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D-二聚体对瘢痕子宫患者产后出血的预测价值

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[摘要] 目的: 探讨D-二聚体对瘢痕子宫患者产后出血的预测价值及瘢痕子宫患者产后出血危险因素。方法: 选择2020年5月至2022年5月南京中医药大学江阴附属医院收治的285例瘢痕子宫产妇, 将50例产后出血产妇纳入产后出血组, 将235例未发生产后出血产妇纳入无产后出血组。对比两组临床资料、产前血清D-二聚体水平, 分析D-二聚体水平对瘢痕子宫患者产后出血的预测价值, 并对瘢痕子宫患者产后出血的危险因素进行单因素、多因素回归分析。结果: 产后出血组产前血清D-二聚体水平高于无产后出血组($P<0.05$)。受试者工作特征(receiver operating characteristic, ROC)曲线分析显示: 产前血清D-二聚体水平预测瘢痕子宫患者产后出血的曲线下面积(area under the curve, AUC)为0.849, 95%CI为0.802~0.907($P<0.05$), 敏感度为0.791, 特异度为0.972。单因素分析显示: 产后出血组年龄、孕次、孕周、刮宫次数、产程延长、分娩时宫底高度、新生儿出生体重、妊娠合并症、子宫切口撕裂及宫缩乏力与无产后出血组比较, 差异均有统计学意义(均 $P<0.05$)。多因素logistic回归分析显示: 年龄、孕次、孕周、刮宫次数、分娩时宫底高度、新生儿出生体重、妊娠合并症及子宫切口撕裂均是瘢痕子宫患者产后出血的危险因素(均 $P<0.05$)。结论: 年龄、孕次、孕周、刮宫次数、分娩时宫底高度、新生儿出生体重、妊娠合并症及子宫切口撕裂是瘢痕子宫患者产后出血的危险因素, 产前血清D-二聚体水平可提早预测瘢痕子宫患者产后出血发生, 临床上可及时采取针对性措施, 改善预后。

[关键词] D-二聚体; 瘢痕子宫; 产后出血; 诊断价值; 危险因素

Predictive value of D-dimer for postpartum hemorrhage in patients with scarred uterus

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Abstract **Objective:** To investigate the predictive value D-dimer for postpartum hemorrhage in patients with scarred uterus and risk factors of postpartum hemorrhage in patients with scarred uterus. **Methods:** A total of 285 pregnant women with scarred uterus who were treated in Jiangyin Affiliated Hospital of Nanjing University of Traditional Chinese Medicine from May 2020 to May 2022 were selected, 50 women with postpartum hemorrhage were included in a postpartum hemorrhage group, and 235 women without postpartum hemorrhage were included in a

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non-postpartum hemorrhage group. The clinical data and prenatal serum *D*-dimer levels were compared between the 2 groups, and the predictive value of *D*-dimer levels for postpartum hemorrhage in patients with scarred uterus was analyzed. **Results:** The prenatal serum *D*-dimer level in the postpartum hemorrhage group was higher than that in the non-postpartum hemorrhage group ($P<0.05$). The receiver operating characteristic (ROC) curve analysis showed that the prenatal serum *D*-dimer level predicted the area under the curve (AUC) of postpartum hemorrhage in patients with scarred uterus was 0.849, 95%CI was 0.802 to 0.907 ($P<0.05$), sensitivity was 0.791, and specificity was 0.972. The single factor analysis showed that age, pregnancy times, gestational weeks, curettage times, prolonged labor process, uterine fundus height at delivery, neonatal birth weight, pregnancy complications, uterine incision tear, and uterine atony in the postpartum hemorrhage group were significantly different from those in the non-postpartum hemorrhage group (all $P<0.05$). The multivariate logistic regression analysis showed that age, pregnancy times, gestational weeks, the times of curettage, fundus height at delivery, birth weight of newborns, pregnancy complications, and uterine incision tear were the risk factors for postpartum hemorrhage in patients with scarred uterus (all $P<0.05$). **Conclusion:** Age, pregnancy times, gestational weeks, times of curettage, fundal height at delivery, birth weight of newborns, pregnancy complications, and uterine incision tear are risk factors for postpartum hemorrhage in patients with scarred uterus. Prenatal serum *D*-dimer level can predict the occurrence of postpartum hemorrhage in patients with scarred uterus in advance, and targeted measures can be taken in time to improve the prognosis in clinic.

