·论著·

微栓子信号在评价抗血小板药治疗中的作用初步探讨

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【摘要】 **目的**　初步探讨微栓子信号(microembolic signals, MES)监测在评价急性缺血性脑血管病患者抗血小板药或抗血小板药与他汀类药物联合应用中的价值。**方法**　行 MES 监测的急性颈动脉系统缺血性脑血管病患者中,MES 阳性者随机分为双联抗血小板组(阿司匹林 100 mg/d + 氯吡格雷 75 mg/d)和双联抗血小板与阿托伐他汀联用组(阿司匹林 100 mg/d + 氯吡格雷 75 mg/d + 阿托伐他汀 20 mg/d)。经颅多普勒超声监测 MES。**结果**　在60 例急性颈动脉系统缺血性脑血管病患者中,有 13 例(21.7%)MES 阳性,其中分别有6 例和7 例随机分入双联抗血小板组和双联抗血小板与阿托伐他汀联用组。两组性别、高血压、糖尿病、冠心病、吸烟、饮酒、既往卒中史等构成比以及年龄、发病至微栓子监测时间、发病至药物干预时间等均无显著差异。双联抗血小板组与双联抗血小板与阿托伐他汀联用组治疗前微栓子数量分别为(8.83 ± 1.17)和(9.00 ± 1.83)个/h,无显著差异(P = 0.851);治疗第 2 天和第 7 天,双联抗血小板组微栓子数量分别为(4.17 ± 1.47)和(2.17 ± 0.75)个/h,分别显著多于双联抗血小板与阿托伐他汀联用组的(1.43 ± 0.976)(P = 0.002)和(0.71 ± 0.488)个/h(P = 0.003)。随访8 d,两组均无缺血事件发生。**结论**　双联抗血小板药或与他汀类药物联合应用均可减少 MES,但后者 MES 数量减少更为显著。但由于例数较少,这一结论尚需大规模多中心随机对照试验进一步验证。MES 监测在评价抗血小板药或抗血小板药与他汀类药物联用中有一定的价值。

【关键词】 栓塞;卒中;脑缺血;脑缺血发作,短暂性;超声检查,多普勒,经颅;羟甲基戊二酰基 CoA 还原酶抑制剂;阿托伐他汀;血小板聚集抑制药;阿司匹林;氯吡格雷;治疗结果

Role of microembolic signals in the evaluation of antithrombotic agent therapy: a preliminary study

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【**Abstract**】 **Objective** To preliminarily study on the values of microembolic signal (MES) monitoring in the evaluation of anti-platelet agent or anti-platelet agent + statins in patients with acute ischemic cerebrovascular disease. **Methods** Among the patients with acute ischemic cerebrovascular disease in the carotid system who performed MES monitoring, the MES-positive patients were ramdomly allocated into dual antiplatelet group (aspirin 100 mg/d + clopidogrel 75 mg/d) and dual antiplatelet + atorvastatin group (aspirin 100 mg/d + clopidogrel 75 mg/d + atorvastatin 20 mg/d). MESs were monitored by transcranial Doppler ultrasound. **Results** Among the 60 patients with acute cerebrovascular disease in the carotid system, 13 (21.7%) were MES positive, in which, 6 and 7 were randomly divided into dual antiplatelet group and dual antiplatelet + atorvastatin group respectively. There were no significant differences in the constituent ratios of sex, hypertension, diabetes, coronary heart disease, smoking, alcohol

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consumption, and history of previous stroke as well as the age, time from onset to microembolic monitoring, and time from onset to drug intervention between the 2 groups. There were no significant differences in the numbers of microemboli (8.83 ± 1.17/h *vs.* 9.00 ± 1.83/h) before treatment between the dual antiplatelet group and dual antiplatelet + atorvastatin group (P = 0.851); 2 and 7 days after treatment, the numbers of microemboli were 4.17 ± 1.47 and 2.17 ± 0.75/h respevtively in the duural antiplatelet group, and they were significantly higher than 1.43 ± 0.976 and 0.71 ± 0.488/h) respevtively in the dual antiplatelet + atorvastatin group (P = 0.002 and P = 0.003). They were followed up for 8 days; and there were no ischemic events in both groups. **Conclusions** The dual antiplatelet agents or those in combination with statins might reduce the number of MES, but when they were used in combination with statins, the number of MES reduced more significant. However, because there are only a few patients in the study, this conclusion still needs to be further validated in a large-scale multicenter randomized controlled trial. The MES monitoring has a certain value in the evaluation of anti-platelet drugs or those in combination with statins

