

不同性别不稳定型心绞痛患者血清中MHR和NLR与SYNTAX评分的相关性

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摘 要

目的: 探究不同性别不稳定型心绞痛患者中单核细胞/高密度脂蛋白胆固醇比值(MHR)和中性粒细胞与淋巴细胞比值(NLR)与SYNTAX评分的相关性。方法: 本研究纳入依据冠状动脉造影(CAG)检查并确诊为不稳定型心绞痛的患者400例。按照SYNTAX评分分为高危组和低危组, 并比较两组的年龄、高血压史、BMI、性别、糖尿病史、高血脂、冠心病/心衰、脑梗、吸烟、甘油三酯、总胆固醇、高密度脂蛋白、低密度脂蛋白、肌酐、尿酸、胱抑素C、白细胞、NLR、左室射血分数(LVEF)和MHR等。按照性别分组, 分别分析患者血清MHR和NLR与男女患者SYNTAX评分的相关性。基于多因素logistic回归方法分析影响男性不稳定型心绞痛患者SYNTAX评分的危险因素。受试者工作(ROC)曲线测试单独NLR与MHR及其联合预测不稳定型心绞痛患者SYNTAX评分高低。结果: SYNTAX评分高危组和低危组相比, 男性比例、吸烟史、尿酸、NLR、MHR、LVEF差异具有统计学意义。进一步把男性和女性患者分开分析发现, 男性不稳定型心绞痛患者中糖尿病史、高血脂、脑梗、吸烟、甘油三酯、尿酸、胱抑素、NLR、LVEF和MHR在SYNTAX评分低危和高危组存在统计学差异。女性患者中不同SYNTAX评分分级的显著差异指标有吸烟、肌酐和LVEF ($P < 0.05$)。多因素logistic回归结果表明吸烟、NLR、LVEF、MHR是影响男性不稳定型心绞痛患者SYNTAX评分的危险因素。NLR和MHR预测SYNTAX评分风险的ROC曲线下面积为0.645、0.728、0.759, 联合NLR与MHR预测效果优于单一指标。结论: MHR和NLR与男性不稳定型心绞痛患者SYNTAX评分相关, 联合NLR与MHR预测SYNTAX评分风险有一定价值。

关键词

不稳定型心绞痛, 单核细胞/高密度脂蛋白胆固醇比值(MHR), 中性粒细胞与淋巴细胞比值(NLR), SYNTAX评分

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Correlation of Serum MHR and NLR with SYNTAX Scores in Patients with Unstable Angina Pectoris of Different Genders

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Abstract

Objective: To investigate the correlation between MHR and NLR and SYNTAX score in patients with unstable angina pectoris (UA) of different genders. **Methods:** A total of 400 unstable angina pectoris patients were diagnosed by coronary angiography (CAG). The high-risk group and low-risk group were divided according to the SYNTAX score. Age, history of hypertension, BMI, gender, diabetes, hyperlipidemia, triglyceride, heart disease/heart failure, total cholesterol, cerebral infarction, smoking, high-and low-density lipoprotein, creatinine, uric acid, cystatin C, white blood cell, NLR, and high blood pressure were respectively collected and compared between high- and low-groups. The correlation between serum MHR and NLR and SYNTAX score of male and female patients was analyzed according to gender grouping. Multivariate logistic analysis was performed to detect the risk factors of SYNTAX score in male patients with unstable angina pectoris. Receiver operating (ROC) curve was used to analyze the SYNTAX score of patients with unstable angina pectoris predicted by NLR and MHR alone or in combination. **Results:** Male proportion, smoking history, uric acid, NLR, MHR, and LVEF were statistically significant between high- and the low-SYNTAX score group. In the further analysis, the history of diabetes, hyperlipidemia, cerebral infarction, smoking, triglyceride, uric acid, cystatin, NLR, LVEF and MHR were different in the low- and high-SYNTAX score groups in male UA patients. However, smoking, creatine, and LVEF ($P < 0.05$) were different in the low- and high-SYNTAX score groups in female UA patients. Multivariate logistic analysis revealed that LVEF, smoking, NLR, and MHR were risk factors affecting SYNTAX score of male UA patients. The area under ROC curve of NLR and MHR to predict SYNTAX score risk was 0.645, 0.728, 0.759, and the prediction effect of combined NLR and MHR was better than that of a single index. **Conclusions:** MHR and NLR are correlated with SYNTAX score in male patients with unstable angina pectoris, and the combination of NLR and MHR has certain value in predicting SYNTAX score risk.

