Serum suPAR, PTX3, NLR, CURB-65 score and PSI score in death group were higher than those in survival group, the differences were statistical significance ($P<0.05$). ROC curve showed that serum suPAR (AUC=0.809, 95%*CI* 0.719-0.899), PTX3 (AUC=0.788, 95%*CI* 0.631-0.905), NLR (AUC=0.836, 95%*CI* 0.727-0.945) and PSI (AUC=0.714, 95%*CI* 0.619-0.849) were of some value in predicting death in CAP patients, and the predicting efficiency of serum suPAR, PTX3 and NLR was higher than that of CURB-65 score and PSI score. **Conclusion** Serum suPAR, PTX3 and NLR have certain value in reflecting the disease severity and prognosis in the elderly CAP patients.

【Key words】 aged; community-acquired pneumonia; serum soluble urokinase-type plasminogen activator receptor; pentraxin 3; neutrophil-to-lymphocyte ratio

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社区获得性肺炎(community-acquired pneumonia, CAP)病情及预后的判断极为重要,临床广泛应用的英国胸科协会改良肺炎(confusion, uremia, respiratory, blood pressure, age ≥65 years, CURB-65)评分特异度高,操作简单,但灵敏度低,而肺炎严重指数(pneumonia severity index, PSI)涉及的指标多,评估繁琐[1],寻找便捷、有效的评估指标是当前研究的热点。有研究发现,血清可溶型尿激酶性纤溶酶原激活物受体(soluble urokinase-type plasminogen activator receptor, suPAR)、正五聚蛋白 3(pentraxin 3, PTX3)、中性粒细胞与淋巴细胞比值(neutrophil-to-lymphocyte ratio, NLR)在评估 CAP 病情及预后中具有一定价值[2-4]。但其多应用于儿童、中青年及年轻老年 CAP 患者的病情评估,较少应用于高龄 CAP 患者中,因此,本研究对以上新型血清指标在高龄 CAP 患者中的应用价值进行探讨。

1 对象与方法

1.1 研究对象

选择上海中医药大学附属曙光医院 2021 年 6 月至 2022 年 6 月收治的 146 例高龄 CAP 患者为研究对象。根据患者 CAP 病情严重程度,将其分为重症 CAP 组($n=50$)与非重症 CAP 组($n=96$)。统计患者 30 d 内病死情况,并根据 30 d 内病死情况将其分为死亡组($n=12$)与存活组($n=134$)。纳入标准:(1)年龄≥80 岁;(2)符合中华医学会呼吸病学分会制定的《中国成人社区获得性肺炎诊断与治疗指南》中 CAP 诊断标准[5]。排除标准:(1)合并实体肿瘤、血液系统疾病及免疫缺陷性疾病;(2)合并其他部位感染;(3)入院时应用抗生素超过 72 h。

CAP 诊断标准为符合(1)、(3)且符合(2)中任意一项,并排除肺结核、肺部肿瘤等后即可确诊。(1)社区发病;(2)肺炎相关临床表现:发热;肺实变体征和(或)闻及湿性啰音;白细胞计数(white blood cell, WBC)>10×10^9/L 或<4×10^9/L;(3)胸部影像学检查提示新出现的斑片状浸润影、叶或段实变影、磨玻璃影或间质性改变,伴或不伴胸腔积液。

重症 CAP 诊断标准为符合以下一个主要指标或至少 3 个次要指标。主要指标包括:(1)需接受机械通气;(2)脓毒症休克经体液复苏后依旧需要血管活性药物治疗。次要指标包括:(1)多叶浸润;(2)氧合指数<250 mmHg(1 mmHg=0.133 kPa);(3)呼吸频率≥30 次/min;(4)意识障碍或定向障碍;(5)血尿素氮≥7.14 mmol/L;(6)收缩压<90 mmHg,需体液复苏。

