doi: 10.13241/j.cnki.pmb.2023.21.025

不同类型慢性心力衰竭患者临床特征及心功能危险因素、预后影响因素分析 *

王燕芳[1] 王丽媛[2] 赵炜祎[1] 刘志宏[1] 杨丽云[1]

（内蒙古自治区人民医院 1 老年医学中心保 5 科；2 心血管内科 内蒙古 呼和浩特 010017）

摘要 目的：分析不同类型慢性心力衰竭患者临床特征及心功能危险因素、预后影响因素。**方法：**回顾性分析 2020 年 1 月 -2022 年 1 月我院收治的慢性心力衰竭患者 80 例，根据左室射血分数（LVEF）分为 A 组（n=25，LVEF<30%）、B 组（n=25，LVEF 40%~50%）、C 组（n=25，LVEF≥50%）三组，另根据随访 1 年后是否存活分为生存组（n=51）和死亡组（n=29）。比较不同组别临床相关指标，采用 Pearson 检验分析患者临床特征与慢性心力衰竭患者心功能、预后之间的相关性，采用多因素 Logistic 回归分析影响慢性心力衰竭患者心功能、预后的独立危险因素。**结果：**A 组的心率及患有冠心病、心律失常 1 年以上、合并非心血管疾病人数占比、LAD、RAD、Scr、Hcy 水平高于 B 组和 C 组（*P*<0.05）。死亡组的心率及患有冠心病、心律失常 1 年以上、LAD、RAD、Scr 水平明显高于生存组（*P*<0.05）。Pearson 相关性检验显示，心率、冠心病、心律失常、合并非心血管疾病、LAD、RAD、Scr、Hcy 水平与慢性心力衰竭患者心功能之间呈正相关（*P*<0.05）；心率、冠心病、心律失常、LAD、RAD、Scr 水平与慢性心力衰竭患者预后之间呈正相关（*P*<0.05）。多因素 Logistic 回归分析结果显示，心率、冠心病、心律失常、合并非心血管疾病、LAD、RAD、Scr、Hcy 水平是影响慢性心力衰竭患者心功能的独立危险因素（*P*<0.05）；心率、冠心病、心律失常、LAD、RAD、Scr 水平是影响慢性心力衰竭患者预后的独立危险因素（*P*<0.05）。**结论：**心率、冠心病、心律失常、LAD、RAD、Scr 水平与慢性心力衰竭患者心功能、预后之间均呈正相关，是影响慢性心力衰竭患者心功能、预后的独立危险因素，可用来预测慢性心力衰竭的发生。

关键词：慢性心力衰竭；临床特征；心功能；危险因素；预后

中图分类号：R541.61 **文献标识码：**A **文章编号：**1673-6273(2023)21-4130-07

Analysis of Clinical Characteristics and Risk Factors for Cardiac Function and Prognostic Influences in Patients with Different Types of Chronic Heart Failure*

WANG Yan-fang[1], WANG Li-yuan[2], ZHAO Wei-yi[1], LIU Zhi-hong[1], YANG Li-yun[1]

(1 Department 5 Geriatric Medicine Center; 2 Department of Cardiovascular Medicine, People's Hospital of Inner Mongolia Autonomous Region, Hohhot, Inner Mongolia, 010017, China)

ABSTRACT Objective: To analyze the clinical characteristics and cardiac function risk factors and prognostic influences of patients with different types of chronic heart failure. **Methods:** We retrospectively analyzed 80 patients with chronic heart failure admitted to our hospital between January 2020 and January 2022, and divided them into three groups according to left ventricular ejection fraction (LVEF): group A (n=25, LVEF <30%), group B (n=25, LVEF 40%-50%), and group C (n=25, LVEF ⩾50%), and compared the clinical data of the three groups, and also divided the occurrence group into survival group (n=51) and death group (n=29) according to whether they survived after 1 year of follow-up, and compared the clinical related indexes of the two groups, Pearson test was used to analyze the correlation between clinical characteristics of patients and cardiac function and prognosis of patients with chronic heart failure. Multi-factor logistic regression was used to analyze the independent risk factors affecting cardiac function and prognosis in patients with chronic heart failure. **Results:** The heart rate and the percentage of people with coronary artery disease, arrhythmia for more than 1 year, combined non-cardiovascular disease, LAD, RAD, Scr, and Hcy levels were higher in group A than in groups B and C (*P*<0.05). The heart rate and the levels of having coronary artery disease, arrhythmia for more than 1 year, LAD, RAD, and Scr were significantly higher in the death group than in the survival group (*P*<0.05). Pearson correlation test showed a positive correlation between heart rate, coronary artery disease, arrhythmia, combined non-cardiovascular disease, LAD, RAD, Scr, Hcy levels and cardiac function in patients with chronic heart failure (*P*<0.05). There was a positive correlation between heart rate, having coronary artery disease, arrhythmia for more than 1 year, LAD, RAD, Scr levels and prognosis of patients with chronic heart failure (*P*<0.05). Multifactorial logistic regression analysis