【**Key words**】 Embolism; Stroke; Brain ischemia; Ischemic attack, transient; Hydroxymethylglutaryl-CoA reductase inhibitors; Atorvastatin; Ultrasonography, Doppler, transcranial; Clopidogrel; Platelet aggregation inhibitors; Aspirin; Treatment outcome

在我国，急性缺血性脑血管病的治疗和二级预防以药物为主，这些药物主要通过抗血小板聚集、稳定动脉粥样硬化斑块和延缓动脉粥样硬化进程来防治急性缺血性事件。微栓子信号（microembolic signals, MES）是公认的提示粥样斑块是否稳定的重要客观指标，对临床治疗具有指导性意义[1]。多项研究[2-6]提示，急性缺血性卒中早期监测到的 MES 数量动态变化与血管事件复发相关。因此，临床上可通过急性期监测 MES 数量的动态变化评价药物治疗对斑块的稳定效应和近期卒中复发的可能性。随着对他汀类药物认识的深入，其稳定动脉粥样硬化斑块的作用已得到认同[7]。氯吡格雷与阿司匹林联合应用减少有症状颈动脉狭窄患者栓子（Clopidogrel and Aspirin for Reduction of Emboli in Symptomatic Carotid Stenosis, CARESS）[8]和氯吡格雷与阿司匹林联合应用减少急性卒中或伴有大动脉狭窄和微栓子信号的短暂性脑缺血发作患者脑梗死（clopidogrel plus aspirin for infarction reduction in acute stroke or transient ischaemic attack patients with large artery stenosis and microembolic signals, CLAIR）[9]试验评价了抗血小板药对急性缺血性脑血管病患者 MES 数量的影响，但他汀类药物与抗血小板药联合应用对急性缺血性脑血管病患者 MES 数量影响的研究较少。为此，本研究对他汀类药物联合双联抗血小板药对 MES 数量的影响进行了探讨。

1 对象和方法

1.1 研究对象及分组

研究对象为 2008 年 12 月至 2010 年 8 月在青岛大学医学院附属医院神经内科住院的急性缺血性脑血管病并伴有有症状颈动脉狭窄患者。纳入标准为：（1）于发病7 d内就诊的急性缺血性脑血管病患者，症状均来源于颈动脉系统。脑梗死临床诊断依据1995 年第四届全国脑血管病学术会议标准，并经 MRI 证实。短暂性脑缺血发作诊断依据 2002 年最新标准：因局部脑或视网膜缺血引起的短暂性神经功能缺损发作，典型的临床症状持续不超过1 h，影像学无急性脑梗死证据。（2）颈部 CT 血管造影、数字减影血管造影或颈部血管超声检查证实，症状侧颈动脉狭窄30% ~90%。（3）颞窗透声良好，能显示清晰的血流频谱；（4）血清胆固醇正常。排除标准：（1）美国国立卫生研究院卒中量表（National Institutes of Health Stroke Scale, NIHSS）评分 >8 分；（2）血管检查证实有症状颈动脉或颅内动脉闭塞；（3）合并其他重大疾病，如恶性肿瘤晚期、肾功能衰竭（肌酐 >200 μmol/L）、肝硬化、严重痴呆或精神疾病；（4）合并心房颤动等严重心律失常；（5）心脏超声检查发现附壁血栓、主动脉和主动脉弓斑块形成；（6）风湿性心脏病或心脏瓣膜置换术后。

本研究经青岛大学医学院附属医院伦理学委员会审查认定，患者及其家属均签署知情同意书。随机分为双联抗血小板组和双联抗血小板与阿托伐他汀联用组。

1.2 微栓子监测

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表 1　双联抗血小板组与双联抗血小板与阿托伐他汀联用组基线特征