1.2 方法

1.2.1 血清 suPAR、PTX3 及 NLR 水平检测 患者入院后 24 h 内采集外周静脉血 6 ml，3000 r/min 离心 15 min，留取上层血清，定量酶联免疫吸附法检测血清 suPAR 及 PTX3 水平，试剂盒均购自美国 R&D 公司。检测中性粒细胞计数与淋巴细胞计数，计算 NLR。

1.2.2 临床指标收集 收集患者性别、年龄、不良生活习惯、基础性疾病、病原学检查（痰培养结果）、胸片检查结果、入院时 CURB-65 评分[6]、PSI 评分[7]等临床资料，降钙素原（procalcitonin，PCT）、C-反应蛋白（C-reactive protein，CRP）、血小板计数等实验室指标。

1.3 统计学处理

采用 SPSS 19.0 统计软件进行数据分析。符合正态分布的计量资料以均数±标准差（$\bar{x}\pm s$）表示，组间比较采用 t 检验。计数资料以例数（百分率）表示，组间比较采用 χ^2 检验。采用 Pearson 线性相关分析法分析高龄 CAP 患者血清 suPAR、PTX3、NLR 水平与 CURB-65 评分、PSI 评分、CRP 及 PCT 的相关性。采用多因素 logistic 回归分析高龄 CAP 患者病情严重程度的影响因素。绘制受试者工作特征（receiver operating characteristic，ROC）曲线，评价各指标在预测高龄 CAP 患者 30 d 死亡中的效能。$P<0.05$ 为差异有统计学意义。

2 结 果

146 例高龄 CAP 患者年龄 80～97 岁；男性 97 例，女性 49 例；痰培养结果阳性者 48 例；所有患者均采集痰液送检，培养共鉴定出致病菌 98 株，其中革兰阳性菌 33 株（33.67%），分别为金黄色葡萄球菌 18 株，肺炎链球菌 15 株；革兰阴性菌 65 株（66.33%），分别为肺炎克雷伯菌 25 株，铜绿假单胞菌 20 株，大肠埃希菌 20 株。药敏试验提示革兰阴性菌对左氧氟沙星、头孢吡肟、阿米卡星及哌拉西林他唑巴坦的耐药率较低，对头孢唑林、头孢曲松的耐药率较高；革兰阳性菌对呋喃妥因、万古霉素及复方新诺明的耐药率较低，对妥布霉素、庆大霉素的耐药率较高。

2.1 重症 CAP 组与非重症 CAP 组患者基线资料比较

重症组 CAP 患者与非重症 CAP 患者 WBC、CRP、PCT、中性粒细胞比率、淋巴细胞比率、NLR、血清 suPAR、PTX3 及 CURB-65、PSI 评分比较，差异均有统计学意义（$P<0.05$；表 1）。

表 1 重症 CAP 组与非重症 CAP 组患者基线资料比较

Table 1 Comparison of baseline data between severe CAP group and non-severe CAP group