* 基金项目：内蒙古自治区 2022 年度卫生健康科技计划项目（202201060）

作者简介：王燕芳（1981-），女，硕士研究生，副主任医师，研究方向：心血管内科及老年疾病的诊疗，E-mail：wang18004853165@163.com

（投稿日期：2023-06-06 接受日期：2023-06-30）

showed that heart rate, coronary artery disease, arrhythmia, combined non-cardiovascular disease, LAD, RAD, Scr, and Hcy levels were independent risk factors for cardiac function in patients with chronic heart failure (P<0.05); Heart rate, having coronary artery disease, arrhythmia for more than 1 year, and LAD, RAD, and Scr levels were independent risk factors affecting the prognosis of patients with chronic heart failure(P<0.05). **Conclusion:** There was a positive correlation between heart rate, coronary artery disease, arrhythmia, LAD, RAD, and Scr levels and cardiac function and prognosis in patients with chronic heart failure, which are independent risk factors affecting cardiac function and prognosis in patients with chronic heart failure and can be used to predict the development of chronic heart failure.

Key words: Chronic heart failure; Clinical features; Cardiac function; Risk factors; Prognosis

Chinese Library Classification(CLC): R541.61 Document code: A

Article ID: 1673-6273(2023)21-4130-07

前言

慢性心力衰竭是在原有的慢性心脏病基础上逐渐出现的心力衰竭的症状和体征，是一个缓慢进行的过程，通常涉及心脏的代偿性扩大或肥大以及心脏的其他代偿机制[1]。慢性心衰可分为慢性左心衰和慢性右心衰，慢性左心衰竭主要表现为不同程度的呼吸困难，其次是咳嗽、排痰和咯血，少数左心衰竭的患者还可能出现运动耐力下降、疲劳和虚弱[2]。慢性右心衰竭可能导致循环系统血液瘀滞，其特点是恶心、呕吐、食欲不振、腹胀、下肢肿胀以及运动耐力下降和疲劳，少数患者还可能出现反应迟钝和记忆力减退[3,4]。慢性心力衰竭发展相对缓慢，身体逐渐形成代偿机制，该病是一种常见的临床综合征，由多种原因引起，冠状动脉疾病和高血压最为常见，其中冠状动脉疾病占 57%，高血压占 30%[5,6]。有研究表明，超过 86%的慢性心力衰竭老年患者有多种合并症，40%的慢性心力衰竭患者在任何时候都有 5 种以上的非心血管慢性疾病，不仅使慢性心力衰竭的临床治疗复杂化，而且严重影响患者的生活质量，增加不良预后[7]。慢性心力衰竭是所有心血管疾病的最终阶段，是由长期的心肌重塑过程造成的，不可能在一夜之间完全逆转，对合并症的治疗也缺乏统一标准[8,9]。慢性心力衰竭患者的五年生存率只有 50%左右，因此临床上对于慢性心力衰竭的诊治治疗必须重视[10,11]。本研究旨在分析不同类型慢性心力衰竭患者临床特征及心功能危险因素、预后影响因素，为临床治疗慢性心力衰竭提供理论依据。

1 资料与方法

1.1 研究对象

回顾性分析 2020 年 1 月 -2022 年 1 月我院收治的慢性心力衰竭患者 80 例，其中男性 45 例，女性 35 例；年龄为 55～70 岁，平均年龄为（62.62± 5.19）岁。根据左室射血分数（Left Ventricular Ejection Fractions，LVEF）分为 A、B、C 三组，A 组为 25 例，射血分数降低（LVEF<30%）；B 组为 27 例，射血分数居中（LVEF 40%~50%）；C 组为 28 例，射血分数保留（LVEF≥ 50%）。另根据随访 1 年后是否存活分为生存组（n=51）和死亡组（n=29）。

1.2 纳入与排除标准

纳入标准：① 符合《慢性心力衰竭诊断治疗指南》[12]中的诊断标准；② 彩超有心房增大、收缩运动降低等表现；③ 未合并其他肿瘤疾病；④ 临床资料完整；⑤ 没有治疗使用药物过敏。