变量	双联抗血小板组(n=7)	双联抗血小板与阿托伐他汀联用组(n=6)	P值
年龄(岁,$\bar{x}\pm s$)	65.7±5.96	65.0±6.81	0.844[a]
男性(n,%)	4(57.1)	5(83.3)	0.559[b]
高血压(n,%)	6(85.7)	3(50.0)	0.266[b]
糖尿病(n,%)	1(14.3)	2(33.3)	0.559[b]
冠心病(n,%)	0(0)	1(16.7)	0.462[b]
既往卒中史(n,%)	3(42.9)	1(16.7)	0.559[b]
吸烟(n,%)	6(85.7)	4(66.7)	0.559[b]
饮酒(n,%)	6(85.7)	3(50.0)	0.266[b]
发病至微栓子监测时间(h,$\bar{x}\pm s$)	6.5±3.62	8.1±1.91	0.306[a]
发病至药物干预时间(h,$\bar{x}\pm s$)	7.8±2.11	8.7±1.18	0.336[a]

[a] t 检验;[b] Fisher 精确概率法

采用德力凯 EMS-9EBx2P 经颅多普勒(transcranial Doppler, TCD)检测仪,于患者入院后立即行 60 min MES 监测,并分别于入院后第 0、2 和7 天再次行 MES 监测,每次60 min。患者取仰卧位,于安静休息状态下,采用2 Mz探头取得有症状颈动脉狭窄侧大脑中动脉最清晰血流信号,固定 Spencer 监护头架,调整深度和探头方向,深度48～58 mm,两点间距离≥6 mm,取样容积6～12 mm,MES 相对强度阈值>5 dB,并尽可能降低增益值以确保频谱清晰。应用德力凯 2006 专业 TCD 软件 V1.3.3 记录处理结果。MES 监测过程均由同一经过系统培训的有经验的专业人员操作,监测完毕后脱机回放每一 MES 信号,以除外伪差和干扰等情况,并经 2 名神经科医生同时鉴别确认。MES 识别标准[10]:(1)时程短暂,持续时间<300 ms;(2)强度较背景血流信号≥3 dB;(3)单向出现于多普勒速度频谱中;(4)音频信号表现为"劈啪音"或"鸟鸣声";(5)于心动周期内随意出现;(6)在2 个监测深度存在时间延迟。

1.3　药物治疗

双联抗血小板组在常规治疗的基础上给予阿司匹林(拜耳医药保健有限公司)100 mg/d+氯吡格雷(赛诺菲安万特(杭州)制药有限公司)75 mg/d;双联抗血小板与阿托伐他汀联用组在双联抗血小板组的基础上加用阿托伐他汀(大连辉瑞制药有限公司)20 mg/d。

1.4　统计学分析

使用 SPSS 15.0 统计软件包进行数据分析。计数资料,包括双联抗血小板组和双联抗血小板与阿托伐他汀联用组性别、高血压、糖尿病、冠心病、吸烟、饮酒、既往卒中史等构成比用率表示,组间比较采用 Fisher 精确概率法计算 P 值;计量资料,包括双联抗血小板组和双联抗血小板与阿托伐他汀联用组年龄、发病至微栓子监测时间、发病至药物干预时间和 MES 数量用 $\bar{x}\pm s$ 表示,组间比较用 t 检验;$P<0.05$ 认为有显著差异。

2　结果

共对 60 例急性缺血性脑血管病患者进行了微栓子监测,13 例(21.7%)微栓子监测阳性患者全部纳入本研究,其中7 例随机分入双联抗血小板组,6 例分入双联抗血小板与阿托伐他汀联用组。

双联抗血小板组与双联抗血小板与阿托伐他汀联用组基线特征比较,性别、高血压、糖尿病、冠心病、吸烟、饮酒、既往卒中史等构成比以及年龄、发病至微栓子监测时间、发病至药物干预时间等均无显著差异(表 1)。

双联抗血小板组与双联抗血小板与阿托伐他汀联用组治疗前微栓子数量分别为(8.83±1.17)和(9.00±1.83)个/h,无显著差异(P=0.851);治疗第 2 天和第 7 天,双联抗血小板组微栓子数量分别为(4.17±1.47)和(2.17±0.75)个/h,分别显著多于双联抗血小板与阿托伐他汀联用组的(1.43±0.976)(P=0.002)和(0.71±0.488)个/h(P=0.003)。随访8 d,两组均无缺血事件发生。