Item	Severe CAP group ($n=50$)	Non-severe CAP group ($n=96$)	t/χ^2	P value
Age (years, $\bar{x}\pm s$)	85.56±4.15	84.51±4.05	1.474	0.143
Gender [n (%)]			0.203	0.653
Male	32 (64.00)	65 (67.71)		
Female	18 (36.00)	31 (32.29)		
Smoking [n (%)]	21 (42.00)	38 (39.58)	0.080	0.778
Alcohol drinking [n (%)]	12 (24.00)	22 (22.92)	0.022	0.883
Underlying disease [n (%)]				
Diabetes mellitus	10 (20.00)	21 (21.88)	0.069	0.793
Hypertension	16 (32.00)	29 (30.21)	0.050	0.824
Coronary heart disease	12 (24.00)	20 (20.83)	0.193	0.661
Chronic obstructive pulmonary disease	5 (10.00)	11 (11.46)	0.083	0.773
Cerebrovascular disease	3 (4.00)	6 (6.25)	0.004	0.952
Positive etiological examination [n (%)]	15 (30.00)	33 (34.38)	0.285	0.593
Chest X-ray examination [n (%)]				
Bilateral lung infection	10 (20.00)	20 (20.83)	0.014	0.906
Pleural effusion	4 (8.00)	13 (13.54)	0.834	0.361
WBC ($\times10^9$/L, $\bar{x}\pm s$)	10.43±2.16	7.65±1.83	8.180	<0.001
CRP (mg/L, $\bar{x}\pm s$)	84.63±15.37	41.74±10.25	20.100	<0.001
PCT (μg/L, $\bar{x}\pm s$)	0.53±0.15	0.12±0.02	26.416	<0.001
Platelet count ($\times10^9$/L, $\bar{x}\pm s$)	243.15±53.69	244.74±61.17	0.155	0.877
Neutrophil ratio (%, $\bar{x}\pm s$)	84.15±18.65	73.15±14.69	3.906	<0.001
Lymphocyte ratio (%, $\bar{x}\pm s$)	8.44±2.15	15.74±2.36	18.273	<0.001
NLR ($\bar{x}\pm s$)	9.97±1.86	4.65±1.19	20.993	<0.001
Serum suPAR (ng/mL, $\bar{x}\pm s$)	5.31±1.16	2.38±0.36	22.791	<0.001
Serum PTX3 (ng/mL, $\bar{x}\pm s$)	12.34±2.73	6.41±1.57	16.666	<0.001
CURB-65 (points, $\bar{x}\pm s$)	2.13±0.75	1.36±0.21	9.402	<0.001
PSI (points, $\bar{x}\pm s$)	93.47±25.37	60.43±19.42	8.759	<0.001

CAP: community-acquired pneumonia; WBC: white blood cell; CRP: C-reactive protein; PCT: procalcitonin; NLR: neutrophil-to-lymphocyte ratio; suPAR: soluble urokinase-type plasminogen activator receptor; PTX3: pentraxin 3; CURB-65: confusion, uremia, respiratory, blood pressure, age ≥65 years; PSI: pneumonia severity index.

2.2 高龄 CAP 患者血清 suPAR、PTX3 及 NLR 水平与疾病严重程度的相关性

Pearson 相关性分析提示，血清 suPAR、PTX3 及 NLR 与 CURB-65 及 PSI 评分均呈正相关（$P<0.05$）；血清 suPAR 及 NLR 与 CRP 水平呈正相关（$P<0.05$）；血清 PTX3 与 PCT 水平呈正相关（$P<0.05$；表 2）。

2.3 影响高龄 CAP 患者疾病严重程度的多因素 logistic 回归分析

以重症 CAP 作为因变量，将表 1 中有意义的指标作为自变量，纳入多因素 logistic 回归模型，结果提示，血清 CRP、PCT、NLR、suPAR、PTX3、CURB-65 及 PSI 评分是高龄 CAP 患者病情严重程度的影响因素（表 3）。

2.4 死亡组与存活组血清 suPAR、PTX3、NLR、CURB-65 评分及 PSI 评分情况比较

共 12 例（8.22%）患者 30 d 内病死。死亡组患者血清 suPAR、PTX3、NLR、CURB-65 评分及 PSI 评分均高于存活组，差异有统计学意义（$P<0.05$；表 4）。

2.5 血清 suPAR、PTX3 及 NLR 对高龄 CAP 患者预后的预测价值

血清 suPAR、PTX3、NLR 及 CURB-65、PSI 评分在预测 CAP 患者死亡中均具有一定价值，且血清 suPAR、PTX3、NLR 在预测 CAP 患者死亡中的效能高于 CURB-65 及 PSI 评分（表 5；图 1）。

表 2 高龄 CAP 患者血清 suPAR、PTX3 及 NLR 水平与疾病严重程度相关性

Table 2 Correlation of serum suPAR, PTX3 and NLR levels with disease severity in elderly patients with CAP

Item	Serum suPAR		Serum PTX3		NLR	
	r	*P* value	*r*	*P* value	*r*	*P* value
CURB-65	0.396	<0.001	0.281	0.020	0.325	<0.001
PSI	0.279	0.039	0.276	0.041	0.246	0.046
CRP	0.349	<0.001	0.233	0.076	0.306	<0.001
PCT	0.221	0.089	0.321	<0.001	0.176	0.345

suPAR: soluble urokinase-type plasminogen activator receptor; PTX3: pentraxin 3; NLR: neutrophil-to-lymphocyte ratio; CAP: community-acquired pneumonia; CURB-65: confusion, uremia, respiratory, blood pressure, age ≥65 years; PSI: pneumonia severity index; CRP: C-reactive protein; PCT: procalcitonin.