排除标准：① 临床资料不完整；② 其他疾病导致肝肾功能严重损害；③ 患有自身免疫性疾病；④ 患有自身消耗类疾病；⑤ 心肌梗塞；⑥ 患有血液系统疾病。

1.3 方法

收集患者临床资料：包括年龄、性别、体质量指数、血压、心率、病史，实验室检查包括血常规：红细胞（RBC）；白细胞（WBC）；血小板（PLT）、肝生物化学指标：谷丙转氨酶（ALT）；血清肌酐（Scr）；甘油三酯（TG）；总胆固醇（TC）；同型半胱氨酸（Hcy）、游离三碘甲状腺原氨酸（FT3）、游离甲状腺素（FT4）、促甲状腺素（TSH）水平，超声影像学检查包括左心房内径（LAD）、左心室内径（LVD）、右心房内径（RAD）、右心室内径（RVD）。

比较 A、B、C 组及生存组、死亡组的临床资料，采用 Pearson 检验分析患者临床特征与慢性心力衰竭患者心功能、预后之间的相关性，采用多因素 Logistic 回归分析影响慢性心力衰竭患者心功能、预后的独立危险因素。

1.4 统计学分析

应用 SPSS 24.0，P<0.05 表示差异有统计学意义。以[n(%)]表示计数资料，行 χ^2 检验。以（$\bar{x}\pm s$）表示计量资料，行 t 检验。采用 Pearson 检验分析相关性。采用多因素 Logistic 回归分析独立危险因素。

2 结果

2.1 临床资料

A 组的心率及患有冠心病、心律失常 1 年以上、合并非心血管疾病人数占比、LAD、RAD、Scr、Hcy 水平高于 B 组和 C 组（P<0.05），见表 1。

2.2 预后分析

死亡组的心率及患有冠心病、心律失常 1 年以上，LAD、RAD、Scr 水平明显高于生存组（P<0.05），见表 2。

2.3 相关性分析

Pearson 相关性检验显示，心率、冠心病、心律失常、合并非心血管疾病、LAD、RAD、Scr、Hcy 水平与慢性心力衰竭患者心功能之间呈正相关（P<0.05）；心率、冠心病、心律失常、LAD、RAD、Scr 水平与慢性心力衰竭患者预后之间呈正相关（P<0.05），见表 3、4。

2.4 多因素分析

多因素 Logistic 回归分析结果显示，心率、冠心病、心律失常、合并非心血管疾病、LAD、RAD、Scr、Hcy 水平是影响慢性心力衰竭患者心功能的独立危险因素（P<0.05）；心率、冠心病、心律失常、LAD、RAD、Scr 水平是影响慢性心力衰竭患者预后的独立危险因素（P<0.05），见表 5、6。

