·临床研究·

分期冠状动脉介入治疗的间隔时间对老年患者肾功能的影响

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【摘 要】 **目的** 探讨分期冠状动脉介入(PCI)治疗的不同间隔时间对老年患者肾功能的影响。**方法** 对2014年1月至2016年6月在辽宁省人民医院进行分期PCI的417例不稳定型心绞痛(UA)或急性非ST段抬高型心肌梗死(NSTEMI)老年冠状动脉多支血管病变(MVD)患者进行回顾性分析。其中,早期再次介入组(A组)172例,两次介入治疗间隔3~7 d;晚期再次介入组(B组)245例,间隔时间15~30 d。记录两组患者基本临床资料、两次PCI术前与术后3 d血清肌酐值(SCr),计算对比剂导致的急性肾损伤(CI-AKI)风险评分、肾小球滤过率估测值(eGFR),检测有无CI-AKI,比较两组患者肾功能。采用SPSS 15.0进行统计分析。计量资料和计数资料组间比较分别采用t检验和χ^2检验。**结果** 两组患者基线临床资料差异无统计学意义($P>0.05$);两次PCI术前术后SCr、eGFR差异均无统计学意义($P>0.05$);A组发生CI-AKI 5例(2.90%),B组6例(2.45%),两组比较差异无统计学意义($P=0.77$);住院期间无紧急透析、新发急性心肌梗死、急性脑卒中、紧急血运重建及死亡等严重不良事件。**结论** 对于CI-AKI风险评分低中危、进行分期PCI的老年MVD患者,不同的间隔时间对其肾功能的影响无明显差异,早期再次PCI是安全可行的。

【关键词】 经皮冠状动脉介入治疗;对比剂导致的急性肾损伤;间隔时间
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Impact of different time interval of staged percutaneous coronary intervention on renal function of elderly patients

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【**Abstract**】 **Objective** To evaluate the impact of different time interval of staged percutaneous coronary intervention(PCI) on renal function of elderly patients. **Methods** Totally 417 elderly of multivessel disease (MVD) patients with unstable angina(UA) or non-ST segment elevation myocardial infarction(NSTEMI), who received staged PCI from January 2014 to June 2016, were analyzed retrospectively. They were divided into the short interval group ($n=172$) and the long interval group ($n=245$) by the time interval of staged PCI. The clinical data were recorded including age, gender, body mass, serum creatinine (SCr) before and after PCI. Body mass index(BMI), the risk score for prediction of contrast-induced acute kidney injury(CI-AKI), and the estimated glomerular filtration rate (eGFR) were obtained. Renal function in patients of the two groups was statistically analyzed. SPSS statistics 15.0 was used to perform the statistical analysis. Measurement data and enumeration data were compared with t test or Chi-square test respectively. **Results** The clinical data including age, gender, BMI, SCr and the risk score for prediction of CI-AKI were not significantly different between the two groups before PCI($P>0.05$). There was no statistical difference of renal function in the two groups before and after PCI($P>0.05$), neither in the incidence of CI-AKI between two groups (2.90% in the short interval group *versus* 2.45% in the long interval group, $P=0.77$). No serious adverse events, such as emergency dialysis, new-onset acute myocardial infarction, acute stroke, emergency revascularization, or death, was reported during hospitalization. **Conclusion** The difference in time intervals of staged PCI has no obvious impact on renal function of elderly MVD patients with UA/NSTEMI. It is safe and feasible for patients with low or moderate risk of CI-AKI to undergo staged PCI after a short time interval.

【**Key words**】 percutaneous coronary intervention; contrast-induced acute kidney injury; time interval
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老年冠心病患者冠状动脉造影常见冠状动脉多支血管病变(multivessel diseases,MVD),临床上为降低手术风险、减少对比剂导致的肾损伤等通常采用分期冠状动脉介入(staged percutaneous coronary intervention,staged PCI)治疗[1]。然而,目前有关碘对比剂应用及PCI的共识与指南[2-6]中对两次PCI间隔的具体时间并无定论,临床工作中不同介入医师的做法也不尽相同。因此,我们回顾性研究了相关病例资料,对此进行了初步探讨。

