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## 蛛网膜下腔麻醉在剖宫产麻醉中的应用效果 及对泌乳素、IL-10 及循环系统的影响\*

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**摘要 目的:**探讨蛛网膜下腔麻醉在剖宫产麻醉中的应用效果及对泌乳素、白细胞介素 10(IL-10)及循环系统的影响。**方法:**选择 2019 年 6 月-2021 年 6 月在我院接受治疗的 120 例剖宫产产妇,采用随机数表法分为试验组(n=61)和对照组(n=59)。对照组给予连续性硬膜外麻醉,试验组蛛网膜下腔麻醉。比较两组麻醉情况、泌乳素、IL-10、心率(HR)、收缩压(SBP)及舒张压(DBP)、去甲肾上腺素(NE)、肾上腺素(E)、多巴胺(DA)水平变化情况及不良反应发生情况。**结果:**试验组感觉阻滞起效、运动阻滞起效时间均显著低于对照组,感觉阻滞维持、运动阻滞维持时间均高于对照组( $P<0.05$ );术前,试验组和对照组血清泌乳素、IL-10 比较无显著性差异;术后,试验组血清泌乳素、IL-10 均高于对照组,具有显著性差异( $P<0.05$ );术前,试验组和对照组 HR、SBP 及 DBP 比较无显著性差异;术后,试验组和对照组 HR、SBP 及 DBP 均有所降低,两组间无显著性差异( $P>0.05$ );术前,两组应激反应水平无显著性差异;术后试验组和对照组 NE、E、DA 水平均有所升高,且试验组上述指标均显著低于对照组,具有显著性差异( $P<0.05$ );两组不良反应总发生率为 4.92%、8.47%,无显著性差异( $P>0.05$ )。**结论:**在剖宫产中应用蛛网膜下腔麻醉效果显著,可有效改善产妇泌乳素、IL-10 水平。

**关键词:**蛛网膜下腔麻醉;剖宫产;泌乳素;白细胞介素 10;循环系统

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## Effect of Subarachnoid Anesthesia in Cesarean Section and Its Effect on Prolactin, IL-10 and Circulatory System\*

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**ABSTRACT Objective:** To study Effect of subarachnoid anesthesia in cesarean section and its effect on prolactin, Interleukin 10 (IL-10) and circulatory system. **Methods:** 120 cesarean section patients treated in our hospital from June 2019 to June 2021 were selected and divided into experimental group (n=61) and control group (n=59) by random number table method. The control group received continuous epidural anesthesia, and the experimental group received subarachnoid anesthesia. Anesthesia, prolactin, IL-10, heart rate (HR), systolic blood pressure (SBP), diastolic blood pressure (DBP), norepinephrine (NE), epinephrine (E), dopamine (DA) levels and the occurrence of adverse reactions were compared between the two groups. **Results:** The onset time of sensory block and motor block in experimental group were significantly lower than those in control group, and the maintenance time of sensory block and motor block in experimental group were significantly higher than those in control group ( $P<0.05$ ). Before operation, there were no significant differences in serum prolactin and IL-10 between experimental group and control group. After operation, serum prolactin and IL-10 in experimental group were significantly higher than those in control group ( $P<0.05$ ); Before operation, there were no significant differences in HR, SBP and DBP between experimental group and control group. After operation, HR, SBP and DBP of experimental group and control group were decreased, but there were no significant differences between the two groups ( $P>0.05$ ). Before surgery, there was no significant difference in stress response between the two groups. The levels of NE, E and DA in experimental group and control group were increased after operation, and the above indexes in experimental group were significantly lower than those in control group, the difference was significant ( $P<0.05$ ); The total incidence of adverse reactions between the two groups was 4.92% and 8.47%, with no significant difference ( $P>0.05$ ). **Conclusion:** Subarachneid anesthesia in cesarean section has significant effect and can effectively improve the levels of prolactin and IL-10.