表 1 临床资料比较

Table 1 Comparison of clinical data

Index	Group A(n=25)	Group B(n=27)	GroupC(n=28)	x^2/t	*P*
Sexual distinction[(%)]				1.431	0.489
Man	12(48.00)	15(55.56)	18(64.29)		
Woman	13(52.00)	12(44.44)	10(35.71)		
Age(year)	62.62± 5.46	62.64± 5.87	62.58± 5.32	0.263	0.669
BMI(kg/m^2)	22.12± 0.32	22.13± 0.16	22.14± 0.18	0.051	0.950
Systolic pressure(mm Hg)	136.52± 23.12	136.11± 23.10	137.23± 23.01	0.028	0.973
Diastolic blood pressure(mm Hg)	79.65± 15.23	79.23± 15.12	78.95± 15.69	0.014	0.986
Heart rate on admission (Times/min)	94.65± 24.23[◎◎]	86.52± 14.12[◎]	78.63± 12.10	5.622	0.005
Coronary heart disease				16.997	0.000
More than 1 year	21(84.00)[◎◎]	12(44.44)[◎]	8(28.57)		
Less than 1 year	4(16.00)	15(55.56)	20(71.43)		
High blood pressure				0.170	0.918
More than 1 year	15(60.00)	16(59.26)	18(64.29)		
Less than 1 year	10(40.00)	11(40.74)	10(35.71)		
Cardiac arrhythmia				21.005	0.000
More than 1 year	20(80.00)[◎◎]	13(48.15)[◎]	6(21.43)		
Less than 1 year	5(20.00)	17(62.96)	22(78.57)		
Combined non-cardiovascular disease				16.768	0.000
Yes	20(80.00)[◎◎]	11(40.74)[◎]	7(25.00)		
No	5(20.00)	16(59.26)	21(75.00)		
Blood Count					
RBC(× 10^{12}/L)	4.15± 0.48	4.11± 0.41	4.12± 0.42	0.059	0.943
WBC(× 10^9/L)	7.84± 2.12	7.85± 2.11	7.82± 2.18	0.001	0.999
PLT(× 10^9/L)	216.12± 56.13	216.15± 56.11	217.23± 54.25	0.005	0.995
Liver biology indicators					
ALT(U/L)	21.66± 4.97	21.75± 3.96	21.62± 3.85	0.007	0.993
Scr	94.92± 22.35[◎◎]	85.89± 32.15[◎]	77.62± 18.52	3.163	0.048
TG(mmol/L)	0.96± 0.12	1.02± 0.51	1.11± 0.50	0.844	0.434
TC(mmol/L)	4.42± 0.91	4.41± 0.89	4.18± 0.99	0.578	0.564
Hcy(μmol/L)	18.86± 6.54[◎◎]	17.39± 2.12[◎]	15.32± 1.35	5.436	0.006
FT3(pmol/L)	4.49± 2.51	4.48± 5.26	4.26± 0.89	0.040	0.961
FT4(pmol/L)	19.14± 3.96	20.53± 2.56	19.32± 3.25	1.408	0.251
TSH(U/L)	2.25± 1.56	2.23± 1.61	2.19± 1.87	0.009	0.991
Ultrasonography					
LAD(mm)	39.35± 9.12[◎◎]	36.32± 8.02[◎]	32.12± 5.46	6.038	0.004
LVD(mm)	47.21± 8.65	47.12± 8.14	47.13± 9.65	0.001	0.999
RAD(mm)	29.35± 5.89[◎◎]	27.85± 4.31[◎]	25.45± 4.13	4.476	0.015
RVD(mm)	29.62± 5.14	29.71± 5.26	28.79± 5.23	0.259	0.772

Note: compared with Group B, [◎] *P*<0.05. Compared with Group B, [◎] *P*<0.05.

表 2 影响预后的单因素分析

Table 2 Univariate analysis of prognosis

Index	Survival group(n=51)	Death group(n=29)	x^2/t	*P*
Sexual distinction[(%)]			2.989	0.084
Man	25(49.02)	20(68.97)		
Woman	26(50.98)	9(31.03)		
Age(year)	63.27± 6.01	62.59± 5.72	0.495	0.622
BMI(kg/m^2)	23.12± 0.32	23.13± 0.16	0.120	0.843
Systolic pressure(mm Hg)	135.52± 23.12	135.11± 23.10	0.090	0.929
Diastolic blood pressure (mm Hg)	78.65± 15.23	78.23± 15.12	0.140	0.889
Heart rate on admission (Times/min)	74.65± 24.23	96.52± 14.12	5.569	0.000
Coronary heart disease			8.155	0.004
More than 1 year	20(39.22)	21(72.41)		
Less than 1 year	31(60.78)	8(27.59)		
High blood pressure			0.177	0.674
More than 1 year	31(60.78)	19(65.52)		
Less than 1 year	20(39.22)	10(34.48)		
Cardiac arrhythmia			11.753	0.001
More than 1 year	15(29.41)	20(68.97)		
Less than 1 year	36(70.59)	9(31.03)		
Combined non-cardiovascular disease			0.150	0.699
Yes	33(64.71)	20(68.97)		
No	18(35.29)	9(31.03)		
Blood Count				
RBC(× 10^{12}/L)	4.25± 0.48	4.23± 0.81	0.152	0.880
WBC(× 10^9/L)	7.64± 2.32	7.65± 2.31	0.022	0.983
PLT(× 10^9/L)	215.12± 56.13	214.15± 56.11	0.087	0.931
Liver biology indicators				
ALT(U/L)	27.65± 12.17	27.64± 12.26	0.004	0.997
Scr	84.92± 22.35	105.89± 32.15	3.825	0.000
TG(mmol/L)	0.96± 0.12	1.02± 0.21	1.772	0.083
TC(mmol/L)	4.32± 0.91	4.31± 0.89	0.056	0.955
Hcy(μmol/L)	17.86± 2.54	17.19± 2.82	1.261	0.213
FT3(pmol/L)	4.39± 2.51	4.38± 5.26	0.012	0.990
FT4(pmol/L)	19.24± 3.96	20.13± 2.56	1.348	0.184
TSH(U/L)	2.15± 1.56	2.13± 1.61	0.064	0.949
Ultrasonography				
LAD(mm)	35.35± 6.12	39.32± 4.02	3.872	0.000
LVD(mm)	46.21± 8.65	46.12± 8.14	0.054	0.957
RAD(mm)	25.35± 5.89	29.85± 4.31	4.403	0.000
RVD(mm)	28.62± 5.14	28.71± 5.26	0.087	0.931