3　讨论

本研究显示,缺血性脑血管病发作急性期即可检出 MES,支持国外有关报道[11-13]。以往报道,在急性缺血性脑血管病患者中,MES 检出阳性率可达 9.3%～51%[14]。在本研究中,60 例急性缺血性脑血管病患者中有13 例检出 MES,MES 阳性率为 21.7%,与国外诸多研究[13,15-18]一致。尽管有研究表明 MES 数量会随病程延长而动态减少[7,19],但也有研究显示药物干预是 MES 数量迅速减少的重要原因[9-10,20]。

MES 的出现以及数量与急性缺血性脑血管病患者近期卒中复发密切相关[7,21]。Goertler 等[22]发现,急性缺血性脑血管病患者早期予抗血栓药治疗,在 4 d 内有效控制 MES 数量的病例,其在6 周内缺血性卒中复发风险将大大降低,相反,MES 持续存在的病例近期卒中复发风险是无 MES 卒中患者的

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40 倍。但是,目前尚无针对控制 MES 数量的标准化药物治疗方案。CARESS 首次应用 MES 作为标志物评价抗血小板药的疗效。该试验纳入病例均为颅外动脉狭窄 > 50%、发病3 个月内的缺血性卒中患者,将其中 MES 阳性患者随机分为2 组,分别予氯吡格雷与阿司匹林双联抗血小板治疗或单用阿司匹林治疗。结果显示,与单用阿司匹林相比,氯吡格雷与阿司匹林双联抗血小板治疗能显著降低颅外动脉粥样硬化卒中患者 MES 阳性率,并能使第 7 天时的相对危险度降至 37%。但是,该试验未纳入颅内动脉粥样硬化患者。CLAIR 试验[10]纳入了100 例发病7 d内的急性缺血性卒中患者,其中颅内动脉狭窄占绝大多数,MES 阳性患者随机接受连续7 d的氯吡格雷 + 阿司匹林治疗或安慰剂 + 阿司匹林治疗。该试验提示,在以颅内大动脉狭窄为主的急性缺血性卒中患者中,氯吡格雷与阿司匹林联合应用能较单用阿司匹林显著减少 MES,并显著减少卒中复发。以上 2 项大型试验均提示,双联抗血小板治疗能显著降低 MES 数量和7 d内卒中复发风险。

近年来,他汀类药物在稳定动脉粥样硬化斑块方面受到广泛关注。他汀类药物为羟甲基戊二酰基 CoA 还原酶抑制剂,是一类在临床上广泛使用的降胆固醇调脂药。该类药物除通过调脂作用使动脉粥样硬化斑块进展延缓或回缩外,还能通过其他多种机制调节动脉粥样硬化斑块组成成分,提高斑块稳定性,使其不易破裂和形成血栓[23-26]。20 世纪90 年代初期,3 项里程碑式的大型临床试验,即斯堪的纳维亚辛伐他汀生存研究(Scandinavian Simvastatin Survival Study, 4S)[27]、胆固醇与复发事件(Cholesterol and Recurrent Events, CARE)试验[28]以及缺血性疾病普伐他汀长期干预(Long-Term Intervention with Pravastatin in Ischaemic Disease, LIPID)研究[29],初步确定了他汀类药物在预防冠状动脉粥样硬化性心脏病方面的重要作用,其中LIPID试验结果表明他汀类药物使卒中发生风险降低 19%。心脏保护研究(Heart Protection Study, HPS)[30]纳入3 280 例脑血管病患者和另外17 256 例其他动脉闭塞性疾病或糖尿病患者,随机分入辛伐他汀40 mg/d和相匹配的安慰剂组。结果显示,他汀类药物治疗不但能迅速减少冠状动脉事件的发生,而且还使缺血性卒中发生减少约1/4(即使患者胆固醇水平并不高),在急性缺血性脑血管病早期即可发挥调脂外作用。HPS 研究还提供了肯定的论据,说明他汀类药物治疗对患有脑血管病,甚至无冠心病表现的患者均有益。理论上,他汀类药物可能与不稳定斑块的提示物 MES 有一定的关联,但尚无相关报道。在本研究中,13 例 MES 阳性患者在给予双联抗血小板或与他汀类药物联合应用后,MES 数量较治疗前显著减少,其中双联抗血小板与他汀类药物联合应用组 MES 数量较双联抗血小板治疗组显著减少,至少表明在发病早期双联抗血小板与他汀类药物联合应用能显著减少 MES 数量,提示双联抗血小板与他汀类药物联合应用对斑块的稳定作用可能优于双联抗血小板药治疗。在本研究中,两组随访期间均未出现缺血事件复发,可与随访期较短、观察病例数量较少有关。因此,本研究的结论尚需大规模多中心随机对照试验进一步验证。但是,MES 监测在评价抗血小板药或抗血小板药与他汀类药物联用中的价值值得重视。

参考文献

[1] Poppert H, Sadikovic S, Sander K, et al. Embolic signals in unselected stroke patients: prevalence and diagnostic benefit. Stroke, 2006, 37: 2039-2043.