Keywords *D*-dimer; scarred uterus; postpartum hemorrhage; diagnostic value; risk factors

随着临床诊疗技术的提升, 产后出血的预防效果也明显提升, 但产后出血仍是造成产后死亡的首要因素^[1]。近年来, 随着我国生育政策的调整及较高剖宫产率, 瘢痕子宫产妇所占比例较高, 而此类产妇再次妊娠的剖宫产率较高, 出现宫缩乏力、子宫破裂等不良事件的发生率相较于初产妇更高, 导致产后出血发生率上升^[2-3]。产后出血患者治疗成功的关键在于及时诊断, 因此有效预测并实施干预具有重要意义^[4-5]。*D*-二聚体作为交联纤维蛋白降解的终产物, 其可反映凝血功能和纤溶活性, 可间接提示机体是否存在高凝状态, 在临床上对于筛查产妇产后出血具有重要价值^[6]。本研究选取南京中医药大学江阴附属医院收治的瘢痕子宫产妇, 分析*D*-二聚体对其产后出血的预测价值, 并探究其产后出血的危险因素。

1 对象与方法

1.1 对象

选择2020年5月至2022年5月南京中医药大学江阴附属医院收治的285例瘢痕子宫产妇, 将50例产后出血产妇纳入产后出血组, 将235例未发生产后出血产妇纳入无产后出血组。纳入标准: 均为瘢痕子宫产妇, 即既往行剖宫产术; 年龄 ≥ 18 周岁; 单胎、足月; 符合2014年我国《剖宫产手术的专

家共识》^[7]中的手术指征而行剖宫产术; 产妇及家属均签署知情同意书。排除标准: 合并严重先天性心脏病; 合并严重肝肾功能不全; 合并凝血功能障碍; 合并恶性肿瘤; 合并生殖系统疾病; 合并脑血管疾病。本研究已获得南京中医药大学江阴附属医院医学伦理委员会批准(审批号: LW2020015)。

1.2 方法

1.2.1 调查方法

1) 基础资料收集。收集所有产妇基础资料, 包括年龄、孕次、孕周、刮宫次数、两次妊娠间隔时间、分娩时宫底高度、新生儿出生时体重、妊娠合并症及子宫切口撕裂。2) *D*-二聚体水平检测。取两组产妇产前24 h空腹静脉血5 mL, 使用免疫比浊法对产妇*D*-二聚体水平进行检测, 仪器为全自动血凝仪(生产厂家: 北京众驰伟业科技发展有限公司, 型号XL1000i)。

1.2.2 质量控制

所有干预人员均接受培训, 确保各知识水平、态度等方面达到合格要求, 避免发生与干预人员相关的异常情况。在发放调查表时对存在阅读困难者均采用统一标语进行解释。所有收集的患者数据资料均妥善保存与整理, 在录入数据库前反复核对, 并找另一人再次核对, 确保无误。

1.3 统计学处理

采用SPSS 22.0统计学软件进行数据分析。计量资料均符合正态分布及方差齐性,采用均数±标准差($\bar{x} \pm s$)表示,比较采用 t 检验;计数资料采用例(%)表示,比较采用 χ^2 检验;D-二聚体对产后出血的诊断价值采用受试者工作特征(receiver operating characteristic, ROC)曲线分析;产后出血的危险因素采用logistic回归分析。 $P < 0.05$ 为差异有统计学意义。

2 结果

2.1 产前血清D-二聚体水平

产后出血组产前血清D-二聚体水平为(1.96 ± 0.68) mg/L,高于无产后出血组的(1.02 ± 0.39) mg/L,差异有统计学意义($t = 13.304$, $P < 0.001$)。

2.2 产前血清D-二聚体水平对瘢痕子宫患者产后出血的预测价值

ROC曲线分析显示:产前血清D-二聚体水平预测瘢痕子宫患者产后出血的曲线下面积(area under the curve, AUC)为0.849,95%CI为0.802~0.907($P < 0.05$),敏感度为0.791,特异度为0.972,对应最佳切割点为D-二聚体取值1.596 mg/L(图1)。

