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再次剖宫产术中出血与麻醉因素的相关性分析*

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摘要 目的:分析再次剖宫产术中出血与麻醉因素的相关性,为优化麻醉管理方案提供研究依据。**方法:**选取 1192 例再次剖宫产产妇作为研究对象,根据术中出血量将其分为研究组(术中出血量 ≥ 500 mL)和对照组(术中出血量 <500 mL)。对两组产妇术中出血的一般因素和手术麻醉因素进行对比和分析。**结果:**有 106 例产妇术中出血量 ≥ 500 mL,发生率为 8.89%,研究组产妇具有流产史比例、产前贫血比例、前置胎盘比例、胎盘粘连比例、胎盘植入比例、宫缩乏力比例高于对照组,孕程短于对照组,差异均有统计学意义($P<0.05$)。研究组产妇的手术时间、子宫切除或部分切除比例、美国麻醉医师协会(ASA) II~III 级比例、罗哌卡因用量 >15 mg 比例高于对照组,差异均有统计学意义($P<0.05$)。Logistic 多元回归分析结果显示,再次剖宫产产妇术中出血的发生与前置胎盘、胎盘植入、宫缩乏力、子宫切除或部分切除及 ASA 分级具有相关性($P<0.05$)。**结论:**再次剖宫产术中出血风险不仅与胎盘、子宫因素有关,而且受手术和麻醉因素的影响,临床医生应对产妇进行全面和准确的术前评估,优化麻醉管理方案和手术策略,从而减少术中出血的发生,确保手术的安全性。

关键词:再次剖宫产;术中出血;麻醉;相关因素

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Analysis on Correlation Between Intraoperative Hemorrhage and Anesthesia Factors during Repeat Cesarean Section*

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ABSTRACT Objective: To analyze the correlation between intraoperative hemorrhage and anesthesia factors during the repeat cesarean section to provide research basis for optimizing anesthesia management program. **Methods:** A total of 1192 parturient women, who underwent cesarean section again, were selected and divided into study group (the amount of intraoperative hemorrhage ≥ 500 mL) and control group (the amount of intraoperative hemorrhage <500 mL) according to the amount of intraoperative hemorrhage. The general factors and anesthesia factors related to intraoperative hemorrhage between the two groups of parturient women were compared and analyzed. **Results:** The amount of intraoperative hemorrhage of 106 cases ≥ 500 mL, the incidence was 8.89%. The proportion of abortion history, the proportion of prenatal anemia, the proportion of placenta previa, the proportion of placenta adhesion, the proportion of placenta implantation, the proportion of uterine atony of the parturient women in the study group were higher than those in the control group, and the pregnancy process was shorter than that in the control group, the differences were statistically significant ($P<0.05$). The time of operation, the proportion of hysterectomy or partial hysterectomy, the proportion of ASA II ~ III grade and the proportion of ropivacaine dosage > 15 mg of the parturient women in the study group were significantly higher than those in the control group, the differences were statistically significant($P<0.05$). The results of logistic multiple regression analysis showed that the occurrence of intraoperative hemorrhage during the repeat cesarean section was correlated with placenta previa, placenta implantation, uterine atony, hysterectomy or partial resection and ASA grade ($P<0.05$). **Conclusions:** The risk of intraoperative hemorrhage during the repeat cesarean section is not only related to placental and uterine factors, but also affected by operation and anesthesia factors. The clinician should make a comprehensive and accurate preoperative evaluation on the parturient women, optimize anesthesia management plan and operation strategy, so as to reduce the occurrence of intraoperative hemorrhage and ensure the safety of operation.

Key words: Repeat cesarean section; Intraoperative hemorrhage; Anesthesia; Related factors

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前言

剖宫产是临床上终止高危妊娠的主要方式,虽然临床工作者一直努力降低无指征剖宫产率,但我国的剖宫产率仍然较高,随着我国二胎政策的全面放开,剖宫产术后再次妊娠人数呈现逐年增加,此类产妇更易发生子宫破裂,且阴道试产机率较低,故剖宫产仍然是其首选分娩方式^[1-3]。再次剖宫产可能出现术中及产后出血、软产道及邻近器官损伤、产后感染等并发症,严重者可导致产妇死亡^[4-6]。相对于初次剖宫产产妇,再次剖宫产产妇的术中出血风险较高,如不及时采取紧急处理措施,极有可能导致产妇出现失血性休克进而危及产妇生命安全^[7],因此,临床医生必须对再次剖宫产产妇术中出血的相关风险因素进行有效识别、全面评价及合理干预,从而减少其发生率。近年来,研究者针对这一问题进行了大量研究,先后发现了胎盘因素、切口因素、宫缩因素、子宫破裂因素、两次剖宫产相距时间、腹腔粘连、术式等均可对再次剖宫产术中出血风险产生影响^[8,9],但较少研究者对麻醉相关因素给予关注,这不利于通过优化麻醉管理进一步减少再次剖宫产术中出血,基于这一现状,本研究针对再次剖宫产术中出血与麻醉因素的相关性进行了研究和分析,现报告如下:

1 资料与方法

1.1 研究资料

选取2018年12月-2019年12月在乐山市人民医院妇产科行再次剖宫产手术的1192例产妇作为研究对象,对其术中出血情况及相关因素进行回顾性分析。

1.1.1 纳入标准 所有产妇均具有既往剖宫产术史及再次行剖宫产术指征,由同一组产科医生进行手术,均为横切口术式,麻醉方式均采用0.894%甲磺酸罗哌卡因复合右美托咪定、舒芬太尼或芬太尼行椎管内麻醉,均为活产单胎妊娠,美国麻醉

医师协会(ASA)分级为I~III级,临床资料完整。

1.1.2 排除标准 合并恶性肿瘤、心脑血管、凝血功能障碍、血液疾病的患者;孕程<28周及术前有应用抗凝药物史的患者。

1.2 观察指标

1.2.1 术中出血情况调查 通过查阅病案对所有产妇术中出血情况进行调查,将术中出血量 ≥ 500 mL者判定为术中明显出血,纳入研究组,将术中出血量<500 mL者判定为术中未见明显出血,纳入对照组。

1.2.2 一般因素调查 对两组产妇的年龄、体质指数(BMI)、既往剖宫产次数、孕程、流产史、距前次剖宫产时间间隔、产前贫血、血小板减少、子宫肌瘤、妊娠并发症、先兆子宫破裂、胎膜早破、前置胎盘、胎盘粘连、胎盘植入、宫缩乏力等一般因素进行对比和分析。

1.2.3 手术及麻醉因素调查 对两组产妇的手术时间、手术体位、子宫切除或部分切除情况、术中保温、ASA分级、麻醉穿刺部位、麻醉穿刺体位、罗哌卡因用量等手术麻醉因素进行调查和分析。

1.3 统计学分析

采用SPSS 22.0统计软件进行分析,连续、服从正态分布的计量资料采用 $(\bar{x} \pm s)$ 的形式,两样本均数比较采用独立样本t检验,率或构成比的比较采用 χ^2 检验或Fisher确切概率法,单因素分析有差异的因素纳入多因素分析,多因素分析采用Logistic多元回归模型分析,以 $P<0.05$ 为差异有统计学意义。

2 结果

2.1 两组产妇一般因素的比较

有106例产妇术中出現明显出血,发生率为8.89%,研究组产妇具有流产史比例、产前贫血比例、前置胎盘比例、胎盘粘连比例、胎盘植入比例、宫缩乏力比例高于对照组,孕程短于对照组,两组之间的差异均有统计学意义($P<0.05$)。见表1。

表1 两组产妇一般因素的比较
Table 1 Comparison on general data between two groups of parturient women

Factors		Study group (n=106)	Control group (n=1086)	χ^2/t	P
Age		32.26 $\pm$ 4.75	31.78 $\pm$ 4.91	0.963	0.103
BMI(kg/m ²)		27.56 $\pm$ 3.86	27.81 $\pm$ 3.69	0.663	0.342
Previous cesarean section times	1	94	1010	2.639	0.104
	>1	12	76		
Gestational period (weeks)		36.64 $\pm$ 2.71	38.16 $\pm$ 1.53	8.955	<0.001
History of abortion	Yes	92	759	13.510	<0.001
	No	14	327		
Interval from previous cesarean section (years)		6.58 $\pm$ 2.19	6.42 $\pm$ 2.57	0.619	0.375
Myoma of uterus	Yes	5	48	-	0.806
	No	101	1038		
Gestational diabetes mellitus	Yes	16	165	0.001	0.978
	No	90	921		
Gestational hypertension	Yes	4	42	0.002	0.963
	No	102	1044		

Eclampsia	Yes	3	28	-	0.751
	No	103	1058		
Prenatal anemia	Yes	17	58	18.742	<0.001
	No	89	1028		
Thrombocytopenia	Yes	4	33	-	0.564
	No	102	1053		
Threatened uterine rupture	Yes	8	79	0.011	0.918
	No	98	1007		
Premature rupture of membranes	Yes	11	106	0.042	0.839
	No	95	980		
Placenta previa	Yes	56	15	456.354	<0.001
	No	50	1071		
Placental adhesion	Yes	32	55	90.098	<0.001
	No	74	1031		
Placenta accreta	Yes	24	13	147.658	<0.001
	No	82	1073		
Uterine atony	Yes	26	38	84.056	<0.001
	No	80	1048		

Note: "-":Fisher exact probability method is applied and there is no χ^2 .

