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红细胞分布宽度血小板比率和中性粒细胞淋巴细胞比率在急诊 PCI 术后冠脉无复流评估中的应用价值 *

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摘要 目的:探讨红细胞分布宽度血小板比率(RDW)和中性粒细胞淋巴细胞比率(NLR)预测急诊经皮冠状动脉介入(PCI)术后冠脉无复流的应用价值。**方法:**选取 2016 年 1 月~2016 年 12 月于我院行急诊 PCI 手术治疗的患者 66 例为研究对象,检测其治疗前的 RDW 和 NLR,统计其急诊 PCI 术后冠脉无复流现象的发生情况,比较冠脉无复流和正常血流患者的 RDW 和 NLR,分析患者 RDW 和 NLR 与其冠脉无复流的关系及其对冠脉无复流的预测价值。**结果:**66 例患者急诊 PCI 术后冠脉无复流发生率为 30.30%(20/66)。与正常血流患者比较,冠脉无复流患者 RDW 和 NLR 均升高($P<0.05$)。Spearman 相关分析结果显示患者 RDW 和 NLR 与其冠脉无复流均呈正相关($r=0.826, 0.878, P<0.05$)。进一步 ROC 曲线分析结果显示急诊 PCI 术前 RDW 和 NLR 联合预测其术后冠脉无复流的 ROC 曲线下面积高于二者单独预测。**结论:**急诊 PCI 患者 RDW 和 NLR 与其术后冠脉无复流密切相关且两者联合预测患者术后冠脉无复流的价值良好,可能作为急诊 PCI 术后冠脉无复流评估的参考指标。

关键词:红细胞分布宽度血小板比率;中性粒细胞淋巴细胞比率;急诊经皮冠状动脉介入;冠状动脉;无复流

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Clinical Value of Platelet Distribution Width Ratio and Neutrophil Lymphocyte Ratio in the Evaluation of Coronary No-Reflow in Patients Treated by Emergency PCI*

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ABSTRACT Objective: To investigate the clinical value of platelet distribution width ratio (RDW) and neutrophil lymphocyte ratio (NLR) in the prediction of coronary no reflow in patients treated with acute percutaneous coronary intervention (PCI). **Methods:** 66 patients underwent emergency PCI treatment in our hospital from January 2016 December 2016 were selected as the research object, RDW and NLR of the patients before treatment were detected, and coronary no reflow phenomenon after emergency PCI rate were statistically calculated. RDW and NLR of patients with no reflow and normal blood flow were compared, the relationship between RDW and NLR with no reflow and the value of them predicting coronary no reflow were analyzed. **Results:** The incidence of coronary no reflow after emergency PCI was 30.30% (20/66). Compared with patients with normal blood flow, the RDW and NLR of patients with coronary no reflow were elevate ($P<0.05$). Spearman correlation analysis results showed that RDW and NLR were positively correlated with coronary no reflow ($r=0.826, 0.878, P<0.05$). Further ROC curve analysis showed that AUC of preoperative RDW combined with NLR predicting the postoperative coronary no reflow in patients treated with emergency PCI were higher than RDW and NLR alone. **Conclusion:** RDW and NLR in patients treated with emergency PCI were closely related to the postoperative coronary no reflow, which might be used as reference index for evaluation of coronary no reflow after emergency PCI.

Key words: Red blood cell distribution width platelet ratio; Neutrophil lymphocyte ratio; Emergency percutaneous coronary intervention; Coronary artery; No reflow

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前言

冠状动脉狭窄是临床常见病症,经皮冠状动脉介入(Percu-

taneous coronary intervention, PCI)是其常用的治疗方法,其适用范围相对较大,可快速有效地缓解患者的冠状动脉狭窄从而恢复患者心脏血供和氧供,改善心脏的泵血功能,缓解患者的

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胸痛、心悸等临床症状^[1-3]。然而,冠状动脉狭窄往往起病急,需行急诊 PCI 治疗,而术后冠脉再通时可能发生无复流而导致治疗失败^[4]。因此,早期评估急诊 PCI 术后冠脉无复流从而指导临床积极采取措施干预具有重要意义。