2.3 瘢痕子宫患者产后出血单因素分析

单因素分析显示:产后出血组年龄、孕次、

孕周、刮宫次数、产程延长、分娩时宫底高度、新生儿出生体重、妊娠合并症、子宫切口撕裂及宫缩乏力与无产后出血组比较,差异均有统计学意义(均 $P < 0.05$,表1)。

2.4 瘢痕子宫患者产后出血多因素回归分析

多因素logistic回归分析显示:年龄、孕次、孕周、刮宫次数、分娩时宫底高度、新生儿出生体重、妊娠合并症及子宫切口撕裂均是瘢痕子宫患者产后出血的危险因素(均 $P < 0.05$,表2)。

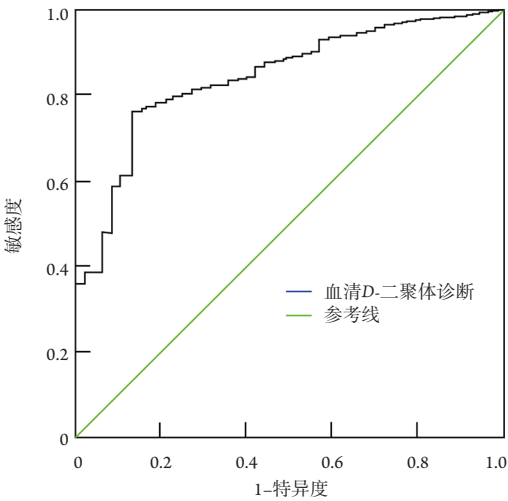


图1 产前血清D-二聚体水平预测瘢痕子宫患者产后出血的ROC曲线图

Figure 1 ROC curve of prenatal serum D-dimer level predicting postpartum hemorrhage in patients with scar uterus

表1 瘢痕子宫患者产后出血单因素分析

Table 1 Single factor analysis of postpartum hemorrhage in patients with scarred uterus

项目	产后出血组($n=50$)	无产后出血组($n=235$)	χ^2	P
年龄/[例(%)]			27.373	<0.001
<35岁	24 (48.00)	194 (82.55)		
≥ 35 岁	26 (52.00)	41 (17.45)		
孕次/[例(%)]			22.784	<0.001
<3	17 (34.00)	164 (69.79)		
≥ 3	33 (66.00)	71 (30.21)		
孕周/[例(%)]			47.542	<0.001
28~40	22 (44.00)	205 (87.23)		
>40	28 (56.00)	30 (12.77)		

续表1

项目	产后出血组(n=50)	无产后出血组(n=235)	χ^2	P
刮宫次数/[例(%)]			52.320	<0.001
<2	18 (36.00)	198 (84.26)		
≥2	32 (64.00)	37 (15.74)		
产程延长/[例(%)]			12.746	<0.001
有	17 (34.00)	31 (13.19)		
无	33 (66.00)	204 (86.81)		
两次妊娠间隔时间/[例(%)]			0.322	0.570
<2年	20 (40.00)	84 (35.74)		
≥2年	30 (60.00)	151 (64.26)		
分娩时宫底高度/[例(%)]			30.443	<0.001
<34.5 cm	21 (42.00)	188 (80.00)		
≥34.5 cm	29 (58.00)	47 (20.00)		
新生儿出生时体重/[例(%)]			20.066	<0.001
<4 000 g	29 (58.00)	201 (85.53)		
≥4 000 g	21 (42.00)	34 (14.47)		
妊娠合并症/[例(%)]			11.320	0.001
有	42 (84.00)	138 (58.72)		
无	8 (16.00)	97 (41.28)		
宫缩乏力/[例(%)]			16.009	<0.001
有	21 (42.00)	39 (16.60)		
无	29 (58.00)	196 (83.40)		
子宫切口撕裂/[例(%)]			117.119	<0.001
有	32 (64.00)	10 (4.26)		
无	18 (32.00)	225 (95.74)		

表2 瘢痕子宫患者产后出血多因素回归分析

Table 2 Multivariate regression analysis of postpartum hemorrhage in patients with scarred uterus

