·临床研究·

老年支气管扩张症-慢性阻塞性肺疾病重叠综合征患者临床特征与心理特征分析

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【摘 要】 目的 研究老年支气管扩张症-慢性阻塞性肺疾病重叠综合征(BCOS)患者临床特征及心理特征。**方法** 将2023年5月至2024年6月海安市人民医院接收的215例慢性阻塞性肺疾病急性加重期(AECOPD)患者作为研究对象,根据患者高分辨率CT(HRCT)表现,将其分为COPD组(n=128)与BCOS组(n=87)。比较BCOS及COPD患者临床资料、实验室指标、血气分析、肺功能以及痰液病原菌培养分析结果等资料。采用心理痛苦温度计(DT)调查患者心理痛苦状况,采用医院焦虑抑郁量表(HADS)评估患者焦虑抑郁状况。采用SPSS 26.0软件进行数据分析。根据数据类型,组间比较分别采用t检验、χ^2检验及秩和检验。**结果** BCOS组患者过去1年内COPD急性加重次数≥2次者占比及慢性阻塞性肺疾病全球创议(GOLD)分级、外周血C反应蛋白(CRP)、系统免疫炎症指数(SII)、二氧化碳分压($PaCO_2$)高于COPD组;预后营养指数(PNI)、血氧分压(PaO_2)、第一秒用力呼气容积占预计值百分比(FEV1%pred)水平低于COPD组;铜绿假单胞菌检出率、咯血症状发生率均高于COPD组,差异均有统计学意义(均P<0.05)。BCOS组患者DT量表得分及显著痛苦检出率,焦虑量表得分及焦虑检出率均高于COPD组,差异均有统计学意义(P<0.05)。**结论** 与单纯COPD患者相比,BCOS患者咯血症状发生率及1年内COPD急性加重次数更高,患者氧合能力及肺功能更差,肺通气功能障碍严重,痰液中铜绿假单胞菌检出率高,机体炎症反应更强,营养状况更差,且心理痛苦及焦虑检出率更高,建议临床积极对存在以上特征的COPD患者进行支气管扩张症筛查,且对BCOS患者进行适当的心理干预

【关键词】 老年人;支气管扩张症-慢阻肺重叠综合征;临床特征
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Clinical and psychological characteristics of elderly patients with bronchiectasis-chronic obstructive pulmonary disease overlap syndrome

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【Abstract】 Objective To investigate the clinical and psychological characteristics of elderly patients with bronchiectasis-chronic obstructive pulmonary disease overlap syndrome (BCOS). **Methods** A total of 215 patients with acute exacerbation of chronic obstructive pulmonary disease (AECOPD) admitted to our hospital from May 2023 to June 2024 were enrolled, and based on the findings of high-resolution CT (HRCT), they were divided into a chronic obstructive pulmonary disease (COPD) group (n=128) and a BCOS group (n=87). Clinical data, laboratory indicators, results of blood gas analysis, pulmonary function indicators and sputum pathogenic culture results were compared between two groups. Distress thermometer (DT) was used to assess psychological distress, and the hospital anxiety and depression scale (HADS) was employed to evaluate anxiety and depression. SPSS statistics 26.0 was used for statistical analysis. Data comparison between two groups was performed using t test, χ^2 test and rank-sum test depending on data type. **Results** The BCOS group exhibited significantly more patients experiencing ≥ twice of acute exacerbations of COPD in the past year, higher grade in Global Initiative for Chronic Obstructive Lung Disease (GOLD) grading, increased peripheral blood C-reactive protein (CRP), and elevated systemic immune-inflammation index (SII) and partial pressure of carbon dioxide ($PaCO_2$), but lower prognostic nutritional index (PNI), decreased partial pressure of blood oxygen (PaO_2) and forced expiratory volume in one second as a percentage of the predicted value (FEV1%pred) than the COPD group (P<0.05). The detection rate of *Pseudomonas aeruginosa* and incidence of hemoptysis were obviously higher in the BCOS group than in the COPD group (P<0.05). The score of DT scale, detection rate of significant distress, as well as anxiety scores and the detection rate of anxiety, were higher in the BCOS group than in the COPD group (P<0.05). **Conclusion** Compared with patients with simple COPD, BCOS patients have a higher incidence of hemoptysis and more frequent COPD

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acute exacerbations within 1 year, poorer oxygenation capacity and pulmonary function, more severe ventilatory dysfunction, a higher detection rate of *Pseudomonas aeruginosa* in sputum, stronger systemic inflammatory response, and poorer nutritional status, as well as higher detection rates of psychological distress and anxiety. It is recommended that clinicians actively screen for bronchiectasis in COPD patients with these characteristics and provide appropriate psychological intervention for BCOS patients.