表 3 临床特征与慢性心力衰竭患者心功能的相关性

Table 3 Correlation of clinical characteristics with cardiac function in patients with chronic heart failure

Target	Severity of disease	
	r	*P*
Heart rate	0.824	0.015
Coronary heart disease	0.786	0.021
Cardiac arrhythmia	0.795	0.001
Combined non-cardiovascular disease	0.795	0.002
LAD	0.987	0.012
RAD	0.744	0.034
Scr	0.812	0.005
Hcy	0.895	0.020

表 4 临床特征与慢性心力衰竭患者预后的相关性

Table 4 Correlation between clinical characteristics and prognosis of patients with chronic heart failure

Target	Severity of disease	
	r	*P*
Heart rate	0.814	0.017
Coronary heart disease	0.799	0.020
Cardiac arrhythmia	0.833	0.010
LAD	0.796	0.003
RAD	0.789	0.011
Scr	0.745	0.032

表 5 影响慢性心力衰竭患者心功能的多因素 Logistic 回归分析

Table 5 Multifactorial logistic regression analysis affecting cardiac function in patients with chronic heart failure

Variable	β	SE	Wald x^2	*P*	OR	95%CI
Heart rate	1.531	0.524	8.537	0.003	4.623	1.655~12.910
Coronary heart disease	1.544	0.556	7.712	0.006	4.683	1.575~13.926
Cardiac arrhythmia	1.627	0.584	7.762	0.005	5.089	1.620~15.985
Combined non-cardiovascular disease	1.596	0.675	5.591	0.019	4.933	1.314~18.523
LAD	1.605	0.631	6.470	0.011	4.978	1.445~17.146
RAD	1.596	0.628	6.459	0.011	4.933	1.441~16.893
Scr	1.637	0.635	6.646	0.010	5.140	1.481~17.846
Hcy	1.574	0.603	6.814	0.009	4.826	1.480~15.735

表 6 影响慢性心力衰竭患者预后的多因素 Logistic 回归分析

Table 6 Multifactorial logistic regression analysis affecting the prognosis of patients with chronic heart failure

Variable	β	SE	Wald x^2	*P*	OR	95%CI
Heart rate	1.568	0.651	5.801	0.016	4.797	1.339~17.184
Coronary heart disease	1.585	0.639	6.153	0.014	4.879	1.395~17.072
Cardiac arrhythmia	1.613	0.646	6.235	0.013	5.018	1.415~17.799
LAD	1.627	0.596	7.452	0.007	5.089	1.582~16.365
RAD	1.571	0.582	7.286	0.007	4.811	1.538~15.055
Scr	1.662	0.636	6.829	0.009	5.270	1.515~18.330

3 讨论

慢性心力衰竭是心血管疾病的终末阶段,也是导致死亡的主要原因,是21世纪心血管领域的两大挑战之一[13]。根据2003年在中国进行的一项示范性研究,成人心力衰竭的发病率约为0.9%,而发达国家的心力衰竭的发病率约为1%~2%,随着年龄的增长,发病率迅速增加,70岁以上人群的发病率上升到10%以上,心力衰竭患者的总体死亡率在四年内为50%,严重心力衰竭患者在一年内的死亡率高达50%,而年轻心力衰竭患者的死亡率也在增加[14,15]。慢性心力衰竭是心脏病的最后阶段,心脏的结构和功能已经受到病理上的损害,一些患者会出现心脏扩大和心肌纤维化,容易发生心血管事件,与正常人相比,猝死的风险明显增加[16,17]。本研究详细分析了三种不同类型的慢性心力衰竭在心血管和非心血管疾病谱以及多发病负担方面的差异,并根据数据结果为慢性心力衰竭的病因管理和干预提供可靠的依据。