1 对象与方法

1.1 研究对象

纳入标准:(1)2014年1月至2016年6月在辽宁省人民医院进行分期PCI的MVD患者;(2)两次PCI间隔时间不超过1个月;(3)临床资料完整的不稳型型心绞痛(unstable angina,UA)或急性非ST段抬高型心肌梗死(non-ST segment elevation myocardial infarction,NSTEMI);(4)年龄60~75周岁,男女不限。排除标准:(1)入院时顽固性胸痛伴心力衰竭、威胁生命的室性心律失常,以及血流动力学不稳定而行急诊PCI的NSTEMI;(2)急性ST段抬高型心肌梗死(ST segment elevation myocardial infarction,STEMI);(3)血栓病变、左主干病变、桥血管病变或慢性完全闭塞性病变等;(4)既往曾行冠状动脉CT、经皮冠状动脉造影或PCI;(5)血清肌酐(serum creatinine,SCr)水平≥3 mg/dl(265.2 μmol/L);(6)初次PCI术后72 h内SCr水平升高>0.5 mg/dl(44.2 μmol/L)或较基础值升高>25%。通过本院病历信息系统,查阅病历获取研究对象的临床资料。

1.2 方法

回顾性分析符合入组标准的417例患者。根据两次PCI的间隔时间,将患者分为两组:早期再次介入组(A组),间隔时间3~7 d;晚期再次介入组(B组),间隔时间15~30 d。所有患者均常规行冠状动脉造影与PCI,手术前后常规应用阿司匹林、氯吡格雷、他汀类调脂药以及生理盐水进行水化等治疗。术中选用碘佛醇注射液(江苏恒瑞医药股份有限公司生产,批准文号为国药准字H20067896)。患者PCI手术前后常规抽血化验SCr等。两次PCI的间隔时间由术者根据个人经验决定。

1.3 观察指标

记录患者的临床资料,如:临床诊断、年龄、性别、身高、体质量、生命体征、血常规、血脂、空腹血糖、对比剂种类与用量、两次PCI的间隔时间、两次PCI术前与术后3 d的SCr值、PCI术后有无对比剂导致的急性肾损伤(contrast-induced acute kidney injury,CI-AKI)及住院期间是否发生严重不良事件(如:透析、新发急性心肌梗死、急性脑卒中、紧急血运重建及死亡等)。CI-AKI定义[7]为使用对比剂后72 h内SCr水平升高>0.5 mg/dl或较基线值升高>25%,并排除其他原因所致的肾损伤。计算体质量指数(BMI)、CI-AKI风险评分[5,8]与肾小球滤过率估测值(estimated glomerular filtration rate,eGFR)[5,9];计算公式:eGFR[ml/(min·1.73 m^2)]=175×SCr(mg/dl)$^{-1.234}$×年龄$^{-0.179}$×(0.79女性)。

1.4 统计学处理

采用SPSS 15.0统计软件进行统计学分析。计量资料以均数±标准差($\bar{x}\pm s$)描述,两组间均数比较采用t检验;计数资料以例数(百分率)描述,组间比较采用χ^2检验。所有的统计检验均采用双侧检验,$P<0.05$为差异有统计学意义。

2 结 果

2.1 两组患者基线资料比较

入组患者417例,其中A组172例、B组245例。所有患者均成功完成PCI。统计显示,两组除PCI的间隔时间显著不同以外,患者的基本临床资料无统计学差异(表1)。

2.2 两组患者SCr与eGFR比较

两组患者SCr与eGFR在两次PCI术前术后差异均无统计学意义(表2,表3)。

2.3 两组患者CI-AKI及不良事件比较

两组患者CI-AKI风险评分均为低中危(表1),两次PCI术后A组发生CI-AKI 5例(2.90%),B组6例(2.45%),两组比较,差异无统计学意义($P=0.77$)。住院期间均无紧急透析、新发急性心肌梗死、急性脑卒中、紧急血运重建及死亡等严重不良事件。

3 讨 论

冠状动脉多支血管病变在NSTEMI中高达50%,在UA中也不少见,心脏介入医师对此多采用分期PCI的策略[10,11]。导致医师决定分期PCI的原因[1]是多方面的,包括患者肾脏功能、对比剂的累积使用剂量、病变的复杂程度、是否为急性冠脉综合征、左心室功能、患者年龄、累积辐射剂量、医疗保险等因素。其中,排在首位的就是患者的肾功能。这是因为CI-AKI是医院获得性肾衰的第三大常见原因[5,12],会导致住院时间延长,甚至有增加院内死亡率及发生远期肾功能不全的风险。