[2] Siebler M, Nachtmann A, Sitzer M, et al. Cerebral microembolism and the risk of ischemia in asymptomatic high-grade internal carotid artery stenosis. Stroke, 1995, 26: 2184-2186.

[3] Babikian VL, Wijman CA, Hyde C, et al. Cerebral microembolism and early recurrent cerebral or retinal ischemic events. Stroke, 1997, 28: 1314-1318.

[4] Molloy J, Markus HS. Asymptomatic embolization predicts stroke and TIA risk in patients with carotid artery stenosis. Stroke, 1999, 30: 1440-1443.

[5] Censori B, Partziguian T, Casto L, et al. Doppler microembolic signals predict ischemic recurrences in symptomatic carotid stenosis. Acta Neurol Scand, 2000, 101: 327-331.

[6] Goertler M, Blaser T, Krueger S, et al. Cessation of embolic signals after antithrombotic prevention is related to reduced risk of recurrent arterioembolic transient ischaemic attack and stroke. J Neurol Neurosurg Psychiatry, 2002, 72: 338-342.

[7] Valton L, Larrue V, le Traon AP, et al. Microembolic signals and risk of early recurrence in patients with stroke or transient ischemic attack. Stroke, 1998, 29: 2125-2128.

[8] Okazaki S, Yokoyama T, Miyauchi K, et al. Early statin treatment in patients with acute coronary syndrome: demonstration of the beneficial effect on atherosclerotic lesions by serial volumetric intravascular ultrasound analysis during half a year after coronary event: the ESTABLISH Study. Circulation, 2004, 110: 1061-1068.

[9] Markus HS, Droste DW, Kaps M, et al. Dual antiplatelet therapy with clopidogrel and aspirin in symptomatic carotid stenosis evaluated using doppler embolic signal detection: the Clopidogrel and Aspirin for Reduction of Emboli in Symptomatic Carotid Stenosis (CARESS) trial. Circulation, 2005, 111: 2233-2240.

[10] Wong KS, Chen C, Fu J, et al; CLAIR study investigators. Clopidogrel plus aspirin versus aspirin alone for reducing embolisation in patients with acute symptomatic cerebral or carotid artery stenosis (CLAIR study): a randomised, open-label, blinded-endpoint trial. Lancet Neurol, 2010, 9: 489-497.

[11] Markus HS, MacKinnon A. Asymptomatic embolization detected by Doppler ultrasound predicts stroke risk in symptomatic carotid artery stenosis. Stroke, 2005, 36: 971-975.

[12] van Zuilen EV, Moll FL, Vermeulen FE, et al. Detection of cerebral microemboli by means of transcranial Doppler monitoring before and after carotid endarterectomy. Stroke, 1995, 26: 210-213.