冠脉狭窄患者的红细胞分布宽度、血小板、中性粒细胞淋巴细胞比率(neutrophil lymphocyte ratio, NLR)等均可出现明显的异常,且与病情相关^[5,6]。上述指标可能反映冠脉狭窄病情及其治疗困难情况,与急诊 PCI 术后冠脉无复流相关。然而,目前关于红细胞分布宽度血小板比率(platelet distribution width ratio, RDW)和 NLR 与急诊 PCI 术后无复流的关系尚不明确。因此,本研究检测了行急诊 PCI 治疗患者的 RDW 和 NLR,分析了其 RDW 和 NLR 与其冠脉无复流的关系及两者单独和联合预测急诊 PCI 术后冠脉无复流的价值,旨在寻找检测操作简单且可有效早期预测急诊 PCI 术后冠脉无复流的指标,从而指导临床对急诊 PCI 术后冠脉无复流进行防治以期改善疗效,结果报道如下。

1 资料与方法

1.1 一般资料

选取 2016 年 1 月~2016 年 12 月于我院行急诊 PCI 手术治疗患者 66 例为研究对象,纳入标准:为我院收治的初发急性冠脉综合征患者,在发病后 6h 内入院治疗并拟在发病后 12 h 内行急诊 PCI 手术治疗,性别年龄不限;排除标准:合并其他心脏疾病,PCI 术前经溶栓治疗患者、合并感染性疾病、血液系统疾病、恶性肿瘤或其他脏器严重内科疾病等患者。最终纳入急诊 PCI 手术治疗患者 66 例,其中男 38 例,女 28 例,年龄 39 岁~78 岁,平均年龄(63.35±11.48)岁,合并糖尿病 35 例,合并高血压 40 例,合并高血脂血症 38 例,吸烟 42 例,饮酒 48 例,身体质量指数 19.66 kg/m²~39.44 kg/m²,平均身体质量指数(29.96±6.78) kg/m²。研究符合伦理学标准并经本院伦理学委员会审核和批准,且入选患者均知情同意并签署了知情同意书。

1.2 治疗方法

患者均在发病后 12 h 内行急诊 PCI 手术,术前向患者及其家属耐心解释手术的过程及其可能出现的反应,让患者及其家属了解实验过程及其可能不良反应情况,并签署知情同意书。术前常规进行冠脉造影了解患者冠状动脉狭窄部位和情况,根据检测结果进行手术操作。手术时患者均采用仰卧位,手臂外展平伸,常规进行穿刺部位的消毒,铺巾,采用 1%的利多

卡因常规进行局部麻醉,穿刺左侧桡动脉,插入短引导丝和 6F 动脉鞘,经外鞘管注入肝素钠 2500 U 以抗凝,对于冠脉官腔直径 75%以上均狭窄的患者行血流重建,给予 PTCA 和 Stelling 术治疗,置入支架前静脉追加 50 U 的普通肝素进行抗凝,其后术中每小时均经静脉追加 1000 U 的普通肝素进行抗凝,选择合适的球囊导管并经鞘管送入冠状动脉开口处进行温和,将导丝推送通过狭窄处,达冠状动脉狭窄的远端,沿该导丝将球囊送入病变处进行预扩张,选择合适的药物支架,将药物涂层的支架转却放入狭窄部位。进一步以 10~12 mmHg 的大气压扩张球囊,释放支架,退出球囊,再次进行冠脉造影检查确定支架置放情况及冠脉血流情况,确定病变狭窄部位官腔明显较之前增大、无夹层、支架铁壁良好,退出导丝和动脉鞘,进行穿刺部位的常规压迫止血和消毒处理。

1.3 观察指标和检测方法

患者均在入院后马上抽取外周血 3 mL 进行,置于含 0.109 mol/L 枸橼酸钠抗凝剂真空管中,采用日本东亚 K-4500 全自动血细胞分析仪测定红细胞分布宽度、血小板计数、中性粒细胞计数以及淋巴细胞计数,并计算 RDW 与 NLR。以 PCI 术后梗死相关动脉无残余狭窄且无远端血栓,心肌梗塞溶栓治疗(thrombolysis in myocardial infarction, TIMI) 血流≤2 级为冠脉无复流标准,统计研究对象急诊 PCI 术后冠脉无复流现象的发生情况。