2.2 两组产妇手术及麻醉因素的比较

研究组产妇的手术时间、子宫切除或部分切除比例、ASA

II~III级比例、罗哌卡因用量 > 15 mg 比例高于对照组, 差异均有统计学意义($P<0.05$)。见表 2。

表 2 两组产妇手术及麻醉因素的比较

Table 2 Comparison of operation and anesthesia factors between two groups of parturient women

Factors		Study group (n=106)	Control group (n=1086)	χ^2/t	P
Operation time (min)		118.12± 31.15	79.06± 23.37	15.980	<0.001
Operation position	supine position	76	782	1.118	0.572
	Left tilt position	21	183		
	Left tilt combined with foot high head down	9	121		
Hysterectomy or partial hysterectomy	Yes	3	0	-	0.001
	No	103	1086		
Intraoperative heat preservation	Conventional insulation	82	835	0.012	0.913
	Multi mode insulation	24	251		
ASA classification	I	49	1021	240.056	<0.001
	II~III	57	65		
Anesthesia puncture site	L2-3	31	257	1.641	0.200
	L3-4	75	829		
Anesthesia puncture position	Left recumbent position	72	756	0.130	0.719
	Right recumbent position	34	330		
Dosage of ropivacaine (mg)	>15	65	404	23.543	<0.001
	≤ 15	41	682		

2.3 再次剖宫产产妇术中出血的多因素分析

以单因素分析差异具有统计学意义的因素为自变量, 以是否出现术中明显出血为因变量, 进行 Logistic 多元回归分析,

自变量赋值情况见表 3。结果显示, 再次剖宫产产妇术中出血的发生与前置胎盘、胎盘植入、宫缩乏力、子宫切除或部分切除及 ASA 分级具有相关性($P<0.05$)。见表 4。

表 3 Logistic 多元回归分析自变量赋值情况

Table 3 Assignment of independent variables in logistic multiple regression analysis

Independent variable	Assignment
History of abortion	"Yes" = 1 "No" = 0
Prenatal anemia	"Yes" = 1 "No" = 0
Placenta previa	"Yes" = 1 "No" = 0
Placental adhesion	"Yes" = 1 "No" = 0
Placenta accreta	"Yes" = 1 "No" = 0
Uterine atony	"Yes" = 1 "No" = 0
Gestational period	continuous variable
Operation time	continuous variable
Hysterectomy or partial hysterectomy	"Yes" = 1 "No" = 0
ASA classification	"II~III"=1 "I"=0
Dosage of ropivacaine	">15 mg"=1 "≤ 15 mg"=0

表 4 再次剖宫产产妇术中出血相关因素的 Logistic 多元回归分析

Table 4 Logistic multiple regression analysis on related factors of intraoperative bleeding in parturient women undergoing caesarean section again

Variables	β	Standard error	OR	95% confidence interval of OR	Wald χ^2	P
History of abortion	0.107	0.439	1.302	0.442~2.162	0.968	0.539
Prenatal anemia	0.069	0.203	1.039	0.641~1.437	0.725	0.719
Placenta previa	0.915	0.306	2.269	1.669~2.869	37.739	<0.001
Placental adhesion	0.113	0.375	1.235	0.500~1.970	1.678	0.196
Placenta accreta	0.663	0.219	1.675	1.246~2.104	15.013	<0.001
Uterine atony	0.875	0.227	1.996	1.551~2.441	22.087	<0.001
Gestational period	-0.097	0.333	0.913	0.260~1.566	1.112	0.221
Operation time	0.003	0.113	1.006	0.785~1.227	1.069	0.499
Hysterectomy or partial hysterectomy	1.126	0.411	3.069	2.263~3.875	49.668	<0.001
ASA classification	1.038	0.354	2.716	2.022~3.410	31.166	<0.001
Dosage of ropivacaine	0.139	0.139	1.019	0.747~1.291	1.894	0.182