Keywords

Unstable Angina Pectoris, Monocyte/High-Density Lipoprotein Cholesterol Ratio, Neutrophil to Lymphocyte Ratio, SYNTAX Score

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1. 前言

胸痛、胸闷，是急诊科最常见的主诉之一，主要的诊断考虑是急性冠状动脉综合征(Acute coronary syndrome, ACS)。ACS 是一种急性心肌梗死或缺血，通常由冠状动脉血流急性中断引起，是心血管疾病的危急症。包括不稳定型心绞痛(UA)、非 ST 段抬高型心肌梗死和 ST 段抬高型心肌梗死[1] [2]。不稳定型心绞痛是是心肌梗死最严重的和最致命的形式之一。

单核细胞/高密度脂蛋白胆固醇比值(MHR)是一个能反映机体炎症和免疫状态的标志物，据报道 MHR 与冠脉病变程度和心血管不良事件相关[3]。中性粒细胞与淋巴细胞比值(neutrophil to lymphocyte ratio, NLR)近年来成为研究冠心病的热点，NLR 可作为衡量机体炎症强度的指标，与冠心病严重程度呈正相关[4]。NLR 和 MHR 有助于区分 ACS 与稳定型心绞痛患者，且二者联合对于 ACS 的诊断均具有较高的敏感度和特异度，可用于 ACS 辅助诊断，具有较好的应用价值[5]。NLR 和 MHR 与冠状动脉病变的相关性已经被多个研究证实，是否有性别特异性，仍存在争议。SYNTAX 评分是一种基于病变的血管造影评分系统，可对冠状动脉疾病的复杂性进行评分，广泛用于量化冠状动脉疾病病变的严重程度，并预测不良的心血管后果[6]。本研究基于 SYNTAX 评分，探讨不稳定型心绞痛患者血清中 NLR 和 MHR 与冠状动脉病变的相关性是否具有性别特异性。

2. 资料与方法

2.1. 研究对象

本研究回顾性分析自 2021 年 1 月至 7 月于青岛大学附属医院心血管内科住院的 UA 患者 400 例，其中男性 240 例，女性 160 例，平均年龄(61.07 ± 9.23)岁。纳入标准：根据 2016 年诊断指南，入院时确诊为不稳定型心绞痛患者；在我院进行冠状动脉造影(Coronary angiography, CAG)检查、诊断为 UA，接受治疗的患者，CAG 结果由至少两名心血管内科副高职称及以上的医师进行判定；具有肝肾功以及各项生化指标结果的患者。排除标准：心肌病、先天性心脏病、严重心脏瓣膜病、心包疾病等患者；近日内发生过心肌梗死的患者；恶性肿瘤患者；肝肾功严重异常者。

2.2. 患者临床资料

记录患者的年龄、性别、身高、体重、高血压病、脑梗死、吸烟史、糖尿病史等。抽取患者空腹静脉晨血进行血常规和生化指标检测，包括：白细胞、中性粒细胞、淋巴细胞、单核细胞、总胆固醇、甘油三酯、低密度脂蛋白、高密度脂蛋白、尿酸、肌酐以及 CAG 结果。通过计算得出身体质量指数(Body Mass Index, BMI)、MHR、NLR 等指标以及超声心动图结果(左室射血分数 Left Ventricular Ejection Fraction, LVEF)。

2.3. 冠状动脉造影术

由 2 名经验丰富的主治医生及以上级别的心内科医师多体位观察冠状动脉血管情况。根据冠状动脉造影结果，依据网站(<http://www.syntaxscore.com>)计算 SYNTAX 评分，评分结果由 2 名主治或以上级别医师审核。

2.4. SYNTAX 评分分组

根据 SYNTAX 评分将 NSTEMI-ACS 组患者分成轻危(0~23)和高危病变组(≥ 23)，分析低危组和高危组基线资料之间的差别以及和 SYNTAX 评分相关的因素。

2.5. 统计分析

应用 SPSS 20.0 软件进行统计分析。计量资料采用 Shapiro-Wilk 法进行正态性检验，符合正态分布的

计量资料采用 $\text{mean} \pm \text{SD}$ 表示, 否则采用中位数和四位分数间距表示, t 检验或非参数法(Mann-Whitney Test)进行组间差异比较; 构成比的形式描述定性资料卡方检验或非参数检验分析组间差异。两变量的相关性分析, 采用 Pearson 相关分析(两变量均为正态分布)或 Spearman 相关分析。单因素分析有意义的变量纳入多因素 Logistic 回归, 双侧 $P < 0.05$ 说明有统计学差异。

