

NLR与脑梗死颈动脉斑块关系的研究进展

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摘 要

颈动脉斑块的形成和脑梗死密切相关, 而炎症指标参与了颈动脉斑块的形成, 近年来, NLR (中性粒细胞与淋巴细胞比值)作为研究炎症指标参与了心脑血管疾病、呼吸系统疾病等的研究, 然而NLR与脑梗死颈动脉斑块关系的研究繁杂, 故而对NLR与脑梗死颈动脉斑块的关系展开综述, 为脑梗死的防治提供借鉴依据。

关键词

中性粒细胞与淋巴细胞比值, 脑梗死, 颈动脉斑块, 动脉粥样硬化

Advances in the Relationship between NLR and Carotid Plaques in Cerebral Infarction

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Abstract

Carotid plaque formation and cerebral infarction are closely related, and inflammatory indicators are involved in the formation of carotid plaque. In recent years, NLR (neutrophil-to-lymphocyte ratio), as a study of inflammatory indicators, has been involved in cardiovascular and cerebrovascular diseases, respiratory diseases, etc., However, the study of the relationship between NLR and carotid plaques of cerebral infarction is cumbersome, so a review of the relationship between NLR and carotid plaques of cerebral infarction was carried out to provide reference basis for the prevention and treatment of cerebral infarction.

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Keywords

NLR (Neutrophil-to-Lymphocyte Ratio), Cerebral Infarction, Carotid Plaque, Atherosclerosis

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1. NLR 的概述

中性粒细胞和淋巴细胞作为白细胞的主要类型, 它们分别代表了两个重要的炎症成分, 并且易于从患者血液样本中提取, 同时具备成本较低、速度快的优势[1]。其中, 中性粒细胞可以刺激炎症物质的生成并释出, 吸引免疫系统参与, 而淋巴细胞则负责免疫系统的辨识任务, 同样在炎症过程中发挥关键角色[2] [3]。因此, 通过计算 NLR (即外周血中的中性粒细胞/淋巴细胞比例), 我们可以获得更为全面的信息来评估患者的炎症状况, 这使得它成为了近年来的热门研究领域。有报道 NLR 在癌症、心脑血管疾病、肾脏疾病、呼吸系统疾病[4] [5] [6] [7]等研究中都起到了重要作用。

2. NLR 与颈动脉粥样硬化斑块

尽管尚未完全理解全身循环系统中的常见病症 - 动脉粥样硬化的发生原理, 但我们已经了解到其中的部分因素可能是由免疫系统的应答引起的。这种现象涉及到两种主要类型的白血球: 即具有吞噬功能的中性粒细胞与负责调节机体防御能力的功能性的 T-cells (包括 B-cells)等其他类型。这些不同种类的血液成分之间存在着相互影响的关系: 例如, 受损害或破损的人类皮肤表面的微小伤口可以吸引大量的细菌入侵者进入人体组织内部引发感染症状的发生过程就是一个典型的例子。血小板也可与中性粒细胞互相作用, 引发中性粒细胞胞外陷阱释放[8] [9], 可促进血栓形成, 加快动脉粥样硬化。淋巴细胞可分为 B 淋巴细胞和 T 淋巴细胞, 它们对动脉粥样硬化的作用不同, B 淋巴细胞根据分型的不同, 对动脉粥样硬化既有保护作用[10] [11], 又有促进作用。T 细胞亚型也是有着各自的作用, Treg 细胞可是斑块回缩, 降低动脉粥样硬化的效应。与之不同的是, TH1 细胞可以使巨细胞活化及单核细胞聚集[12] [13]; TH17 细胞则可加快动脉粥样硬化的演变[14]。总的来说, 淋巴细胞对于防止动脉粥样硬化起着关键作用。campbell 等人的研究揭示, 少量的淋巴细胞可能会加速动脉粥样硬化的进展[15]。相较于两个单一的指标, NLR 整合了二者的优势, Nam KW [16]等人的研究显示高 NLR 与颅内动脉粥样硬化相关, Corrire 等人[17]的研究表明 NLR 在一定程度上是可作为预测颈动脉粥样硬化斑块多少和是否存在的指标。Meng [18]的研究认为 NLR 的升高与颈动脉内膜的增厚有很强的相关性。根据 Kouklu 的研究[19], 他们运用多元回归分析方法来探究颈动脉狭窄患者的临床表现和相关因素, 结果显示当 NLR 超过 2.6 时, 其可作为颈动脉狭窄发生病症的一个独立指标。此外, 也有一些研究[20] [21]指出, NLR 不仅与颈动脉狭窄手术后的恢复情况有密切关系, 还可能影响到那些没有明显症状但接受了支架治疗的颈动脉狭窄患者术后再次狭窄的风险。有一项回顾性研究显示 NLR 可作为颈动脉粥样硬化的独立预测因子[22]。