表 3 影响高龄 CAP 患者疾病严重程度的多因素 logistic 回归分析

Table 3 Multivariate logistic regression analysis of disease severity in elderly patients with CAP

Factor	β	*SE*	*Wald* χ^2	*OR*	*P* value	95%*CI*
WBC	0.268	0.169	2.515	1.307	0.114	0.939-1.821
CRP	0.351	0.169	4.314	1.420	0.038	1.020-1.978
PCT	0.443	0.175	6.408	1.557	0.012	1.105-2.195
Neutrophil ratio	0.374	0.193	3.755	1.454	0.053	0.996-2.122
Lymphocyte ratio	0.415	0.223	3.463	1.514	0.063	0.978-2.345
NLR	0.439	0.136	10.420	1.551	0.001	1.188-2.025
Serum suPAR	0.568	0.187	9.226	1.765	0.003	1.223-2.546
Serum PTX3	0.675	0.269	6.297	1.964	0.012	1.159-3.328
CURB-65	0.723	0.235	9.465	2.061	0.002	1.300-3.266
PSI	0.498	0.151	10.877	1.645	0.001	1.224-2.212

WBC: white blood cell; CRP: C-reactive protein; PCT: procalcitonin; NLR: neutrophil-to-lymphocyte ratio; suPAR: soluble urokinase-type plasminogen activator receptor; PTX3: pentraxin 3; CURB-65: confusion, uremia, respiratory, blood pressure, age ≥65 years; PSI: pneumonia severity index; CAP: community-acquired pneumonia.

表 4 死亡组与存活组血清 suPAR、PTX3、NLR、CURB-65 评分及 PSI 情况比较

Table 4 Comparison of serum suPAR, PTX3, NLR, CURB-65 score and PSI between death group and survival group ($\bar{x}\pm s$)

Group	*n*	Serum suPAR (ng/ml)	Serum PTX3 (ng/ml)	NLR	CURB-65 (points)	PSI
Death	12	8.44±1.86	17.16±3.15	11.92±2.64	2.47±0.52	98.69±19.54
Survival	134	2.93±0.53	7.66±2.17	5.98±1.48	1.55±0.37	69.33±13.58
t		25.268	13.951	12.332	7.961	6.899
P value		<0.001	<0.001	<0.001	<0.001	<0.001

suPAR: soluble urokinase-type plasminogen activator receptor; PTX3: pentraxin 3; NLR: neutrophil-to-lymphocyte ratio; CURB-65: confusion, uremia, respiratory, blood pressure, age ≥65 years; PSI: pneumonia severity index.

表5 血清suPAR、PTX3及NLR对高龄CAP患者预后的预测价值

Table 5 Prognostic value of serum suPAR, PTX3 and NLR in elderly patients with CAP

Item	Optimum cutoff value	AUC	95%*CI*	*P* value	Sensitivity	Specificity
Serum suPAR	4.02 ng/ml	0.809	0.719-0.899	<0.001	0.833	0.778
Serum PTX3	10.82 ng/ml	0.788	0.631-0.905	0.002	0.667	0.785
NLR	8.60	0.836	0.727-0.945	<0.001	0.750	0.881
CURB-65	2.5 points	0.563	0.471-0.369	0.099	0.250	0.963
PSI	78.5 points	0.714	0.619-0.849	0.007	0.415	0.585

suPAR: soluble urokinase-type plasminogen activator receptor; PTX3: pentraxin 3; NLR: neutrophil-to-lymphocyte ratio; CAP: community-acquired pneumonia; CURB-65: confusion, uremia, respiratory, blood pressure, age ≥65 years; PSI: pneumonia severity index; AUC: area under the curve.