3. 结果

3.1. SYNTAX 评分低危组和高危组基线资料比较

本研究根据纳入和排除标准纳入 400 例患者, 其中男性 240 例, 女性 160 例。SYNTAX 评分高危组的男性比例和吸烟史较低危组差异显著($P < 0.01$), 高危组的尿酸, NLR, MHR 显著高于低危组($P < 0.05$), SYNTAX 评分低危组的 LVEF 明显高于高危组($P < 0.01$)。年龄, BMI, 高血压, 高血脂, 冠心病, 脑梗, 甘油三酯, 总胆固醇, 低密度脂蛋白, 肌酐, 胱抑素, 白细胞在 SYNTAX 评分低危组和高危组无统计学差异(表 1)。

Table 1. Comparison of baseline data between low- and high-risk group for SYNTAX score
表 1. SYNTAX 评分低危组和高危组基线资料比较

变量	低危组(n = 187)	高危组(n = 213)	Z/t/X ²	P	
年龄	60.352 ± 7.659	61.353 ± 8.342	-1.546	0.109	
BMI	24.561 (22.470~27.231)	24.472 (22.542~27.301)	-0.764	0.465	
性别	女	96 (51.34%)	64 (30.00%)	28.902	0.000
	男	91 (48.66%)	149 (70.00%)		
高血压	无	78 (41.71%)	85 (39.91%)	0.895	0.339
	有	109 (58.29%)	128 (60.09%)		
糖尿病	无	119 (63.64%)	129 (60.56%)	0.682	0.441
	有	68 (36.36%)	84 (39.44%)		
高血脂	无	147 (78.61%)	161 (75.59%)	0.875	0.401
	有	40 (21.39%)	52 (25.82%)		
冠心病/心衰	无	140 (74.87%)	160 (75.12%)	0.205	0.742
	有	47 (25.13%)	53 (24.88%)		
脑梗	无	145 (77.54%)	156 (73.24%)	1.112	0.409
	有	42 (22.46%)	57 (26.76%)		
吸烟	无	170 (90.91%)	150 (70.42%)	42.460	0.000
	有	17 (9.09%)	63 (29.58%)		
甘油三酯(TG) (mmol/L)	1.410 (0.900~2.235)	1.481 (1.030~2.303)	-1.087	0.309	
总胆固醇(TC) (mmol/L)	4.324 (3.465~5.238)	4.512 (3.29~5.202)	-0.232	0.793	
低密度脂蛋白(LDL-C) (mmol/L)	2.398 (1.740~3.128)	2.562 (1.807~3.214)	-0.903	0.410	
肌酐(CR) (umol/L)	67.825 (54.541~77.782)	65.002 (56.823~81.902)	-0.089	0.945	
尿酸(UA) (umol/L)	322.000 (261.809~388.209)	350.000 (283.790~413.057)	-3.609	0.000	
胱抑素 C (Cys-C) (mg/L)	0.895 (0.798~1.029)	0.934 (0.800~1.110)	-1.798	0.064	

Continued

白细胞(WBC) ($10^9/L$)	6.960 (6.248~8.530)	7.208 (6.169~8.410)	-0.716	0.473
NLR	2.059 (1.499~2.842)	2.531 (1.898~3.340)	-6.009	0.000
LVEF (%)	60.024 (55.011~61.000)	58.670 (52.408~60.012)	-3.646	0.000
MHR	0.428 (0.297~0.549)	0.449 (0.348~0.578)	-3.023	0.002

3.2. 不同性别不稳定型心绞痛患者中 SYNTAX 评分分级的差异性分析

上述分析得出性别在 SYNTAX 评分低危组和高危组存在显著差异。为了进一步探索不同性别中影响 SYNTAX 评分的因素,按照性别分组,分别分析男性组和女性组中 SYNTAX 评分分级的差异性。结果如下,男性不稳定型心绞痛患者中糖尿病史,高血脂,脑梗,吸烟,甘油三酯,尿酸,胱抑素, NLR, LVEF 和 MHR 在 SYNTAX 评分低危组和高危组存在统计学差异(表 2)。表 3 显示了女性患者中不同 SYNTAX 评分分级的差异指标,其中吸烟,肌酐和 LVEF 存在统计学差异($P < 0.05$)。