变量	B	SE	Wald χ^2	P	OR	95%CI
年龄	1.339	0.279	16.972	<0.001	4.015	1.337~4.987
孕次	1.472	0.356	19.013	<0.001	4.375	1.402~5.052
孕周	1.103	0.239	14.022	<0.001	2.901	1.017~4.208
刮宫次数	1.684	0.402	22.179	<0.001	5.774	1.009~6.174
产程延长	2.594	0.832	4.630	0.253	0.853	0.469~0.714
分娩时宫底高度	1.395	0.335	17.016	<0.001	4.280	1.289~5.158
新生儿出生体重	1.602	0.386	26.018	<0.001	6.682	2.024~7.284
妊娠合并症	1.799	0.404	28.106	<0.001	6.901	2.195~8.011
子宫切口撕裂	1.806	0.417	28.843	<0.001	6.924	3.025~8.731
宫缩乏力	2.163	0.767	5.128	0.195	1.696	0.597~0.891

3 讨论

产后出血指的是产妇在分娩后24 h内失血量在500 mL或剖宫产失血量在1 000 mL以上, 这是造成产妇死亡的首要因素^[8-9]。近年来, 随着多次妊娠人数的增加、剖宫产率的上升, 瘢痕子宫的发生率明显上升^[10]。虽然瘢痕子宫产妇再次行剖宫产与初次剖宫产产妇在手术方式上几乎相同, 但前者子宫切口弹性较低, 且由于切口愈合不良、宫缩不佳、肌纤维量下降及盆腔组织粘连等, 使其剖宫产后出血的发生率明显升高^[11-12]。D-二聚体可反映患者机体内已存在血栓及血栓溶解, 是反映凝血酶与纤溶酶生成的重要指标^[13-14]。通过对产妇D-二聚体的检测能够很好地预测产后出血风险。

产后出血对产妇产后健康甚至生命安全造成严重威胁, 因此尽早诊断及治疗具有重要意义。在本研究中, 产后出血组产前血清D-二聚体水平高于无产后出血组($P<0.05$), 且ROC曲线分析显示: 产前血清D-二聚体水平预测瘢痕子宫患者产后出血的AUC为0.849, 敏感度为0.791, 特异度为0.972。这表明产后出血产妇存在血液凝聚障碍情况。分析原因主要为: 女性在妊娠期由于其特殊生理状态, 血液常呈现高凝状态, 而在分娩结束后, 其血管内皮、血流动力学、纤溶功能均会出现改变, 从而引发产后出血^[15-16]。产后出血患者凝血功能通常存在异常情况, 同时D-二聚体水平明显上升, 因此临床上可以通过检测产妇D-二聚体水平从而有效预测其产后出血发生^[17-18]。在本研究中, 多因素logistic回归分析显示: 年龄、孕次、孕周、刮宫次数、分娩时宫底高度、新生儿出生体重、妊娠合并症及子宫切口撕裂均是瘢痕子宫患者产后出血的危险因素(均 $P<0.05$)。分析原因主要为: 剖宫产后瘢痕愈合良好的时间为2~3年, 而随着产妇年龄增长, 其自身肌肉组织及相关细胞会出现逐渐衰退情况, 同时组织弹性也逐渐下降, 使得产后出血风险上升; 多次分娩或刮宫次数较多者, 其子宫肌纤维受损, 从而造成子宫收缩乏力^[19]; 分娩时宫底高度过高、新生儿出生体重较重会造成子宫肌纤维伸展过度, 在分娩后肌纤维缩复能力较低, 因而易引发产后出血^[20]; 妊娠合并症、子宫切口撕裂造成产后出血的概率较高, 特别是瘢痕子宫产妇, 剖宫产对其子宫内膜和肌层均造成损伤, 使其子宫内膜血管异常生长, 在术后切口愈合时纤维组织替代原有肌层组织, 致使孕卵着床部位蜕膜形成不良, 产妇子宫肌层极易被绒毛穿透, 因此可形成前置

胎盘, 瘢痕部位更易出现胎盘粘连及植入, 增加了产后出血的发生率^[21]。

综上所述, 年龄、孕次、孕周、刮宫次数、分娩时宫底高度、新生儿出生体重、妊娠合并症及子宫切口撕裂均是瘢痕子宫患者产后出血的危险因素, 产前血清D-二聚体水平可提早预测瘢痕子宫患者产后出血发生, 临床上可及时采取针对性措施, 改善预后。但本研究不足之处在于未能充分考虑产妇凝血因素、羊水情况等, 且产后出血组与无产后出血组的组间数量差异较大, 今后应扩大样本量并作进一步分析。

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