1.4 统计学分析

采用 SPSS19.0 软件,计量资料均符合正态分布,并采用两独立样本均数 t 检验进行组间比较,采用 Spearman 无条件相关分析法分析急诊 PCI 患者 RDW 和 NLR 与其冠脉无复流的关系,并采用受试者操作特性曲线(Receiver operating characteristic curve, ROC)分析急诊 PCI 患者 RDW 和 NLR 对冠脉无复流的预测价值,P<0.05 为差异有统计学意义。

2 结果

2.1 急诊 PCI 术后冠脉无复流的发生情况

66 例患者急诊 PCI 术后,冠脉无复流 20 例,冠脉血流正常 46 例,冠脉无复流发生率为 30.30%(20/66)。

2.2 冠脉无复流和正常血流患者的 RDW 和 NLR 比较

与正常血流患者比较,冠脉无复流患者 RDW 和 NLR 均显著升高,差异有统计学意义(P<0.05),见表 1。

表 1 冠脉无复流和正常血流患者的 RDW 和 NLR 比较(比值)

Table 1 Comparison of the RDW and NLR of patients with no reflow and normal blood reflow (ratio)

Coronary artery reflow	Cases	RDW	NLR
No reflow	20	11.87±3.35	6.98±1.25
Normal blood reflow	46	4.62±1.48	5.12±0.96

2.3 急诊 PCI 术前 RDW 和 NLR 与其冠脉无复流的关系

Spearman 相关分析结果显示:患者 RDW 和 NLR 与其冠脉无复流均呈正相关($r=0.826, 0.878, P<0.05$)。

2.4 急诊 PCI 术前 RDW 和 NLR 预测其冠脉无复流的价值分析

进一步 ROC 曲线分析结果显示,急诊 PCI 术前 RDW 和

NLR 预测其术后冠脉无复流的敏感度、特异度、准确性均较高,其中以两者联合预测其术后冠脉无复流的敏感度、特异度、准确性最高,ROC 曲线下面积高于 RDW 和 NLR 单用,见表 2。

3 讨论

近年来,随着人们生活方式的改变以及人口老龄化的加

表 2 急诊 PCI 术前 RDW 和 NLR 预测其冠脉无复流的价值

Table 2 Clinical value of preoperative RDW and NLR for predicting the no-reflow of coronary

Factors	Cutoff value	Area under curve	Sensitivity	Specificity	Accuracy
RDW	11.02	0.693	85.00%	86.96%	86.36%
NLR	6.73	0.625	80.00%	82.61%	81.82%
RDW+NLR	11.13+6.84	0.878	95.00%	93.48%	93.94%

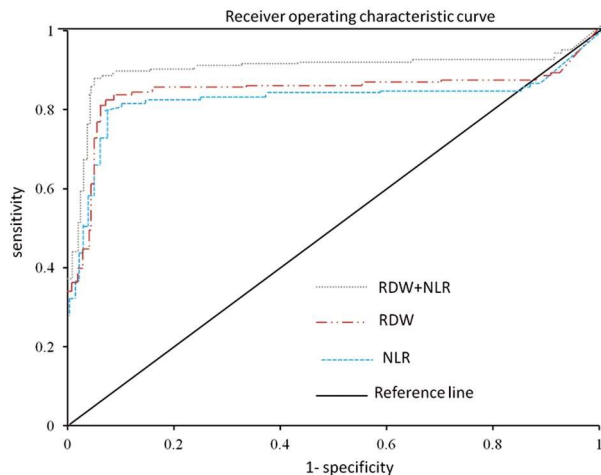


图 1 急诊 PCI 术前 RDW 和 NLR 预测其冠脉无复流的 ROC 曲线

Fig.1 ROC curves of preoperative RDW and NLR in patients treated with emergency PCI predicting coronary artery no reflow