**Key words:** Subarachnoid anesthesia; Cesarean section; Prolactin; Interleukin 10; The circulatory system

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## 前言

剖宫产是帮助产妇分娩的一种手术方案,手术有一定的益处,但相对顺产的产妇而言,剖宫产术中出血、子宫破裂等几率较高,近年来随着医疗技术的飞速发展,剖宫产术越来越多,但剖宫产术后对产妇造成的疼痛问题日益突出,产后疼痛可促使产妇分泌神经递质,产生炎性因子,从而延长疼痛时间<sup>[1-4]</sup>。泌乳素是一种多肽激素,在妇女怀孕后其水平升高,IL-10 是一种多功能的细胞因子,参与炎症反应,是目前公认的炎症抑制因子,在手术时可导致机体发生强烈应激反应,导致炎症因子的分泌<sup>[5,6]</sup>。因此,在行剖宫产术时选择合理的麻醉方式具有重要意义。剖宫产手术技术成熟,操作时间短,因此对麻醉的要求较高,要求诱导时间短、麻醉效果确切、阻滞完善,临床多采用椎管内麻醉的方式,椎管内麻醉可在短时间内起效,获得良好的镇痛效果<sup>[7,8]</sup>。蛛网膜下腔麻醉是临床较为常见的椎管内麻醉方式,具有起效快、安全性高、麻醉效果好等优点,是临床多种手术常用的麻醉方式<sup>[9]</sup>。本研究旨在探讨蛛网膜下腔麻醉在剖宫产麻醉中的应用效果,并分析其对泌乳素、IL-10 及循环系统的影响。

## 1 资料与方法

### 1.1 一般资料

选择 2019 年 6 月 -2021 年 6 月在我院接受治疗的 120 例剖宫产产妇,采用随机数表法分为 2 组,试验组 61 例,年龄 21~35 岁,平均(26.25±2.41)岁,孕周 37~40 周,平均(39.02±0.91)周,体重 57~82 kg。平均(65.07±3.24)kg,ASA 分级:II 级 45 例,III 级 16 例;对照组 59 例,年龄 21~37 岁,平均(26.31±2.45)岁,孕周 37~41 周,平均(39.07±0.93)周,体重 55~82.5 kg。平均(65.11±3.31)kg,II 级 43 例,III 级 16 例,两组产妇临床一般资料无显著性差异( $P>0.05$ ),具有可比性。

纳入标准:(1)无凝血功能障碍;(2)无长期服用影响检测结果的药物;(3)临床资料完整;(4)对本次研究药物无过敏者;

(5)无其他严重疾病;(6)产妇签署知情同意书。排除标准:(1)患有意识障碍、精神障碍者;(2)严重肺部及心脏病变者;(3)合并重要脏器功能疾病;(4)血液感染性疾病;(5)术中子宫切口裂伤;(6)存在手术禁忌证者;(7)重症有生命危险产妇;(8)依从性较差者。

### 1.2 方法

对照组给予连续性硬膜外麻醉:产妇处侧卧位,L1-2 间隙,穿刺针依次穿过皮下、棘上韧带、棘间韧带、黄韧带至硬膜外腔,置入硬膜外导管,退出穿刺针,导管内注射 2% 的利多卡因(规格:5 mL:0.1 g;生产厂家:山西晋新双鹤药业有限责任公司;国药准字:H11022295)4 mL,5 分钟后无异常且出现麻醉平面后再注入 1%利多卡因与 0.5%罗哌卡因(规格:10 mL:100 mg;生产厂家:AstraZeneca;进口药品注册证号:H20140763)合剂 8-12 mL。试验组给予蛛网膜下腔麻醉:侧卧位,L2-3 间隙,单次腰麻针穿刺硬脊膜、蛛网膜至蛛网膜下腔,0.5%罗哌卡因 10-12 mg 注射至蛛网膜下腔。

### 1.3 观察指标

采集空腹静脉血 5 mL,以 3000 r·min<sup>-1</sup> 速度离心 10 min,提取上层血清后,采用双抗体夹心酶联免疫吸附法测定泌乳素、IL-10、NE、E、DA 水平;观察记录 HR、SBP 及 DBP;观察记录并发症发生情况。

### 1.4 统计学分析

以 spss24.0 软件包处理,计量资料均为正态分布,用均数±标准差( $\bar{x} \pm s$ )表示,比较使用独立样本 t 检验,计数资料以率表示, $\chi^2$  检验, $P<0.05$  表示差异具有统计学意义。

## 2 结果

### 2.1 两组麻醉情况比较

试验组感觉阻滞起效、运动阻滞起效时间均显著低于对照组,感觉阻滞维持、运动阻滞维持时间均高于对照组( $P<0.05$ )详见表 1。

表 1 两组麻醉情况比较( $\bar{x} \pm s$ , min)

Table 1 Comparison of anesthesia between the two groups( $\bar{x} \pm s$ , min)

| Groups             | n  | Onset time of sensory | Duration of sensory | Onset time of exercise | Maintenance time of |
|--------------------|----|-----------------------|---------------------|------------------------|---------------------|
|                    |    | block                 | block               | block                  | exercise block      |
| Experimental group | 61 | 4.12±1.34             | 192.25±50.21        | 6.93±1.67              | 151.85±41.28        |
| Control group      | 59 | 5.21±1.47             | 171.29±47.56        | 8.36±2.14              | 124.41±35.23        |
| t value            |    | 4.247                 | 2.346               | 4.088                  | 3.911               |
| P value            |    | 0.000                 | 0.021               | 0.000                  | 0.000               |