万方数据

[13] Droste DW, Dittrich R, Kemény V, et al. Prevalence and frequency of microembolic signals in 105 patients with extracranial carotid artery occlusive disease. J Neurol Neurosurg Psychiatry, 1999, 67: 525-528.
[14] Sliwka V, Lingnau A, Stonlmann W D, et al. Prevalence and time course of microembolic signals in patients with acute stroke. Stroke, 1997, 28: 358.
[15] Siebler M, Kleinschmidt A, Sitzer M, et al. Cerebral microembolism in symptomatic and asymptomatic high-grade internal carotid artery stenosis. Neurology, 1994, 44: 615-618.
[16] Markus HS, Thomson ND, Brown MM. Asymptomatic cerebral embolic signals in symptomatic and asymptomatic carotid artery disease. Brain, 1995, 118: 1005-1011.
[17] Molloy J, Markus HS. Asymptomatic embolization predicts stroke and TIA risk in patients with carotid artery stenosis. Stroke, 1999, 30: 1440-1443.
[18] Georgiadis D, Lindner A, Manz M, et al. Intracranial microembolic signals in 500 patients with potential cardiac or carotid embolic source and in normal controls. Stroke, 1997, 28: 1203-1207.
[19] North American Symptomatic Carotid Endarterectomy Trial Collaborators. Beneficial effect of carotid endarterectomy in symptomatic patients with high-grade carotid stenosis. N Engl J Med, 1991, 325: 445-453.
[20] Esagunde RU, Wong KS, Lee MP, et al. Efficacy of dual antiplatelet therapy in cerebrovascular disease as demonstrated by a decline in microembolic signals. A report of eight cases. Cerebrovasc Dis, 2006, 21: 242-246.
[21] Consensus Committee of the Ninth International Cerebral Hemodynamic Symposium. Basic identification criteria of Doppler microembolic signals. Stroke, 1995, 26: 1123.
[22] Goertler M, Blaser T, Krueger S, et al. Cessation of embolic signals after antithrombotic prevention is related to reduced risk of recurrent arterioembolic transient ischaemic attack and stroke. J Neurol Neurosurg Psychiatry, 2002, 72: 338-342.
[23] Nissen SE, Nicholls SJ, Sipahi I, et al; ASTEROID Investigators. Effect of very high-intensity statin therapy on regression of coronary atherosclerosis: the ASTEROID trial. JAMA, 2006, 295: 1556-1565.
[24] Okazaki S, Yokoyama T, Miyauchi K, et al. Early statin treatment in patients with acute coronary syndrome: demonstration of the beneficial effect on atherosclerotic lesions by serial volumetric intravascular ultrasound analysis during half a year after coronary event: the ESTABLISH Study. Circulation, 2004, 110: 1061-1068.
[25] Gómez-Hernández A, Sánchez-Galán E, Martín-Ventura JL, et al. Atorvastatin reduces the expression of prostaglandin E2 receptors in human carotid atherosclerotic plaques and monocytic cells: potential implications for plaque stabilization. J Cardiovasc Pharmacol, 2006, 47: 60-69.
[26] Koutouzis M, Nomikos A, Nikolidakis S, et al. Statin treated patients have reduced intraplaque angiogenesis in carotid endarterectomy specimens. Atherosclerosis, 2007, 192: 457-463.
[27] Randomised trial of cholesterol lowering in 4444 patients with coronary heart disease: the Scandinavian Simvastatin Survival Study (4S). Lancet, 1994, 344: 1383-1389.
[28] Goldberg RB, Mellies MJ, Sacks FM, et al; the CARE Investigators. Cardiovascular events and their reduction with pravastatin in diabetic and glucose-intolerant myocardial infarction survivors with average cholesterol levels: subgroup analyses in the Cholesterol and Recurrent Events (CARE) trial. Circulation, 1998, 98: 2513-2519.
[29] The Long-Term Intervention with Pravastatin in Ischaemic Disease (*LIPID*) Study Group. Prevention of cardiovascular events and death with pravastatin in patients with coronary heart disease and a broad range of initial cholesterol levels. N Engl J Med, 1998, 339: 1349-1357.
[30] Collins R, Armitage J, Parish S, et al; Heart Protection Study Collaborative Group. Effects of cholesterol-lowering with simvastatin on stroke and other major vascular events in 20536 people with cerebrovascular disease or other high-risk conditions. Lancet, 2004, 363: 757-767.

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· 医学简讯 ·

颈动脉支架置入术的卒中或死亡风险高于颈动脉内膜切除术

对于颈动脉闭塞患者，与颈动脉内膜切除术（carotid endarterectomy, CEA）相比，颈动脉支架置入术（carotid artery stenting, CAS）似乎与近期和远期不良转归风险增高均相关。

CAS 是 CEA 治疗颈动脉闭塞性病变的一种替代方法。作为一种合理的策略，该疗法得到了美国心脏协会/美国卒中协会的支持，并被欧洲血管外科学会推荐用于某些情况下的颈动脉闭塞病变。然而，CAS 相对于 CEA 的安全性和有效性仍然存在争议。

纽约大学医学院的 Bangalore 等对 2010 年 6 月以前对2 种治疗方法进行比较的13 项随机试验进行了汇总分析，总共包括7 477 例颈动脉疾病患者。他们对围手术期死亡、心肌梗死和卒中风险以及中期和远期转归进行了评价。