【Key words】 aged; bronchiectasis-chronic obstructive pulmonary disease overlap syndrome; clinical characteristics

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支气管扩张症的诊断是一种解剖学诊断,主要通过 CT 检查确诊,支气管扩张症患者胸部 CT 显示存在气道扩张、变形等改变。慢性阻塞性肺疾病(chronic obstructive pulmonary disease,COPD)的诊断是一种病理生理学诊断。两者均是临床常见疾病,且同时患有 COPD 与支气管扩张症的病例不在少数,2002 年,学者 Barker 首次提出支气管扩张症-COPD 重叠综合征(bronchiectasis-chronic obstructive pulmonary disease overlap syndrome, BCOS)这一概念[1]。有研究表示,与单病相比,BCOS 将增加患者 COPD 急性加重发作频率,加大患者 5 年死亡风险[2]。但目前,关于 BCOS 的流行病学、临床特征、治疗方案及预后等分析均处于研究阶段。基于此,本研究通过对比 BCOS 及单纯 COPD 患者实验室指标、肺功能、血气分析结果、痰液病原菌及临床症状等,总结 BCOS 相关特征,并调查患者心理痛苦及焦虑抑郁等心理健康情况,旨在为 BCOS 的筛查及干预提供参考,现将结果报道如下。

1 对象与方法

1.1 研究对象

将 2023 年 5 月至 2024 年 6 月海安市人民医院收治的 215 例慢性阻塞性肺疾病急性加重期(acute exacerbation of chronic obstructive pulmonary disease, AECOPD)患者作为研究对象,根据患者 HRCT 表现,将其分为 COPD 组与 BCOS 组。

诊断标准如下。(1)COPD 诊断参照中华医学会呼吸病学分会制定的《慢性阻塞性肺疾病基层诊疗指南》[3]。(2)支气管扩张症诊断参照中华医学会《成人支气管扩张症诊治专家共识》[4],经高分辨率 CT(high resolution CT, HRCT)检查结果同时具有以下表现即可,①细支气管体的直径>伴行肺动脉;②气管腔未见逐渐变细,即气管直径近端<远端;③肋胸膜下 1 cm 内可见支气管。纳入标准:年龄≥60 岁;所有患者均行 HRCT 检查,影像检查图像清晰,可用于研究;所有患者符合 COPD 相关诊断标准;BCOS 组患者同时符合支气管扩张症诊断标准;神志清楚,可配合完成相关调查。排除标准:合并其他肺部疾病;合并心脑肾等重要器官功能严重障碍;合并恶性肿瘤;病历资料不全。

1.2 方法

1.2.1 资料收集 (1)基线资料:包括性别、年龄、体质量指数(body mass index, BMI)、高血压、糖尿病、肺结核、病程、过去 1 年 COPD 急性加重次数等。(2)实验室指标:包括白细胞(white blood cell, WBC)计数、血红蛋白(hemoglobin, Hb)、C 反应蛋白(C-reactive protein, CRP)、纤维蛋白原(fibrinogen, FIB)、D-二聚体(D-dimer, D-D),计算系统免疫炎症指数(systemic immune-inflammation index, SII)及预后营养指数(prognostic nutritional index, PNI)。SII=PLT×N/L,PNI=5×L+ALB。(3)血气指标:采用全自动血气分析仪检测动脉血 pH、血氧分压(arterial partial pressure of oxygen, PaO_2)、二氧化碳分压(arterial carbon dioxide partial pressure, $PaCO_2$)等。(4)痰液病原学分析:收集患者痰液标本,要求患者用力从呼吸道深部咳出痰液,随即吐入痰盒,立即送检。由实验室工作人员利用梅里埃全自动细菌鉴定及药敏分析仪 VITEK 进行分析。(5)肺功能指标:患者入院后第 1 天,采用德国耶格肺功能仪(Master Screen Paed)检测患者肺功能,检测指标包括用力肺活量(forced vital capacity, FVC)、第一秒用力呼气容积占预计值百分比(forced expiratory volumem one second% pred, FEV1%pred)、FEV1/FVC 等。(6)根据慢性阻塞性肺疾病全球创议(Global Initiative for Chronic Obstructive Lung Disease, GOLD)分级进行严重程度分级,分为 GOLD 1~4 级。(7)临床症状统计:包括咳嗽、咳痰、喘息、胸闷气短、呼吸困难及咯血。