表1 两组患者基本资料比较

Table 1 Baseline characteristics of the two groups

Item	Short interval group (n=172)	Long interval group (n=245)	P value
Time interval(d, $\bar{x}\pm s$)	5.18±1.18	24.69±2.79	<0.001
Age(years, $\bar{x}\pm s$)	67.56±3.56	67.96±3.52	0.25
Male[n(%)]	111(64.53)	154(62.86)	0.73
BMI($\bar{x}\pm s$)	24.47±2.21	24.71±2.43	0.31
Hypertension[n(%)]	103(59.89)	139(56.73)	0.52
Diabetes mellitus[n(%)]	52(30.23)	80(32.65)	0.60
Hyperlipemia[n(%)]	60(34.88)	74(30.20)	0.31
Contrast dose of 1st PCI(ml, $\bar{x}\pm s$)	162.61±31.81	159.02±23.68	0.21
Contrast dose of 2nd PCI(ml, $\bar{x}\pm s$)	141.37±19.55	143.00±19.28	0.40
Statin application[n(%)]	172(100.00)	245(100.00)	1.00
Hydration[n(%)]	172(100.00)	245(100.00)	1.00
CI-AKI risk score[n(%)]			0.84
≤5	167(97.10)	237(96.73)	
6-10	5(2.90)	8(3.27)	
11-15	0(0.00)	0(0.00)	
≥16	0(0.00)	0(0.00)	

BMI: body mass index; PCI: percutaneous coronary intervention; CI-AKI: contrast-induced acute kidney injury

表2 两组患者PCI手术前后SCr

Table 2 Comparison of SCr between the two groups

(μmol/L, $\bar{x}\pm s$)

Time point	Short interval group(n=172)	Long interval group(n=245)	P value
Before the 1st PCI	75.69±21.58	74.65±21.14	0.63
After the 1st PCI	76.43±17.83	75.32±20.85	0.54
Before the 2nd PCI	76.79±19.57	74.22±21.14	0.21
After the 2nd PCI	78.19±22.16	76.27±23.33	0.36

SCr: serum creatinine; PCI: percutaneous coronary intervention

表3 两组患者PCI手术前后eGFR

Table 3 Comparison of eGFR between the two groups

[ml/(min·1.73 m^2), $\bar{x}\pm s$]

Time point	Short interval group(n=172)	Long interval group(n=245)	P value
Before the 1st PCI	100.44±24.96	101.38±24.56	0.70
After the 1st PCI	98.37±27.49	100.65±20.46	0.31
Before the 2nd PCI	98.23±29.57	101.51±21.35	0.19
After the 2nd PCI	96.57±30.12	98.71±20.26	0.37

eGFR: estimated glomerular filtration rate; PCI: percutaneous coronary intervention

然而,目前有关碘对比剂应用及PCI的共识与指南[2-6]中对两次PCI间隔的具体时间并无定论,均指出短时间多次应用对比剂将增加CI-AKI的风险,建议两次对比剂应用间隔时间至少72 h,最好14 d以上。该建议的提出是基于SCr一般在应用对比剂后3 d达峰值、10~14 d后下降至基线水平这一病理生理过程,并无充足的临床研究证据[2]。因此,临床工作中不同介入医师的做法也不尽相同。来自美国的一项调查显示[1],对于MVD的UA/NSTEMI患者,22%的医师会单次同时处理靶病变与非靶病变;21%的医师会在处理靶病变术后2周内处理非靶病变;而37%与18%的医师会分别在2周~30 d内处理非靶病变。我院对MVD患者实施分期PCI的间隔时间主要集中在两个时间段:间隔3~7 d和间隔15~30 d。这是因为前者均为单次住院完成,而后者是两次住院完成。因此,我们将入组患者分为早期再次介入组与晚期再次介入组。

除两次对比剂应用的间隔时间外,与CI-AKI相关的危险因素还有很多。CI-AKI风险评分[5,8]是目前被广泛认可的PCI术后CI-AKI预测评分系统。该系统包括年龄>75岁、贫血、低血压、糖尿病、慢性充血性心力衰竭、应用主动脉内球囊反搏、基础eGFR降低以及对比剂用量等危险因素。根据该评分进行危险分层,可分为四组:低危组(≤5分)、中危组(6~10分)、高危组(11~15分)、极高危组(≥16分);评分越高,发生CI-AKI甚至需要透析的风险越高。本研究中,所有老年患者的CI-AKI风险评分均为低危与中危组,早期再次介入组患者PCI术后肾功能及CI-AKI发生率与晚期再次介入组相比无明显差异。这一结果为老年冠状动脉MVD患者缩短分期PCI的间隔时间提供了有力的临床证据。

本研究的局限性:本研究为单中心回顾性研究,样本量较小,入组患者CI-AKI风险评分均为低中危,年龄60~75周岁;分期PCI的间隔时间仅分为两组,而且两组PCI间隔时间均<1个月。因此,需要拓宽入组标准、扩大样本量、细分不同的PCI间隔

时间或进一步延长间隔时间、进行前瞻性研究,从而进一步指导临床实践。

总之,对于 CI-AKI 风险评分低中危、分期 PCI 的老年患者,不同的间隔时间对其肾功能的影响无显著差异,表明早期再次 PCI 是安全可行的。

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