冠心病和心律失常是慢性心力衰竭患者最常见的心血管疾病,而且不同类型的慢性心力衰竭患者合并心血管疾病的发病率也不同[18]。多种疾病并存是慢性心衰患者最常见的临床特征。本研究结果显示,A组的心率及患有冠心病、心律失常1年以上、合并非心血管疾病人数占比、LAD、RAD、Scr、Hcy水平高于B组和C组,死亡组的心率及患有冠心病、心律失常1年以上、LAD、RAD、Scr水平明显高于生存组。分析其原因在于,冠心病和心律失常病患者主要是由于冠状动脉粥样硬化导致管腔狭窄,进而影响心脏的血液供应,削弱心肌的收缩力,导致心脏无法正常射血,容易形成慢性心衰[19]。大多数心力衰竭患者都患有高血压,而长期高血压是导致LAD肥大和扩大的主要原因。由于大动脉的压力增加,LAD不得不通过收缩产生更大的压力将血液射入主动脉或大动脉,导致LAD的后负荷增加。随着时间的推移,LAD长期在高压负荷下工作,最终LAD可能会变得肥大,而且长期的高血压引发肺动脉高压,还会导致RAD的肥大。充血性心力衰竭患者的血液射出量减少,并可能遭受肾脏供血不足,导致肾前肾功能受损,表现为Scr水平升高[20]。Hcy导致内皮细胞损伤和平滑肌细胞增生,引发压力蛋白、氧自由基、炎症介质和促凝物质的产生,一旦身体的新陈代谢受到干扰,Hcy继续在血管中积累,反过来导致心肌和血管的重塑,以及影响心脏舒张和收缩功能的功能障碍,最终导致心力衰竭。

本研究Pearson相关性检验显示,Pearson相关性检验显示,心率、冠心病、心律失常、合并非心血管疾病、LAD、RAD、Scr、Hcy水平与慢性心力衰竭患者心功能之间呈正相关,心率、冠心病、心律失常、LAD、RAD、Scr水平与慢性心力衰竭患者预后之间呈正相关;而且多因素Logistic回归分析结果显示,心率、冠心病、心律失常、合并非心血管疾病、LAD、RAD、Scr、Hcy水平是影响慢性心力衰竭患者心功能的独立危险因素,心率、冠心病、心律失常、LAD、RAD、Scr水平是影响慢性心力衰竭患者预后的独立危险因素。分析其原因在于,冠心病、心律失常的患者心输出量减少,导致流向肝脏的血液减少,加剧了肝细胞的缺血和缺氧,增加了肝细胞的损伤,除此之外,感染和过度用药也是慢性心力衰竭患者肝脏损伤的重要诱因[21]。而肝脏是许多激素转化和分解的器官,肝功能受损会降低醛固酮和抗利尿激素的灭活率,导致继发性醛固酮和抗利尿激素增加,引起水和Scr潴留,加重心衰程度[22]。最近的研究发现,心力衰竭患者的血浆Hcy水平升高,并表明高同型半胱氨酸血症是心力衰竭的一个新的危险因素[23]。心力衰竭的发生与心力衰竭患者的Hcy水平呈正相关,同样,Hcy水平与高血压和心力衰竭患者的低左心室射血分数密切相关。Iyngkaran P[24]等研究表明,心力衰竭患者补充叶酸和维生素可降低血清Hcy水平,而且由于心肌收缩期和舒张期负荷过重,心力衰竭时可能出现心脏结构和功能异常,这是由于心肌的收缩期和舒张期应变过大,通过代偿机制如神经体液机制,可导致心肌肥大和射血分数下降,间接反映了高Hcy水平与慢性心力衰竭患者心功能程度之间的关系,Hcy不仅与心力衰竭的发展和严重程度有关,而且还与心力衰竭的临床预后有关[25]。

综上所述,心率、冠心病、心律失常、LAD、RAD、Scr水平与慢性心力衰竭患者心功能、预后之间均呈正相关,是影响慢性心力衰竭患者心功能、预后的独立危险因素,可用来预测慢性心力衰竭的发生。本研究的不足之处是样本量相对较小,而且是单中心研究,今后可以增加样本量,并进行多中心研究,以获得更好的临床研究。

参考文献(References)

[1] 李文静, 李树仁, 孙明超, 等. 老年人营养风险指数预测住院慢性心力衰竭患者的预后研究. 中国全科医学, 2021, 24(23): 2955-2961

[2] Ksiązczyk M, Lelonek M. Angiotensin receptor/neprilysin inhibitor-a breakthrough in chronic heart failure therapy: summary of subanalysis on paradigm-hf trial findings[J]. Heart Fail Rev, 2020, 25(3): 393-402

[3] DeVore AD, Granger BB, Fonarow GC, et al. Effect of a hospital and postdischarge quality improvement intervention on clinical outcomes and quality of care for patients with heart failure with reduced ejection fraction: the connect-hf randomized clinical trial [J]. JAMA, 2021, 326(4): 314-323