### 2.2 两组泌乳素、IL-10 水平比较

术前,试验组和对照组血清泌乳素、IL-10 比较无显著性差

异;术后,试验组血清泌乳素、IL-10 均高于对照组,具有显著性差异( $P<0.05$ ),见表 2。

表 2 两组泌乳素、IL-10 水平比较( $\bar{x} \pm s$ )

Table 2 Comparison of prolactin and IL-10 levels between the two groups( $\bar{x} \pm s$ )

| Groups             | n  | prolactin(mIU/L) |               | IL-10(pg/mL) |               |
|--------------------|----|------------------|---------------|--------------|---------------|
|                    |    | Preoperative     | Postoperative | Preoperative | Postoperative |
| Experimental group | 61 | 363.15±10.65     | 341.24±10.78  | 28.65±0.36   | 44.15±1.25    |
| Control group      | 59 | 363.41±10.84     | 254.27±10.89  | 28.69±0.42   | 35.56±1.36    |
| t value            |    | 0.133            | 43.962        | 0.561        | 36.042        |
| P value            |    | 0.895            | 0.000         | 0.576        | 0.000         |

### 2.3 两组循环系统水平比较

术前, 试验组和对照组 HR、SBP 及 DBP 比较无显著性差

异; 术后, 试验组和对照组 HR、SBP 及 DBP 均有所降低, 两组间比较无显著性差异 ( $P>0.05$ ) 见表 3。

表 3 两组循环系统水平比较 ( $\bar{x} \pm s$ )

Table 3 Comparison of circulatory system levels between the two groups ( $\bar{x} \pm s$ )

| Groups             | n  | HR(time /min) |               | SBP(mmHg)    |               | DBP(mmHg)    |               |
|--------------------|----|---------------|---------------|--------------|---------------|--------------|---------------|
|                    |    | preoperative  | postoperative | preoperative | postoperative | preoperative | postoperative |
| Experimental group | 61 | 88.67±10.12   | 82.15±11.41   | 123.12±10.14 | 108.54±13.51  | 76.59±8.12   | 64.26±9.25    |
| Control group      | 59 | 88.72±10.21   | 83.87±9.89    | 122.98±10.16 | 110.45±12.78  | 76.62±8.14   | 65.48±9.25    |
| t value            |    | 0.027         | 0.881         | 0.076        | 0.795         | 0.020        | 0.722         |
| P value            |    | 0.979         | 0.380         | 0.939        | 0.428         | 0.984        | 0.472         |

### 2.4 两组应激反应检查结果比较

术前, 两组应激反应水平无显著性差异; 术后试验组和对

照组 NE、E、DA 水平均有所升高, 且试验组上述指标均显著低于对照组, 具有显著性差异 ( $P<0.05$ ) 见表 4。

表 4 两组应激反应检查结果比较 ( $\bar{x} \pm s$ , ng/L)

Table 4 Comparison of stress response test results between the two groups ( $\bar{x} \pm s$ , ng/L)

| Groups             | n  | NE           |               | E            |               | DA           |               |
|--------------------|----|--------------|---------------|--------------|---------------|--------------|---------------|
|                    |    | preoperative | postoperative | preoperative | postoperative | preoperative | postoperative |
| Experimental group | 61 | 118.72±29.87 | 162.14±33.42  | 57.12±16.08  | 88.15±18.21   | 56.32±14.64  | 70.51±18.21   |
| Control group      | 59 | 118.75±29.93 | 203.52±35.01  | 56.97±16.25  | 119.68±18.78  | 56.27±14.46  | 91.73±20.12   |
| t value            |    | 0.005        | 6.624         | 0.051        | 9.338         | 0.019        | 6.061         |
| P value            |    | 0.996        | 0.000         | 0.959        | 0.000         | 0.985        | 0.000         |

### 2.5 临床安全性分析

两组不良反应总发生率为 4.92%、8.47%, 无显著性差异

( $P>0.05$ ), 见表 5。

表 5 临床安全性分析

Table 5 Clinical safety analysis [n(%)]

| Groups             | n  | Nausea | vomiting | chills | Have a headache | The total incidence of |
|--------------------|----|--------|----------|--------|-----------------|------------------------|
| Experimental group | 61 | 1      | 1        | 1      | 0               | 3(4.92)                |
| Control group      | 59 | 1      | 2        | 1      | 1               | 5(8.47)                |
| $\chi^2$ value     |    |        |          |        |                 | 0.609                  |
| P value            |    |        |          |        |                 | 0.435                  |

