

•临床研究 Clinical research•

颈动脉支架植入术后低血压危险因素分析

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【摘要】 目的 探讨颈动脉狭窄患者颈动脉支架植入术(CAS)后产生低血压的危险因素。**方法** 回顾性分析 2018 年 1 月至 12 月在北京医科大学宣武医院接受 CAS 治疗的 137 例颈动脉狭窄患者临床资料。患者平均年龄 66.3 岁,手术侧颈动脉重度狭窄 98 例,中度狭窄 39 例。采用单因素和多因素 logistic 回归法分析评价持续性低血压的危险因素。**结果** 137 例颈动脉狭窄患者 CAS 术后有 51 例(37.2%)发生低血压。单因素分析提示,与 CAS 术后低血压相关的因素,包括颈动脉狭窄部位在球部、术前存在未控制的高血压、钙通道阻滞剂(CCB)类药物史、尿素氮、术后 24 h 静脉液体摄入量。多因素 logistic 回归分析结果显示,有溃疡斑块、术前存在未控制高血压、术后 24 h 静脉液体摄入量,是 CAS 术后低血压的独立危险因素。**结论** 有溃疡斑块、术前高血压未控制、术后 24 h 液体摄入量较多患者,更易发生 CAS 术后低血压。

【关键词】 颈动脉支架植入术; 低血压; 危险因素

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【Abstract】 Objective To investigate the risk factors related to the hypotension occurring after carotid artery stenting(CAS) in patients with carotid artery stenosis. **Methods** The clinical data of 137 patients with carotid artery stenosis, who were treated with CAS at the Xuanwu Hospital of Capital Medical University of China during the period from January 2018 to December 2018, were retrospectively analyzed. The mean age of the patients was 66.3 years. Severe carotid stenosis and moderate carotid stenosis on the surgical side were detected in 98 patients and 39 patients respectively. Both univariate and multivariate logistic regression analyses were used to evaluate the risk factors for persistent hypotension. **Results** Among the 137 patients, 51 (37.2%) developed hypotension after CAS. Univariate analysis indicated that the factors related to the occurrence of postoperative hypotension included stenosis located the carotid bulb, preoperative presence of uncontrolled hypertension, history of taking calcium channel blocker(CCB), urea nitrogen level, and the amount of intravenous fluid intake within the first 24 hours after CAS. Multivariate logistic regression analysis revealed that the presence of ulceration plaque, preoperative presence of uncontrolled hypertension, and the amount of intravenous fluid intake within the first 24 hours after CAS were the independent risk factors related to the occurrence of postoperative hypotension after CAS. **Conclusion** In the patients, who have ulceration plaque and uncontrolled hypertension before CAS, and who receive large amount of intravenous fluid intake within the first 24 hours after CAS, the post-CAS hypotension is more likely to occur. (J Intervent Radiol, 2022, 31: 394-396)

【Key words】 carotid artery stenting; hypotension; risk factor

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颈动脉支架植入术(carotid artery stenting,CAS)作为一种颈动脉狭窄治疗方法,可有效减少脑卒中发生,尤其适合颈动脉内膜剥脱术(carotid endarterectomy,CEA)高危患者^[1-2]。低血压是CAS术后常见血流动力学异常现象,发生率约40%^[3-5]。发生机制是CAS术中球囊和/或支架植入过程中颈动脉窦压力感受器刺激所导致^[6]。CAS术后血压调控对避免脑缺血至关重要^[7]。研究证明,CAS术后低血压与脑卒中和心肌梗死增加相关,且明显延长住院时间,甚至发生急性肾衰竭等严重不良事件,增加30 d病死率^[8-12]。早期识别CAS术后有低血压风险患者有助于提早预防、及时治疗,从而避免不良预后发生。本文回顾性分析接受CAS治疗的颈动脉狭窄患者临床资料,探讨引起低血压相关危险因素,为临床提早识别CAS术后低血压高危人群提供理论依据。

1 材料与方法

1.1 研究对象

收集2018年1月至12月在首都医科大学宣武医院接受CAS治疗的137例颈动脉狭窄患者临床资料。其中男101例,女36例,平均年龄66.3岁;手术侧颈动脉重度狭窄98例,中度狭窄39例;狭窄位于球部91例,位于颈内动脉或颈总动脉46例;血管超声提示17例存在溃疡斑块,对侧颈动脉存在狭窄或闭塞48例。有高血压病史99例,其中有患者术前存在未控制的高血压,降压药物应用后血压仍 $\geq 140/90$ mmHg(1 mmHg=0.133 kPa)。

1.2 统计学方法

采用SPSS 20.0软件进行统计学分析。计量资料用 t 检验或秩和检验,计数资料用卡方检验,有关变量作单因素分析,根据单因素分析结果选择可能有意义的变量作logistic多因素回归分析。