[4] Mtisi TF, Frishman WH. Beta adrenergic blocker use in patients with chronic obstructive pulmonary disease and concurrent chronic heart failure with a low ejection fraction [J]. Cardiol Rev, 2020, 28(1): 20-25

[5] Williams MT, Kozachik SL, Karlekar M, et al. Advance care planning in chronically ill persons diagnosed with heart failure or chronic obstructive pulmonary disease: an integrative review [J]. Am J Hosp Palliat Care, 2020, 37(11): 950-956

[6] Coffman M, Guillot E, Blondel T, et al. Clinical efficacy of a benazepril and spironolactone combination in dogs with congestive heart failure due to myxomatous mitral valve disease: the benazepril spironolactone study (besst) [J]. J Vet Intern Med, 2021, 35(4): 1673-1687

[7] Prince SA, Wooding E, Mielniczuk L, et al. Nordic walking and standard exercise therapy in patients with chronic heart failure: a randomised controlled trial comparison [J]. Eur J Prev Cardiol, 2019, 26(16): 1790-1794

[8] Matsumura K, Teranaka W, Taniichi M, et al. Differential effect of malnutrition between patients hospitalized with new-onset heart failure and worsening of chronic heart failure [J]. ESC Heart Fail, 2021, 8(3): 1819-1826

[9] Pranata R, Tondas AE, Yonas E, et al. Differences in clinical characteristics and outcome of de novo heart failure compared to

acutely decompensated chronic heart failure - systematic review and meta-analysis[J]. Acta Cardiol, 2021, 76(4): 410-420

[10] Pontremoli R, Borghi C, Perrone Filardi P. Renal protection in chronic heart failure: focus on sacubitril/valsartan [J]. Eur Heart J Cardiovasc Pharmacother, 2021, 7(5): 445-452

[11] 高敏,吴艺,高守君,等. 慢性心力衰竭患者血清 miR-30a、miR-101a 表达及其与心肌重构和心功能的相关性 [J]. 重庆医学, 2021, 50 (5): 762-766

[12] 中华医学会心血管病学分会, 中华心血管病杂志编辑委员会. 慢性心力衰竭诊断治疗指南. 中华心血管病杂志, 2007, 35(12): 1076-1095

[13] 国家心血管病医疗质量控制中心专家委员会心力衰竭专家工作组.2020 中国心力衰竭医疗质量控制报告[J].中国循环杂志, 2020, 36(3): 221-238

[14] Sweeney M, Cole GD, Pabari P, et al. Urinary drug metabolite testing in chronic heart failure patients indicates high levels of adherence with life-prolonging therapies [J]. ESC Heart Fail, 2021, 8 (3): 2334-2337

[15] Butler J, Djatche LM, Sawhney B, et al. Clinical and economic burden of chronic heart failure and reduced ejection fraction following a worsening heart failure event [J]. Adv Ther, 2020, 37(9): 4015-4032

[16] Cherneva R, Denchev S, Cherneva ZV. Autonomic dysfunction, cardio-pulmonary exercise testing and masked heart failure with preserved ejection fraction in non-severe chronic obstructive pulmonary disease [J]. Clin Physiol Funct Imaging, 2020, 40 (4): 224-231

[17] Nakao K, Horio T, Yoshimura R, et al. Long-term administration of tolvaptan ameliorates annual decline in estimated glomerular filtration rate in outpatients with chronic heart failure [J]. Heart Vessels, 2021, 36(8): 1175-1182

[18] Kobayashi M, Voors AA, Ouwerkerk W, et al. Perceived risk profile and treatment optimization in heart failure: an analysis from biology study to tailored treatment in chronic heart failure [J]. Clin Cardiol, 2021, 44(6): 780-788

[19] 汪言芬,于俊民,张小波,等. 心力衰竭患者心律失常发病机制研究进展[J]. 心肺血管病杂志, 2018, 37(9): 873-875

[20] Yan J, Pan Y, He Y, et al. The effects of serum iron level without anemia on long-term prognosis of patients with coronary heart disease complicated with chronic heart failure: a retrospective cohort study [J]. Heart Vessels, 2020, 35(10): 1419-1428

[21] Mamalyga ML, Mamalyga LM. Experimental study of heart functionality during treatment of chronic heart failure in rats of different age groups with levosimendan (experimental study)[J]. Bull Exp Biol Med, 2020, 169(1): 18-23

[22] 徐先静,黄改荣,段明勤,等.托伐普坦对老年慢性心力衰竭合并轻中度肾功能不全伴低钠血症患者的疗效及安全性[J].中华老年医学杂志, 2020, 40(3): 292-296