1.2.2 心理特征 采用心理痛苦温度计(distress thermometer, DT)调查患者心理痛苦状况[5]。使用视觉模拟直尺式的单条目自评量表,0 分为无心理痛苦,10 分为心理极度痛苦,得分≥4 分被认为心理痛苦显著。采用医院焦虑抑郁量表(hospital anxiety and depression scale, HADS)[6]评估患者焦虑及抑郁情绪,HADS 量表包括焦虑以及抑郁两个分量表,两份量表得分范围均为 0~21 分,各量表得分>8 分即表示出现焦虑/抑郁症状。

1.3 统计学处理

采用SPSS 26.0统计软件进行数据分析。计量资料使用Kolmogorov-Smirnov正态性检验、Levene方差齐性检验，符合正态分布的计量资料用均数±标准差（$\bar{x}\pm s$）表示，采用t检验。计数资料用例数（百分率）表示，采用χ^2检验；对1<理论频数<5的四格表计数资料进行连续矫正χ^2检验，等级资料采用秩和检验。$P<0.05$为差异有统计学意义。

2 结 果

2.1 两组患者临床资料

215例老年AECOPD患者中有87例经HRCT诊断为支气管扩张，被纳为BCOS组（$n=87$），BCOS检出率为40.47%，其余患者纳为COPD组（$n=128$）。BCOS组患者过去1年内COPD急性加重次数≥2次者占比及GOLD分级高于COPD组，差异均有统计学意义（$P<0.05$）；其余指标比较，差异均无统计学意义（均$P>0.05$；表1）。

表1 两组患者临床资料比较

Table 1 Comparison of clinical data between two groups

［n(%)］

Item	BCOS group (n=87)	COPD group (n=128)	χ^2/Z	P value
Gender			0.045	0.831
Male	61(70.14)	88(68.75)		
Female	26(29.89)	40(31.25)		
Age			0.323	0.570
60-<80 years	34(39.08)	55(42.97)		
≥80 years	53(60.92)	73(57.03)		
BMI			1.509	0.470
<18.5 kg/m^2	14(16.09)	17(13.28)		
18.5-<24.0 kg/m^2	55(63.22)	91(71.09)		
≥24.0 kg/m^2	18(20.69)	20(15.63)		
Hypertension	31(35.63)	50(39.06)	0.260	0.610
Diabetes mellitus	11(12.64)	10(7.81)	1.372	0.242
Previous pulmonary tuberculosis	18(20.69)	15(11.72)	3.208	0.073
COPD course			0.509	0.476
<10 years	20(22.99)	24(18.75)		
≥10 years	68(78.16)	104(81.25)		
Number of acute exacerbations of COPD in the past 1 year			12.455	<0.001
≤1	30(34.48)	18(14.06)		
≥2	57(65.52)	110(85.94)		
GOLD grading			24.120	<0.001
Mild	2(2.30)	18(14.06)		
Moderate	27(31.03)	65(50.78)		
Severe	44(50.58)	38(29.69)		
Extremely severe	14(16.09)	7(5.47)		

BCOS: bronchiectasis-chronic obstructive pulmonary disease overlap syndrome; COPD: chronic obstructive pulmonary disease; BMI: body mass index; GOLD: Global Initiative for Chronic Obstructive Lung Disease.

2.2 两组患者实验室指标、血气分析及肺功能指标

BCOS组患者CRP、SII、$PaCO_2$高于COPD组，PNI、PaO_2、FEV1%pred水平低于COPD组，差异均有统计学意义（$P<0.05$）；其余指标比较，差异均无统计学意义（均$P>0.05$；表2）。

表2 两组患者实验室指标、血气分析以及肺功能指标比较

Table 2 Comparison of laboratory indicators, blood gas analysis and pulmonary function indicators between two groups

（$\bar{x}\pm s$）

Item	BCOS group (n=87)	COPD group (n=128)	t	P value
Laboratory indicators				
WBC(×10^9/L)	8.13±1.76	8.22±1.94	0.346	0.729
Hb(g/L)	144.65±16.79	147.49±19.86	1.094	0.275
CRP(mg/L)	39.26±7.15	18.25±2.26	31.069	<0.001
FIB(g/L)	3.65±0.94	3.59±0.89	0.474	0.636
D-D(mg/L)	0.41±0.16	0.38±0.17	1.300	0.195
SII	949.83±278.25	574.27±146.97	12.865	<0.001
PNI	36.53±5.19	44.04±5.27	10.319	<0.001
Blood gas indicators (mmHg)				
$PaCO_2$	45.29±7.45	40.23±6.65	5.214	<0.001
PaO_2	61.39±5.74	67.66±5.83	7.789	<0.001
Pulmonary function				
FVC(L)	74.96±8.65	74.39±8.85	0.468	0.640
FEV1%pred	48.23±6.21	57.43±6.29	10.581	<0.001
FEV1/FVC	49.26±5.57	50.31±5.46	1.373	0.171