2 结果

137例颈动脉狭窄患者CAS术后有51例(37.2%)发生低血压,期间首先采用快速补液升压治疗,如补液效果差则采用多巴胺维持血压平稳。137例患者出院前未发生低血压相关严重并发症。单因素分析提示,CAS术后低血压相关因素包括狭窄部位在球部、术前存在未控制的高血压、钙通道阻滞剂(CCB)类药物史、尿素氮、术后24 h静脉液体入量(表1)。根据单因素分析结果,多因素logistic回归分析显示,有溃疡斑块、术前存在未控制高血

压、术后24 h静脉液体入量,是引起CAS术后发生低血压的独立危险因素(表2)。

表1 CAS术后低血压危险因素单因素分析结果

变量参数	发生低血压 (n=51)	未发生低血压 (n=86)	P值
狭窄程度/n			0.552
重度	38	60	
非重度	13	26	
对侧狭窄/n			0.152
有	14	34	
无	37	52	
狭窄部位/n			0.022
球部	40	51	
非球部	11	35	
溃疡斑块/n			0.195
有	4	13	
无	47	73	
术前存在未控制高血压/n			0.032
有	15	42	
无	36	44	
CCB类药物史/n			0.030
有	12	36	
无	39	50	
尿素氮/mmol/L	5.3(4.0,6.5)	5.8(4.8,7.2)	0.029
术后24 h静脉液体入量/mL	3 059±1 331	2 686±875	0.005

表2 CAS术后低血压多因素logistic分析结果

危险因素	系数值	OR	95%CI	P值
溃疡斑块	1.613	5.018	1.087~23.156	0.039
术前存在未控制高血压	1.182	3.261	1.269~8.378	0.014
术后24 h静脉液体入量	0.001	1.001	1.000~1.001	0.012

3 讨论

研究表明,严重颈动脉狭窄患病率约为4%,而颈动脉狭窄是目前公认的引起脑缺血的主要原因之一^[13-14]。目前颈动脉狭窄重建手术包括CEA、颈动脉血管成形术和CAS。自SAPPHIRE随机对照试验研究结果发布以来,CAS在有症状的颈动脉狭窄外科高危患者中常规进行;发现带有栓子保护装置的CAS术后1年主要不良事件发生率低于CEA(12.0%比20.1%),且创伤小、恢复快,尤其适合CEA高危患者^[15-16]。但CAS术中操作过程,如导丝刺激、球囊扩张、支架植入等会对颈动脉窦产生机械性扩张和牵拉,导致术后易出现低血压^[6]。本研究显示狭窄病变部位位于颈动脉球部与非球部相比,术后低血压发生率更高,这也恰好证实了这一点;但多因素分析结果未提示球部狭窄为CAS术后低血压的独立危险因素,可能与入组患者非球部狭窄病变数较少相关。

本研究多因素分析结果提示溃疡斑块为CAS

术后低血压的独立危险因素,与既往文献报道一致^[17]。溃疡斑块质地较硬、形状不规则、呈火山口样,CAS 术中支架植入后不易成形,大多需要后扩张,这一操作增加了对颈动脉窦的刺激,从而增加术中和术后低血压发生率^[18]。

有研究指出,高血压病史是 CAS 术后患者低血压的保护因素^[16]。但该研究并未分析高血压控制及降压药物应用情况。本研究根据高血压控制情况分为血压控制良好组(含既往无高血压病史患者)和术前存在未控制高血压组(降压药物应用后血压仍 $\geq 140/90$ mmHg),以区分患者术前真实血压情况,结果显示术前存在未控制高血压为 CAS 术后低血压的独立危险因素。分析这可能是未控制的高血压会增加患者降压药应用剂量和/或频率,或增加降压药物应用种类,使其反射性低血压风险明显增加的缘故。某些抗高血压药物可能会在麻醉诱导后增加术中低血压风险^[19]。既往有研究表明应用 CCB 患者(40.7%)术后低血压发病率较其他降压药物偏高(血管紧张素转化酶抑制剂 34.1%,噻嗪类利尿剂 33.3%, β 受体阻滞剂 29.1%)^[20]。本研究单因素分析结果表明,CCB 类药物史与 CAS 术后低血压有相关关系。因此,不同类型降压药物用药史对 CAS 术后低血压的影响,还需进一步研究证实。

本研究统计了 CAS 患者术后连续 3 个 24 h 静脉液体入量,结果提示术后第 1 个 24 h 静脉液体入量与术后低血压明显相关。由于患者出现低血压后首选升压手段为补液,对于补液效果欠佳患者再加用血管活性药物,这一结果恰恰证明 CAS 术后 24 h 为低血压发生的高危时段,应加强这一时段的血压监测,做到及早发现、及早治疗,避免低血压导致的严重并发症发生。

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