3. NLR 与脑梗死的相关性

炎症反应是脑梗死的主要病理机制之一, 研究表明中性粒细胞在脑梗死的炎症过程中扮演了关键角色[23] [24]。脑梗死后, 中性粒细胞会透过破坏的血脑屏障到达缺血梗死区[25], 中性粒细胞对脑梗死的负面作用有释放众多炎症因子加重脑损伤[26] [27], 加速血栓形成等。有研究[28]显示急性脑梗死眩晕组

的 NLR 明显高于非急性脑梗死, 故 NLR 可识别早期的脑梗死, 从而可为早期的脑梗死病因治疗提供依据。同样, 另一项研究表明脑梗死患者的 NLR 要高于短暂性脑缺血患者[29]。Kocaturk 等[30]的研究认为 NLR 与脑梗死的面积有相关性, 并且 NLR 对脑梗死的进展和严重程度有预测作用, 以及 NLR 是脑梗死死亡率的独立预测因子, 所以 NLR 可以作为评估急性脑梗死患者死亡风险的指标。Tokgoz 等[31]的研究也关心到了脑梗患者短期死亡率的问题, 研究的结论认为入院时的 NLR 与脑梗死患者的短期死亡率相关。脑梗死的预后也是人们所关心重点之一, NLR 与脑梗死短期预后不良增加有关[32], 同样有研究发现, 脑梗死患者 3 个月时的预后与入院时的 NLR 呈负相关[33]。静脉溶栓是我们治疗急性脑梗死的有效手段, 静脉溶栓时常会出现的一个并发症是症状性脑出血, 就有研究评估了 NLR 与症状性脑出血的关系, 显示出 NLR 可以预测溶栓后脑出血的发生[34] [35], 无脑出血患者的 NLR 要明显低于症状性脑出血患者[36]。此外, NLR 在评估早期功能恶化的静脉溶栓患者中具有很高的价值[37]。另一项针对脑梗死静脉溶栓的研究中, 研究人员发现 NLR 值升高与 3 个月的预后不良及脑实质出血风险有关[38]。血管内介入治疗也是治疗急性脑梗死的重要手段之一, 出血是其最常见的并发症, Inanc 的研究取栓患者发生脑出血后的 NLR 较高[39], 另一项研究中显示 NLR 可作为取栓后脑出血风险的独立预测因子[40]。因此, 对于急性脑梗死患者, 无论是在静脉溶栓或者在血管内介入治疗的研究, NLR 都有很大的价值。一个影响卒中患者预后的因素是感染, 特别是在卒中后出现肺炎的情况较为常见。动物实验结果显示, NLR 与卒中后感染的发生率呈正相关[41], 这可能是由于血液中抗炎反应导致免疫系统对抗菌活性下降[42]。NLR 也与脑梗死后早期谵妄有关系, 研究显示脑梗死后无谵妄人群的 NLR 低于出现谵妄的人群[43], 由此, 可将 NLR 作为评估谵妄的潜在生物标志物。卒中后抑郁的人群很多, 有研究表示相比健康人群及非卒中后抑郁人群, 卒中后抑郁的 NLR 明显是升高的[44], 其可能的机制是全身免疫系统的过度反应引起[45]。Xue 等[46]的研究表明 NLR 值和急性脑梗死的复发有明显的相关性, 危险比为 1.499。脑梗死的住院费用也是很多人关心的问题, Zhao 等[47]的研究表明 NLR 的升高是脑梗死患者住院费用的独立预测因子, 因此, 可用 NLR 评估脑梗死患者的住院花费。

4. 总结

综上所述, NLR 作为一个指标在颈动脉斑块形成, 数量多少, 以及预测颈动脉是否狭窄上均扮演了十分重要的角色, 而且和脑梗死关系密切, 尤其是其在静脉溶栓和血管内治疗后的出血转化方面的预测, 可以帮助我们早期进行预防和干预, 为更精准的治疗提供了研究思路, 但还需要更多的临床研究和试验来验证, 同时, 由于脑梗死有很高的致残、致死特性, 所以 NLR 与脑梗死患者的短期及长期预后方面的研究能够更好地帮助我们进行治疗的选择, 从而能延长患者生存质量。虽然 NLR 被发现与卒中后的感染、抑郁症及谵妄症状有关联, 这也表明它可能成为一种有潜力的脑梗死标记物。然而, 现阶段对 NLR 与不同类型的脑梗死(如 TOAST 分类)之间关系的探讨仍然有限, 因此我们急需更多相关的研究去揭示这些关联。总的来说, 尽管已有的一些研究已经在探索 NLR 与脑梗死颈动脉斑块之间的联系上取得进步, 但我们还需要更深层次的研究以全面了解其在脑梗死中的功能原理, 从而为我们寻找更好的防治策略提供新颖的视角和手段。

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