Table 2. Difference analysis of SYNTAX score grading in male patients

表 2. 男性患者中 SYNTAX 评分分级的差异性分析

变量	低危组	高危组	Z/t/ X^2	P
年龄	61.602 ± 8.796	62.451 ± 9.125	-0.154	0.867
BMI	25.952 (24.040~28.265)	25.989 (23.867~28.612)	-0.400	0.689
高血压	无 91 (48.92%)	123 (41.84%)	2.317	0.128
	有 95 (51.08%)	171 (58.16%)		
糖尿病	无 133 (71.51%)	181 (61.56%)	4.976	0.026
	有 53 (28.49%)	113 (38.44%)		
高血脂	无 160 (86.02%)	221 (75.17%)	8.194	0.004
	有 26 (13.98%)	73 (24.83%)		
冠心病/心衰	无 147 (79.03%)	210 (71.43%)	3.456	0.063
	有 39 (20.97%)	84 (28.57%)		
脑梗	无 162 (87.10%)	212 (72.11%)	14.873	0.000
	有 24 (12.90%)	82 (27.89%)		
吸烟	无 153 (82.26%)	173 (58.84%)	28.664	0.000
	有 33 (17.74%)	121 (41.16%)		
甘油三酯(mmol/L)	1.285 (0.883~1.963)	1.480 (0.990~2.320)	-2.434	0.015
总胆固醇(mmol/L)	3.930 (3.338~4.823)	4.245 (3.335~5.140)	-1.209	0.227
低密度脂蛋白(mmol/L)	2.325 (1.695~2.943)	2.395 (1.750~3.090)	-0.700	0.484
肌酐(umol/L)	68.000 (62.000~77.000)	69.055 (59.970~81.085)	-0.335	0.738
尿酸(umol/L)	331.500 (279.250~401.135)	355.500 (288.500~425.250)	-2.466	0.014
胱抑素 C (mg/L)	0.880 (0.790~1.000)	0.930 (0.820~1.060)	-2.286	0.022
白细胞($10^9/L$)	7.050 (5.948~8.515)	7.055 (6.118~8.503)	-0.643	0.520
NLR	1.791 (1.427~2.465)	2.600 (1.967~3.376)	-8.555	0.000
LVEF (%)	60.000 (56.000~61.000)	58.780 (52.333~60.073)	-2.992	0.003
MHR	0.437 (0.300~0.556)	0.473 (0.375~0.610)	-5.901	0.000

Table 3. Difference analysis of SYNTAX score grading in female patients**表 3.** 女性患者中 SYNTAX 评分分级的差异性分析

变量	低危组	高危组	Z/t/X ²	P	
年龄	62.866 ± 9.011	64.448 ± 8.949	-1.684	0.092	
BMI	25.459 (23.386~27.608)	25.593 (23.394~27.610)	-0.095	0.924	
高血压	无	68 (36.17%)	44 (33.33%)	0.274	0.600
	有	120 (63.83%)	88 (66.67%)		
糖尿病	无	98 (52.13%)	70 (53.03%)	0.025	0.874
	有	90 (47.87%)	62 (46.97%)		
高血脂	无	128 (68.09%)	95 (71.97%)	0.554	0.457
	有	60 (31.91%)	37 (28.03%)		
冠心病/心衰	无	123 (65.43%)	92 (69.70%)	0.642	0.423
	有	65 (34.57%)	40 (30.30%)		
脑梗	无	121 (64.36%)	97 (73.48%)	2.972	0.085
	有	67 (35.64%)	35 (26.52%)		
吸烟	无	178 (94.68%)	124 (93.94%)	0.080	0.047
	有	10 (5.32%)	8 (6.06%)		
甘油三酯(mmol/L)	1.630 (0.990~2.483)	1.415 (1.065~2.073)	-0.935	0.350	
总胆固醇(mmol/L)	4.445 (3.623~5.468)	4.570 (3.520~5.273)	-0.003	0.998	
低密度脂蛋白(mmol/L)	2.475 (1.743~3.123)	2.545 (2.005~3.250)	-1.070	0.285	
肌酐(umol/L)	65.380 (51.393~79.295)	60.000 (49.000~75.600)	-1.629	0.103	
尿酸(umol/L)	322.915 (253.185~377.458)	339.425 (277.000~381.158)	-1.315	0.029	
胱抑素 C (mg/L)	0.915 (0.803~1.060)	0.925 (0.790~1.068)	-0.214	0.831	
白细胞(10 ⁹ /L)	7.110 (6.090~8.333)	7.325 (6.248~8.203)	-0.416	0.677	
NLR	2.440 (1.714~3.162)	2.385 (1.779~3.223)	-0.039	0.969	
LVEF (%)	59.405 (54.325~61.000)	58.795 (52.413~60.000)	-2.171	0.030	
MHR	0.410 (0.293~0.540)	0.398 (0.285~0.509)	-0.728	0.466	