[23] Shpagina LA, Kamneva NV, Kudelya LM, et al. Diagnostic and prognostic markers of chronic heart failure in patients with occupational chronic obstructive pulmonary disease [J]. Kardiologiia, 2020, 60(7): 44-52

[24] Iyngkaran P, Thomas M, Majoni SW. Perspectives on optimizing chronic heart failure care beyond randomised controlled trials - what do we consolidate and how do we Plan for the future?[J]. Curr Cardiol Rev, 2019, 15(3): 158-160

[25] Yu DSF, Li PWC, Yue SCS, et al. The effects and cost-effectiveness of an empowerment-based self-care programme in patients with chronic heart failure: a study protocol [J]. J Adv Nurs, 2019, 75(12): 3740-3748

(上接第 4099 页)

[11] Wang J, Ji Y, Jiang L, et al. Analysis of factors influencing hospital-acquired infection in postoperative patients with intracranial aneurysm[J]. BMC Neurol, 2019, 19(1): 332

[12] Guo X, Fang J, Wu Y. Risk factors of intracranial infection in patients after intracranial aneurysm surgery: Implication for treatment strategies[J]. Medicine, 2021, 100(48): e27946

[13] Wang LY, Cao XH, Shi LK, et al. Risk factors for intracranial infection after craniotomy: A case-control study [J]. Brain Behav, 2020, 10(7): e01658

[14] Galli J, Morelli F, Rigante M, et al. Management of cerebrospinal fluid leak: the importance of multidisciplinary approach [J]. Acta Otorhinolaryngol Ital, 2021, 41(Suppl. 1): S18-S29

[15] 高晨琛, 黄荣, 常剑, 等.神经外科术后颅内感染影响因素及脑脊液 PCT 和 CXCL10 水平及其诊断价值[J].中华医院感染学杂志,2023, 33(3): 406-410

[16] Gong W, Wang XD, Liu YT, et al. Intracranial drainage versus extracranial shunt in the treatment of intracranial arachnoid cysts: a meta-analysis[J]. Childs Nerv Syst, 2022, 38(10): 1955-1963

[17] Sorinola A, Buki A, Sandor J, et al. Risk Factors of External Ventricular Drain Infection: Proposing a Model for Future Studies[J]. Front Neurol, 2019, 10(1): 226

[18] Garg K, Gupta D, Singh M, et al. Comparison of a bolt-connected external ventricular drain with a tunneled external ventricular drain - a narrative review and meta-analysis[J]. Neurosurg Rev, 2022, 45(2): 937-949

[19] 吉晓瑞, 李晓亮, 郑学军,等. 基于《外科正宗·脱疽论》探究下肢动脉硬化闭塞症的辨治[J]. 中国民间疗法, 2021, 29(20): 2-5

[20] 梁祥翰, 李钊, 陈德骏, 等.明清时期温散通托法治疗骨科术后感染探析[J].陕西中医, 2022, 43(9): 1263-1265

[21] Hottz ED, Quirino-Teixeira AC, Merij LB, et al. Platelet-leukocyte interactions in the pathogenesis of viral infections [J]. Platelets, 2022, 33(2): 200-207

[22] Zhai T, Fu ZL, Qiu YB, et al. Application of combined cerebrospinal fluid physicochemical parameters to detect intracranial infection in neurosurgery patients[J]. BMC Neurol, 2020, 20(1): 213

[23] Shahan B, Choi EY, Nieves G. Cerebrospinal Fluid Analysis [J]. Am Fam Physician, 2021, 103(7): 422-428

[24] Yoshihara T, Zaitsu M, Ito K, et al. Cerebrospinal Fluid Protein Concentration in Healthy Older Japanese Volunteers[J]. Int J Environ Res Public Health, 2021, 18(16): 8683

[25] Tahamtan A, Besteman S, Samadizadeh S, et al. Neutrophils in respiratory syncytial virus infection: From harmful effects to therapeutic opportunities[J]. Br J Pharmacol, 2021, 178(3): 515-530

[26] He Y, Liu J, Chen Y, et al. Neutrophil Extracellular Traps in Candida albicans Infection[J]. Front Immunol, 2022, 13: 913028

[27] Li Y, Min L, Zhang X. Usefulness of procalcitonin (PCT), C-reactive protein (CRP), and white blood cell (WBC) levels in the differential diagnosis of acute bacterial, viral, and mycoplasmal respiratory tract infections in children[J]. BMC Pulm Med, 2021, 21(1): 386