在最初 30 d 内，CAS 组死亡或卒中风险较 CEA 组增高 65%，任何卒中风险增高 67%。然而，在此期间，CAS 组心肌梗死风险较 CEA 组降低 55%，脑神经损伤减少 85%。在 30 d 内或此后，使用包括死亡、任何卒中或同侧卒中在内的联合终点评价中期和长期转归。与 CEA 相比，CAS 的上述联合终点风险增高 19%，由卒中、同侧卒中和死亡的各种组合风险也显著增高。CAS 也与再狭窄风险增高 180% 相关。

在这项采用当代研究标准转归指标进行的迄今最大和最全面的汇总分析中，CAS 与围手术期以及中、远期转归风险增高都相关，但能减少围手术期心肌梗死和脑神经损伤。Bangalore 等认为，迫切需要一些策略来确定最适合 CAS 或 CEA 治疗的患者。

（李宏建）

万方数据

微栓子信号在评价抗血小板药治疗中的作用初步探讨

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参考文献(30条)

1. Poppert H;Sadikovic S;Sander K Embolic signals in unselected stroke patients:prevalence and diagnstic benefit 2006

2. Siebler M;Nachtmann A;Sitzer M Cerebral micrcembolism and the risk of ischemia in asymptomatic high-grade intemal carotid artery stenosis 1995

3. Babikian VL;Wijman CA;Hyde C Cerebral microembolism and early recurrent cerebral or retinal ischemic events 1997

4. Molloy J;Markus HS Asymptomatic embolization predicts stroke and TIA risk in patients with carotid artery stenosis[外文期刊] 1999

5. Censori B;Partziguian T;Casto L Doppler microembolic signals predict ischemic recurrences in symptomatic carotid stenosis 2000

6. Goertler M;Blaser T;Krueger S Cessation of embolic signals after antithrombotic prevention is related to reduced risk of recurrent arterioembolic transient ischaemic attack and stroke 2002

7. Valton L;Larrue V;le Traon AP Microembolic signals and risk of early recurrence in patients with stroke or transient ischemic attack[外文期刊] 1998(10)

8. Okazaki S;Yokoyama T;Miyauchi K Early statin treatment in patients with acute coronary syndrome:demonstration of the beneficial effect on atherosclerotic lesions by serial volumetric intravascular ultrasound analysis during half a year after coronary event:the ESTABLISH Study[外文期刊] 2004(9)

9. Markus HS;Droste DW;Kaps M Dual antiplatelet therapy with clopidogrel and aspirin in symptomatic carotid stenosis evaluated using doppler embolic signal detection:the Clopidogrel and Aspirin for Reduction of Emboli in Symptomatic Carotid Stenosis (CARESS) trial[外文期刊] 2005

10. Wong KS;Chen C;Fu J CLAIR study investigators.Clopidogrel plus aspirin versus aspirin alone for reducing embolisation in patients with acute symptomatic cerebral or carotid artery stenoosis (CLAIR study):a randomised,open-label,blinded-endpoint trial[外文期刊] 2010

11. Markus HS;MacKinnon A Asyrnptomatic embolization detected by Doppler ultrasound predicts stroke risk in symptomatic carotid artery stenosis 2005

12. van Zuilen EV;Moll FL;Vermeulen FE Detection of cerebral microemboli by means of transcranial Doppler monitoring before and after carotid endarterectomy 1995

13. Droste DW;Dittrieh R;Kemény V Prevalence and frequency of microembolic signals in 105 patients with extracranial carotid artery occlusive disease[外文期刊] 1999

14. Sliwka V;Lingnau A;Stonlmann W D Prevalence and time course of microembolic signals in patients with acute stroke[外文期刊] 1997

15. Siebler M;Kleinschmidt A;Sitzer M Cerebral microembolism in symptomatic and asyraptomatic high-gade internal carotid artery stenosis 1994

16. Markus HS;Thomson ND;Brown MM Asymptomatic cerebral embolic signals in symptomatic and asymptomatic carotid artery disease[外文期刊] 1995

17. Molloy J;Markus HS Asymptomatic embolization predicts stroke and TIA risk in patients with carotid artery stenosis[外文期刊] 1999