3 讨论

本研究结果显示,前置胎盘、胎盘植入、宫缩乏力等胎盘和宫缩因素是影响再次剖宫产术中出血风险的独立因素,这与近年来的研究^[10,11]结果基本一致。学术界普遍认为,在诸多影响因素中,前置胎盘和胎盘植入是影响再次剖宫产术中出血风险的最重要因素^[12,13]。临床上通常将剖宫产术后再次妊娠中的前置胎盘称为凶险性前置胎盘,我国目前约有一半产妇的分娩方式为剖宫产,较高的剖宫产率导致了再次妊娠中的凶险性前置胎盘合并胎盘植入的发生率不断提升^[14,15]。在此类产妇的剖宫产术中,由于胎盘植入部分具有开放性血窦,故针对胎盘植入部分的剥离操作易导致大量出血,产妇可在短时间内出现失血性休克^[6],此时即使给予结扎髂内或子宫动脉,也难以完全阻断植入胎盘的血供,处理难度较大,产妇生命安全可受到严重的威胁^[7],合并凶险性前置胎盘、胎盘植入的剖宫产术中出血也被列为重要的产科急危重症之一^[18]。因此,针对再次剖宫产产妇的胎盘、子宫状态进行准确全面的术前评价具有十分重要的

意义,还要做好术中的紧急处置准备,从而全力确保手术的安全性。

本研究结果显示,子宫切除或部分切除、ASA 分级是影响再次剖宫产术中出血风险的独立因素。近年来,仅有少数研究^[19]针对麻醉因素对再次剖宫产术中出血风险的影响进行了分析,但该研究仅对比了全麻和椎管内麻醉的风险,结果显示 ASA 分级较高、全麻可提升术中出血风险,而未支持子宫切除或部分切除可对术中出血风险产生影响的结论,这一差异的产生可能与选取的研究对象不同有关。在本研究中,选取了椎管内麻醉产妇作为研究对象,主要原因是在临床上全麻下行剖宫产手术的病例较少,除产妇强烈要求和具有椎管内麻醉禁忌外,剖宫产术一般均应用椎管内麻醉,故本研究排除了全麻手术产妇,这可能导致了术中出血影响因素的差异。ASA 分级是根据患者的麻醉前体质状况对手术麻醉危险性进行分类的体系,共分为六级。I 级患者的各器官功能正常,而 II~III 级患者具有不同程度的并发症,ASA 分级与外科手术并发症的风险密切相关^[20],本研究支持了较高的 ASA 分级可导致产妇术中出血

风险升高的结论,其原因可能是这部分产妇合并有妊娠合并症、器官功能储备差,易出现宫缩乏力或先兆子宫破裂,而这又进一步提升了术中出血风险。

通过本研究结果可见,虽然罗哌卡因用量不是影响再次剖宫产术中出血风险的独立因素,但可能也与术中出血具有一定的关联性。罗哌卡因是剖宫产术椎管内麻醉的常用药物,能够达到与布比卡因等相近的麻醉效果,且具有麻醉不良反应较少的优势^[21,22]。而在本研究结果提示了较大的罗哌卡因用量可能与术中出血的发生有关,其原因可能是大剂量罗哌卡因加剧了对产妇血流动力学指标的不良影响,近年来的研究^[23,24]已证实,在剖宫产手术麻醉中应用小剂量罗哌卡因,能够在获得与大剂量用药相当的麻醉效果的同时稳定产妇的血流动力学指标和血氧饱和度,并可缩短感觉和运动阻滞起效时间。因此,在再次剖宫产术中的麻醉管理中,应考虑在保证麻醉效果的前提下适当减少罗哌卡因用量,从而减少对产妇血流动力学状态的不良影响^[25,26]。在本研究的麻醉方案中,以右美托咪定、舒芬太尼或芬太尼作为罗哌卡因麻醉的辅助用药,右美托咪定在镇痛效果、降低恶心呕吐及寒战发生率方面略优于芬太尼^[7],罗哌卡因复合右美托咪定的麻醉方案在剖宫产中应用,可保持稳定的血流动力学和应激反应水平^[28],故临床上更为常用。罗哌卡因复合舒芬太尼或芬太尼的麻醉方案在剖宫产术中的应用也比较常见,但在应用时需要合理确定舒芬太尼或芬太尼的用量^[29]。总之,在再次剖宫产术的麻醉管理中,应根据患者的基础状态和围术期反应合理地制订术中麻醉方案和术后镇痛方案,从而确保手术的安全性,促进产妇的康复。

值得提出是,近年来的研究提示,椎管内麻醉方式也是影响剖宫产术中出血风险的因素^[30],但本研究未对腰-硬联合麻醉、硬膜外阻滞麻醉等不同椎管内麻醉方式对再次剖宫产术中出血风险的影响进行对比和评价,这是本研究不足之处,将在后续研究中予以补充和讨论。

综上所述,再次剖宫产术中出血风险不仅与胎盘、子宫因素有关,而且受手术和麻醉因素的影响,临床医生应对产妇进行全面和准确的术前评估,优化麻醉管理方案和手术策略,从而减少术中出血的发生,确保手术的安全性。

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