3.3. 不同性别不稳定性心绞痛患者的 SYNTAX 评分相关性分析

男性患者 SYNTAX 评分与高血脂、糖尿病、脑梗、吸烟、甘油三酯、尿酸、胱抑素 C、NLR 和 MHR 正相关，而 LVEF(%)与 SYNTAX 评分呈反相关。在女性患者中，SYNTAX 评分与吸烟和尿酸正相关，与 LVEF 负相关(表 4)。男性患者中，SYNTAX 评分有更多的相关因素，下一步进一步探讨在男性中血管狭窄的危险因素。

Table 4. Correlation analysis of SYNTAX scores for men and women patients**表 4.** 男性和女性患者的 SYNTAX 评分相关性分析

变量	男性		女性	
	R	P	R	P
年龄	0.023	0.580	0.046	0.453
BMI	0.032	0.435	-0.036	0.542
高血压	0.049	0.210	-0.001	0.990

Continued

糖尿病	0.124	0.005	0.026	0.661
高血脂	0.169	0.000	-0.028	0.619
冠心病/心衰	0.138	0.002	-0.028	0.639
脑梗	0.205	0.000	-0.075	0.149
吸烟	0.230	0.000	0.029	0.044
甘油三酯(mmol/L)	0.145	0.002	-0.015	0.827
总胆固醇(mmol/L)	0.058	0.209	-0.021	0.669
低密度脂蛋白(mmol/L)	0.036	0.433	0.028	0.602
肌酐(umol/L)	-0.003	0.960	-0.083	0.110
尿酸(umol/L)	0.140	0.002	0.093	0.044
胱抑素 C (mg/L)	0.126	0.005	0.006	0.891
白细胞($10^9/L$)	0.038	0.387	0.066	0.228
NLR	0.389	0.000	0.039	0.424
LVEF (%)	-0.152	0.000	-0.161	0.004
MHR	0.189	0.000	0.000	0.985

3.4. 男性患者中血管狭窄的危险因素

根据差异性检验结果和相关性结果,对有意义的变量纳入 logistic 回归,结果显示吸烟, NLR, LVEF, MHR 是影响男性不稳定心绞痛患者 SYNTAX 评分的危险因素(表 5)。

Table 5. Analysis of risk factors for vascular stenosis in male patients

表 5. 男性患者中血管狭窄的危险因素分析

变量	B	S.E.	Wald	P	OR (95%CI)
高血脂	0.619	0.370	2.943	0.079	1.850 (0.910~3.792)
吸烟	0.849	0.301	8.024	0.005	2.401 (1.305~4.303)
NLR	0.869	0.148	31.142	0.000	2.400 (1.769~3.302)
LVEF	-0.040	0.016	5.6904	0.018	0.957 (0.930~0.989)
MHR	2.242	0.769	8.418	0.038	9.392 (2.069~41.870)
常数	4.602	1.340	11.792	0.001	97.301

3.5. 男性不稳定心绞痛患者 ROC 曲线预测价值

绘制 ROC 曲线,得到 NLR 和 MHR 预测 SYNTAX 评分的曲线下面积(AUC),分析显示(表 6),相比单独 NLR 和 MHR 预测男性不稳定性心绞痛 SYNTAX 评分,联合 NLR 与 MHR 预测效果的 AUC,灵敏度,特异性等优势显著($P < 0.01$)。

Table 6. Efficacy of MHR and NLR in predicting the SYNTAX score

表 6. MHR 和 NLR 预测男性不稳定性心绞痛 SYNTAX 评分的效能

变量	曲线下面积	标准误	P	95%CI	Cut-off	敏感度	特异度
MHR	0.645	0.024	0.000	0.590~0.711	0.358	0.807	0.420
NLR	0.728	0.022	0.000	0.685~0.780	2.101	0.689	0.668
MHR + NLR	0.759	0.021	0.000	0.724~0.808	0.638	0.646	0.771

4. 讨论

不稳定性心绞痛发病急,病情发展快,相当一部分患者经过常规治疗后仍面临不良后果风险。明确的诊断,准确的危险分层和挖掘可靠的生物标志物来预测疾病风险,可有效的改善不稳定性心绞痛患者临床结局。