BCOS: bronchiectasis-chronic obstructive pulmonary disease overlap syndrome; COPD: chronic obstructive pulmonary disease; WBC: white blood cell; Hb: hemoglobin; CRP: C-reactive protein; FIB: fibrinogen; D-D: D-dimer; SII: systemic immune-inflammation index; PNI: prognostic nutritional index; $PaCO_2$: arterial carbon dioxide partial pressure; PaO_2: arterial partial pressure of oxygen; FVC: forced vital capacity; FEV1%: forced expiratory volumem one second%pred. 1 mmHg=0.133 kPa.

2.3 两组患者痰液病原菌培养结果

BCOS组患者铜绿假单胞菌检出率高于COPD组，差异有统计学意义（$P<0.05$）；其余指标比较，差异均无统计学意义（均$P>0.05$；表3）。

2.4 两组患者临床症状比较

BCOS组患者咯血症状发生率高于COPD组，差异有统计学意义（$P<0.05$）；其余指标比较，差异均无统计学意义（均$P>0.05$；表4）。

2.5 两组患者心理特征比较

BCOS组患者DT量表得分及显著痛苦检出率，焦虑量表得分及焦虑检出率均高于COPD组，差异均有统计学意义（$P<0.05$）；其余指标比较，差异均无统计学意义（均$P>0.05$；表5）。

表 3 两组患者痰液病原菌培养结果比较

Table 3 Comparison of sputum pathogenic bacteria culture results between two groups [n(%)]

Group	n	*Candida albicans*	*Acinetobacter baumannii*	*Streptococcus pneumoniae*	*Haemophilus influenzae*	*Klebsiella pneumoniae*	*Pseudomonas aeruginosa*
BCOS	87	10(11.49)	1(1.15)	3(3.45)	3(3.45)	4(4.60)	14(16.09)
COPD	128	6(4.69)	4(3.13)	1(0.78)	5(3.91)	3(2.34)	4(3.13)
χ^2		3.484	0.233	0.822	0.037	0.273	11.353
P value		0.062	0.630*	0.365*	0.847*	0.601*	<0.001

BCOS: bronchiectasis-chronic obstructive pulmonary disease overlap syndrome; COPD: chronic obstructive pulmonary disease. *Continuous corrected *Chi*-square test.

表 4 两组患者临床症状比较

Table 4 Comparison of clinical symptoms between two groups [n(%)]

Group	n	Cough	Expectoration	Wheezing	Chest tightness and shortness of breath	Dyspnea	Hemoptysis
BCOS	87	84(96.55)	77(88.51)	34(39.08)	31(35.63)	11(12.64)	18(20.89)
COPD	128	126(98.44)	114(89.06)	52(40.63)	50(39.06)	24(18.75)	1(0.78)
χ^2		0.193	0.016	0.052	0.260	1.417	25.482
P value		0.660*	0.899	0.820	0.610	0.234	<0.001

BCOS: bronchiectasis-chronic obstructive pulmonary disease overlap syndrome; COPD: chronic obstructive pulmonary disease. *Continuous corrected *Chi*-square test.

表 5 两组患者心理特征比较

Table 5 Comparison of psychological characteristics between two groups

Group	n	DT scale score (points, $\bar{x}\pm s$)	Incidence rate of significant distress[n(%)]	Anxiety scale score(points, $\bar{x}\pm s$)	Detection rate of anxiety[n(%)]	Depression scale score(points, $\bar{x}\pm s$)	Detection rate of depression[n(%)]
BCOS	87	3.63±0.91	57(65.52)	7.46±1.24	42(48.28)	6.25±1.06	30(34.48)
COPD	128	2.65±0.77	58(45.31)	7.02±1.13	45(35.16)	6.13±1.01	37(28.91)
t/χ^2		8.504	8.499	2.694	5.842	0.838	0.751
P value		<0.001	0.004	0.008	0.016	0.403	0.386

BCOS: bronchiectasis-chronic obstructive pulmonary Disease overlap syndrome; COPD: chronic obstructive pulmonary disease; DT: distress thermometer.