速,各类心血管疾病的发生率不断升高^[7,8]。冠脉血管狭窄是常见心血管疾病症状,溶栓治疗为其常用治疗方法,但其治疗效果和适用范围有限。PCI 可快速有效缓解冠脉狭窄,恢复心脏血供,有助于心功能乃至预后的改善^[9-15]。冠脉血管狭窄起病急,病情进展快,常需行急诊 PCI 手术治疗,而 PCI 术后可见无复流的发生,且无复流是影响 PCI 治疗效果的重要影响因素^[16-22]。本研究探讨了急诊 PCI 术后冠脉无复流发生状况,结果显示:急诊 PCI 术后冠脉无复流发生率高达 30%以上,这较王佐岩等人^[23]的研究结果中的 24%的急诊 PCI 术后冠脉无复流发生率稍高,但略低于 Sanatkar 等人^[24]的 37.1%的 PCI 术后冠脉无复流发生率,这可能与本研究与其他研究的操作者技术、患者病情、样本量等差异有关。急诊 PCI 术后冠脉无复流发生高,可明显影响手术治疗效果。因此,对急诊 PCI 术后冠脉无复流进行有效的防治十分重要。

已有研究表明 PCI 术后冠脉无复流可能与毛细血管栓塞有关^[25-27]。而红细胞分布宽度、血小板均与凝血和血栓密切相关,中性粒细胞、淋巴细胞比率亦与毛细血管白细胞栓塞异相关^[29-31]。因此,上述指标均可能与急诊 PCI 术后冠脉无复流相关。然而,目前关于 RDW 和 NLR 与急诊 PCI 术后无复流的关系尚不明确。因此,本研究检测了急诊 PCI 治疗患者术前的 RDW 和 NLR,分析了其 RDW 和 NLR 与其冠脉无复流的关系,并分析了 RDW 和 NLR 预测急诊 PCI 术后冠脉无复流的价值。本研究结果显示:需行急诊 PCI 治疗患者的 RDW 和 NLR 均升高,其患者本身存在 RDW 和 NLR 水平的异常,而冠脉无复流患者 RDW 和 NLR 均较正常血流患者升高,提示其 RDW 和 NLR 可能与冠脉无复流的发生相关。进一步的 Spearman 无条件相关分析结果显示急诊 PCI 治疗患者 RDW

和 NLR 与其冠脉无复流均呈正相关,急诊 PCI 术前 RDW 和 NLR 可反映其术后冠脉无复流风险,可能用于其术后冠脉无复流的早期评估。进一步 ROC 曲线分析结果显示急诊 PCI 术前 RDW 和 NLR 预测其术后冠脉无复流的价值均良好,其中以两者联合预测其术后冠脉无复流的价值最优,急诊 PCI 术前出现 RDW 高于 11.13 和 NLR 高于 6.84 时需警惕其术后冠脉无复流的发生,及时调整治疗策略,改用其他有效治疗方法或尽可能推迟 PCI 治疗时间,减少急诊 PCI 术后冠脉无复流的发生,减少冠脉无复流对急诊 PCI 治疗的影响,以期改善疗效和预后。

本研究首次比较了 RDW 和 NLR 水平用于急诊 PCI 术后冠脉无复流评估的价值,因研究相关指标检测简单且费用低廉,各医院均可实施检测,易于被患者接收,可以较小的检测支出达到早期预知冠脉无复流从而尽早干预,减少冠脉无复流及其相关治疗费用,经济效益良好。然而,本研究的样本量偏小,研究样本取样具有地域性,且研究治疗和检测操作者技术水平也可能影响研究结果。因此,后续相关研究需尽可能进行多中心大样本量研究,且对检测者和手术者资质进行严格要求,以最大限度保障研究结果的准确性,指导临床进行急诊 PCI 干预,以期改善疗效和预后。

综上所述,急诊 PCI 患者 RDW 和 NLR 联合预测患者术后冠脉无复流的价值良好,可能用于急诊 PCI 术后冠脉无复流评估。

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