动脉粥样硬化是不稳定心绞痛的病理基础,内皮和内膜损伤导致炎症反应,在炎症因子的触发下,单核细胞转移到血管内膜分化为巨噬细胞摄取脂质构成了粥样硬化斑块的一部分[7][8]。多个报道表明单核细胞与动脉粥样硬化相关疾病有关,可以预测心血管事件[7][9][10]。Nozawa 等人分析了 90 例急性心肌梗死患者在急性期和随访 7 个月时血管内超声结果,发现单核细胞计数越多,斑块体积变化越大,多因素分析显示住院期间单核细胞计数峰值可预测斑块进展[11]。高密度脂蛋白胆固醇(HDL-C)可促进血液循环,清除周围细胞以及动脉粥样硬化斑块中的胆固醇,运到肝脏再循环或者分解为胆酸排泄掉[12][13]。HDL-C 可阻止单核细胞分化的巨噬细胞聚集和迁移,抑制胆固醇外排,进而中和单核细胞促炎和促氧化作用,从而起到抗动脉粥样硬化的效果[12]。炎症疾病中常出现单核细胞增加和 HDL-C 降低,同时高单核细胞低 HDL-C 也参与了动脉粥样硬化和心血管疾病[14][15]。MHR 将单核细胞计数与 HDL-C 水平整合为单一风险因素,被广泛用来预测冠状动脉病变程度[16][17]。Oylumlu M 等人发现 MHR 和淋巴细胞/单核细胞比值可以预测急性冠脉综合征的长期死亡率[18]。MHR 不光与心脑血管疾病死亡率升高相关,对一般人群死亡率也有一定的预测价值[19]。

NLR 代表了两个相反但互补的免疫途径的比率,是一种廉价且容易获得的广泛使用的炎症标志物,NLR 值越高意味着机体炎症反应越剧烈[20][21]。NLR 值可以预测急性冠脉综合征患者的心律失常以及短期和长期的死亡率,与 GRACE 和 SYNTAX 评分有很好的相关性[22][23]。此外,与白细胞总数在冠心病中的预测价值相比,NLR 值的预测价值更优,与超敏 C 反应蛋白相当[24]。在一项非 ST 段抬高急性冠脉综合征研究中,高 NLR 值与高 SYNTAX 评分显著相关[25]。Arbel 等人分析了 3005 例接受冠状动脉造影患者的全血细胞计数,结果显示 NLR 与冠心病严重程度和 3 年预后独立相关[26]。NLR 被广泛用于 ACS 诊断的辅助生物标志物[27][28][29]。

目前已有多个研究探索 MHR, NLR 与 SYNTAX 评分的相关性。Akboga 等学者把 1229 例冠状动脉疾病患者分为高和低 SYNTAX 评分组,高 SYNTAX 评分组 MHR 显著增高, MHR 与 SYNTAX 评分呈显著正相关,是预测 SYNTAX 评分高的一个独立变量[30]。Kundi 等学者的研究也发现类似结果,即 MHR 与稳定性冠心病和 ACS 患者的 SYNTAX 评分成正相关[31]。本研究发现 MHR 和 NLR 在 SYNTAX 评分低分组和高分组存在显著差异,并且和 SYNTAX 评分显著相关。分开探讨 MHR 和 NLR 在不同性别中与 SYNTAX 评分相关性发现, MHR 和 NLR 与 SYNTAX 评分的相关性具有性别特异性,在男性不稳定性心绞痛患者中 MHR 和 NLR 是 SYNTAX 评分的独立危险因素,而在女性患者中无显著相关性。和 Xu 等人的研究结果一致, MHR 与 SYNTAX 评分仅在男性稳定的冠心病患者存在正相关关系,仅对男性稳定的冠心病患者的高 SYNTAX 评分有预测价值[32]。Pan 等学者发现 NLR 与男性冠状动脉疾病患者的 SYNTAX 评分相关,是男性冠心病的独立危险因素和预测因子,而与女性无关[33]。由于男性和女性在性激素、免疫反应特征方面存在差异,不同性别的冠心病患者的表现、性激素、免疫反应特征、风险因素等差异很有可能导致 MHR、NLR 的性别差异。

5. 结论

综上所述, MHR 和 NLR 与不稳定性心绞痛患者 SYNTAX 评分相关,二者联合分析对预测动脉病变程度有重要意义。

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