3 讨 论

本研究以 HRCT 检查结果作为支气管扩张症的诊断依据,结果显示,215 例老年 AECOPD 患者中 BCOS 检出率为 40.47%(87/215),提示老年 COPD 患者中合并支气管扩张症者较为常见。由于 COPD 与支气管扩张症的临床症状相似,COPD 相关症状覆盖支气管扩张症症状导致临床对 BCOS 的诊断不足。但有研究数据显示,BCOS 患者 5 年死亡率是单纯支气管扩张症患者的 3 倍[7]。有效筛查并诊断 BCOS 是及时调整治疗方案、改善患者预后的重要前提。

总结 BCOS 临床特征,可为 BCOS 的筛查提供参考。其中临床症状是最易观察获得的指标,经比较发现 COPD 组及 BCOS 组患者咳嗽、咳痰、喘息、胸闷气短、呼吸困难等症状频率相似,但 BCOS 组患者咯血症状发生率明显高于 COPD 组。提示临床应重视合并咯血症状 COPD 患者的胸部 CT 检查,谨防 BCOS 漏诊。

血气分析及肺功能检测是评估患者通气功能的重要手段,本研究中,BCOS 患者血气分析指标 $PaCO_2$ 高于 COPD 组,PaO_2 低于 COPD 组,提示 BCOS 患者氧合能力更差,此外,BCOS 组患者肺功能指标 FEV1%pred 水平更低,提示 BCOS 患者肺功能更差,肺通气功能障碍更为严重。有研究人员发现,支气管扩张程度与 PaO_2 之间呈负相关,且肺通气与灌注的失衡可能是导致 COPD 气道细菌定植作用机制之一[8]。本研究的痰液病原菌检测结果显示,BCOS 组患者铜绿假单胞菌检出率更高,铜绿假单胞菌是支气管扩张症的常见病原菌,同时,铜绿假单胞菌定植已被证实为严重阻塞性气流的标志,也是 COPD 患者肺功能下降及死亡的危险因素[9]。提示临床应注重氧合能力差、肺通气障碍严重及痰液铜绿假单胞菌检出阳性者的胸部 CT 检查。

此外,BCOS 患者与单纯 COPS 患者部分实验室检查结果中也存在差异,本研究发现,BCOS 组患者 CRP、SII 水平高于 COPD 组,PNI 水平低于 COPD 组。CRP 是常见的炎症指标,SII 是一个综合性的可反映炎症及免疫应答的新型指标[10]。PNI 是一种反应机体营养及炎症状况的指标[11]。以上研究提示,BCOS 患者机体炎症反应更为强烈,营养状况更差。

COPD急性加重发作是导致支气管扩张发生及发展的重要因素之一,这与COPD急性加重发作会加强支气管炎症反应,进而破坏支气管结构,促进支气管扩张有关[12,13]。本研究中,BCOS患者近1年内COPD急性加重发作次数高于COPD组,且后续研究证实过去1年COPD疾病加重次数≥2次是BCOS的危险因素。故建议临床重视COPD疾病加重频繁患者的胸部CT检查,积极筛查其是否合并支气管扩张症。且BCOS的发生还与COPD疾病严重程度密切相关,大量研究均证实,GOLD分级中重度患者支气管扩张症患病率远高于轻度患者,本研究发现,BCOS患者GOLD分级普遍高于COPD患者,故建议临床还应注重GOLD分级中重度COPD患者的胸部CT检查。

COPD患者常存在显著的肺外效应,且有学者表示,呼吸系统疾病患者更易出现情绪障碍[14]。但在临床中,医护人员对COPD患者的情绪障碍关注较少。而长期的情绪障碍会导致器官功能障碍,促进疾病发生与恶化[15-17]。本研究结果发现,相较于COPD患者,BCOS患者显著心理痛苦检出率及DT得分更高,且焦虑检出率及焦虑量表得分也更高,提示BCOS患者存在更为严重的心理痛苦及焦虑情绪,有必要对其进行心理评估与心理干预。

综上,与单纯COPD患者相比,BCOS患者咯血症状发生率及1年内COPD急性加重次数更高,患者氧合能力及肺功能更差,肺通气功能障碍严重,痰液中铜绿假单胞菌检出率高,机体炎症反应更强,营养状况更差,且心理痛苦及焦虑检出率更高,建议临床积极对存在以上特征的COPD患者进行支气管扩张症筛查,且对BCOS患者进行适当的心理干预。但本研究所有样本均来源于同一所医院,样本代表性弱,所得结论还需增加样本量,开展多中心研究加以验证。

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