18. Georgiadis D;Lindner A;Manz M Intracranial microembolicsignals in 500 patients with potential cardiac or cerotid embolic source and in normal controls 1997

19. North American Symptomtic Carotid Endarterectomy Trial Collaborators Beneficial effect of carotid endarterectomy in syraptornatic patients with high-grade carotid stenosis 1991

20. Esagtmde RU;Wong KS;Lee MP Efficacy of dual antiplatelet therapy in cerebrovascular disease as demonstrated by a decline in microembolic signals A report of eight cases 2006

21. Consensus Committee of the Ninth International Cerebral Hemodynamic Symposium Basic identification critera of Doppler microembolic signals[外文期刊] 1995

22. Goertler M;Blaser T;Krueger S Cessation of embolic signals after antithrombotic prevention is related to reduced risk of recurrent arterioembolic transient ischaemic attack and stroke 2002

23. Nissen SE;Nicholls SJ;Sipahi I ASTEROID Investigators.Effect of very high-intensity statin therapy on regression of atherosclerosis:the ASTEROID trial 2006

24. Okazaki S;Yokoyama T;Miyauchi K Early statin treatment in patients with acute coronary syndrome:demonstration of the beneficial effect on atherosclerotic lesions by serial volumetric intravascular ultrasound analysis during half a year after coronary event:the ESTABLISH Study[外文期刊] 2004(9)

25. Gómez-Hernández A;Sánchez-Galán E;Martín-Ventura JL Atorvastatin reduces the expression of prostaglandin E2 receptors in human carotid atherosclerotic plaques and monocytic ceils:potential implications for plaque stabilization 2006

26. Koutouzis M;Nomikos A;Nikolidakis S Statin treated patients have reduced intraplaque angiogenesis in carotid endarterectomy specimens 2007

27. Randomised trial of cholesterol lowering in 4444 patients with coronary heart disease:the Scandinavian Simvastatin Survival Study (4S) 1994

28. Goldberg RB;Mellies MJ;Sacks FM the CARE Investigetors.Cardiovascular events and their reduction with pravastatin in diabetic and glucose-intolerant myocardial infarction survivors with average cholesterol levels:subgroup analyses in the Cholesterol and Pecurrent Events (CARE) trial 1998

29. The Long-Term Intervention with Pravastatin in Ischaemic Disease (LIPID) Study Group Prevention of cardiovascular events and death with pravastatin in patients with coronary heart disease and a broad range of initial cholesterol levels 1998

30. Collins R;Armitage J;Parish S Heart Protection Study Collaborative Group.Effects of cholesterol-

lowering with simvastatin on stroke and other major vascular events in 20536 people with cerebrovascular disease or other high-risk conditions 2004

本文读者也读过(10条)

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2. 伊帅.潘旭东.马爱军.隋艳玲.王琨.YI Shuai.PAN Xu-dong.MA Ai-jun.SUI Yan-ling.WANG Kun 有症状颈动脉狭窄的微栓子信号监测[期刊论文]-国际脑血管病杂志2010,18(6)

3. 隋艳玲.潘旭东.SUI Yan-ling.PAN Xu-dong 脑缺血患者的微栓子信号与黏附分子[期刊论文]-国际脑血管病杂志2010,18(7)

4. 李蕾.张秀清.LI Fan.ZHANG Xiu-qing 大脑中动脉供血区梗死的远隔损害[期刊论文]-国际脑血管病杂志 2011,19(3)

5. 伊帅.潘旭东.YI Shuai.PAN Xu-dong 微栓子监测新进展[期刊论文]-国际脑血管病杂志2009,17(8)

6. 刘鑫爱.LIU Xin-ai 微栓子监测在缺血性脑血管病中的临床应用与研究现状[期刊论文]-医学综述2011,17(17)

7. 袁妙兰.宋志彬.梁干雄 微栓子监测与动脉硬化斑块关系的研究进展[期刊论文]-广东医学2010,31(2)

8. 陈盈.邢英琦.冯加纯.CHEN Ying.XING Ying-Qi.FENG Jia-Chun 微栓子与缺血性卒中的研究进展[期刊论文]-中国卒中杂志2011,06(4)

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10. 叶斌.刘睿.YE Bin.LIU Rui 经颅彩色多普勒微栓子监测与缺血性脑血管病进展相关性分析[期刊论文]-解剖与临床2011,16(3)

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