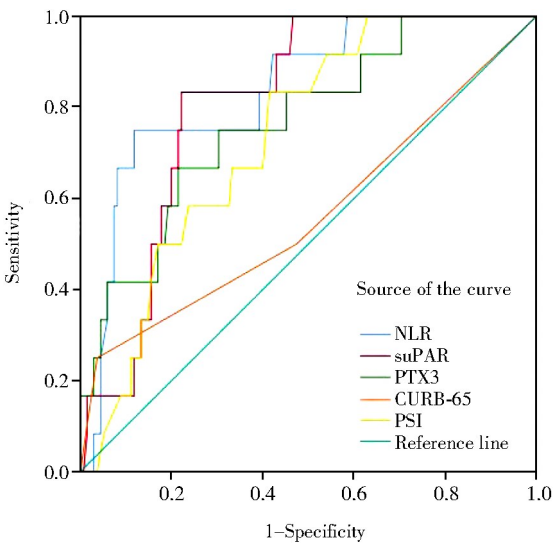


图1 预测高龄CAP患者预后的ROC曲线

Figure 1 ROC curve for predicting prognosis in elderly patients with CAP

CAP: community-acquired pneumonia; ROC: receiver operating characteristic; suPAR: soluble urokinase-type plasminogen activator receptor; PTX3: pentraxin 3; NLR: neutrophil-to-lymphocyte ratio; CURB-65: confusion, uremia, respiratory, blood pressure, age ≥65 years; PSI: pneumonia severity index.

3 讨 论

与传统肺炎相关评分系统比较,血清学检测更为方便便捷,某些血清指标在评估CAP患者病情中具有一定价值,但大多集中在中青年及80岁以下老年人中[8-10]。而年龄≥80岁的高龄患者具有免疫力低下、并发症多、营养不良等特征,受以上因素影响,实验室检查结果在反映其疾病病情中的准确度下降,故有必要将高龄CAP患者进行单独讨论。本研究结果显示,血清suPAR、PTX3及NLR水平在反映高龄CAP患者病情及预后中均具有良好的效能,说明以上指标在高龄CAP患者中也具有良好的临床应用价值。

suPAR在中性粒细胞、巨噬细胞、淋巴细胞等多种免疫细胞表面表达。CAP的肺部局部免疫应答过程中,肺上皮细胞会通过B2整合素CD11b/CD18途径介导中性粒细胞增殖,导致血清suPAR水平上升[11]。PTX3是一种急性期反应蛋白,正常情况下,血清PTX3含量较低,但在发生炎症反应时,在各种炎症因子的作用下,血清PTX3水平将急剧上升[12]。NLR作为反映机体中性粒细胞与淋巴细胞动态平衡的指标,其在评估全身炎症反应中具有良好的应用价值[13]。

本研究中,重症CAP组患者血清suPAR、PTX3及NLR水平较非重症CAP组明显升高,此外,以上指标与传统评分系统CURB-65、PSI及炎症指标CRP、PCT之间存在相关性。多因素logistic回归分析提示,血清suPAR、PTX3及NLR水平均是影响CAP发展至重症的相关因素,且其在判断患者预后中的效能也高于传统肺炎系统相关评分系统。

既往研究曾报道,suPAR、PTX3及NLR在判断中青年及年轻老年人CAP病情严重程度及预后中具有一定价值[14-16],而本研究发现这些指标在诊断高龄CAP病情严重程度及预后中也具有良好的价值,提示以上指标受年龄的影响较小,可成为高龄CAP患者病情及预后判断的参考指标。

综上所述,血清suPAR、PTX3及NLR在反映高龄CAP患者病情严重程度及预后中具有一定价值。但本研究也具有一定的局限性,如并未对各指标进行动态监测,未对各指标在肺泡灌洗液中的水平进行检测,且本研究属于单中心研究,样本量较小,数据存在偏倚,所得结论还需加大样本量进行验证。后续还可针对以上不足调整研究方案,开展深入系统的研究。

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