## 3 讨论

剖宫产是产科领域中十分重要的手术, 是通过切开孕妇的腹部达到娩出胎儿的目的, 随着我国经济的发展, 人们对于健康的意识也不断提高, 为保证产妇及宝宝的安全, 剖宫产已成为解决难产、挽救产妇生命的有效手段<sup>[10-13]</sup>。但有研究显示, 剖宫产术后急性疼痛发生率较高, 引起孕妇应激反应, 影响切口的愈合, 因此, 选择合适的镇痛方式具有重要意义<sup>[14]</sup>。

剖宫产手术时间较短, 对麻醉方式的要求相对较高, 在制定麻醉方案时应考虑产妇和胎儿的状态, 将对产妇及胎儿的影响降至最低, 目前临床多采用椎管内麻醉<sup>[15-17]</sup>。椎管内麻醉主要通过细的腰穿针降低产妇头痛率, 阻滞范围为胸腹部及双下肢, 能保持血压稳定, 比较适合剖宫产手术<sup>[18]</sup>。而蛛网膜下腔麻醉和连续性硬膜外麻醉是目前临床常用的两种椎管内麻醉方式, 其中连续性硬膜外麻醉指硬膜外间隙阻滞麻醉, 主要是将

局麻药注入硬膜外腔, 阻滞脊神经根, 从而达到麻醉的目的, 具有易控制、操作简单等优势<sup>[19-21]</sup>。但有学者发现, 连续性硬膜外麻醉在剖宫产手术中可导致产妇出现交感神经阻滞, 且可发生牵拉反应、麻醉不完全等情况<sup>[22]</sup>。蛛网膜下腔麻醉是将局麻药直接注入蛛网膜下腔, 阻滞脊神经根的麻醉方法, 能舒张血管, 抑制交感神经兴奋, 具有镇痛时间长、起效快等优势<sup>[23-26]</sup>。本研究结果显示, 蛛网膜下腔麻醉的产妇感觉阻滞起效、运动阻滞起效时间均显著低于对照组, 感觉阻滞维持、运动阻滞维持时间均高于对照组, 结果说明, 蛛网膜下腔麻醉在剖宫产麻醉中效果显著, 能提高麻醉效果。Abhishek M S<sup>[27]</sup>等研究也显示, 蛛网膜下腔麻醉能有效维持麻醉效果, 药物吸收量稍高, 导致其恢复阻滞平面的时间也稍长, 与本研究结果相似。

泌乳素也称催乳素, 是一种多肽蛋白激素, 是引起并维持泌乳的最主要因素, 在妊娠 3 个月时开始分泌泌乳素, 促进乳腺发育, 维持泌乳, 有研究显示, 剖宫产术后常伴有切口疼痛,

引起交感神经兴奋,而儿茶酚胺增多可抑制泌乳素分泌,降低乳汁分泌水平<sup>[28,29]</sup>。术后疼痛是抑制产妇泌乳素分泌的主要原因,因此给予产妇良好的镇痛可缓解产妇疼痛,促进泌乳素分泌,对产妇术后康复具有重要意义<sup>[30,31]</sup>。有研究显示,在剖宫手术中可导致产妇体内 IL-10 等炎症水平升高<sup>[32]</sup>。IL-10 是一种多功能的细胞因子,是公认的炎症与免疫抑制因子,能调节细胞的生长与分化,在手术时可刺激患者体内炎症因子升高,影响患者术后恢复<sup>[33]</sup>。本研究结果显示,蛛网膜下腔麻醉产妇体内血清泌乳素、IL-10 均高于对照组,结果提示,蛛网膜下腔麻醉能缓解产妇术后疼痛程度,降低体内炎症因子的释放。分析其原因可能是因为蛛网膜下腔麻醉能够有效延长缓解产妇术后疼痛的时间,给予麻醉药物后药物可透过硬脊膜,至蛛网膜下腔,发挥镇痛持久的作用,从而缓解疼痛程度。本研究结果还显示,术后产妇 HR、SBP 及 DBP 均有所降低,但两组间比较无显著性差异;NE、E、DA 水平均有所升高,且给予蛛网膜下腔麻醉的产妇低于对照组,结果提示,蛛网膜下腔麻醉在剖宫产麻醉中效果显著,手术可导致产妇体内应激反应升高,但给予蛛网膜下腔麻醉的产妇应激反应低于对照组,本研究结果还显示,两组产妇不良反应无明显差异。分析其原因可能是因为蛛网膜下腔麻醉能有效维持麻醉效果,产妇达到最大感觉阻滞平面时间,减弱产妇疼痛感,从而减少对机体应激反应的刺激。但值得注意的是对剖宫产产妇进行蛛网膜下腔麻醉进行穿刺时,切忌用力过猛;对于穿刺难度较大的产妇,及时调整穿刺体位、改换穿刺位置。

综上所述,在剖宫产中应用蛛网膜下腔麻醉效果显著,可有效改善产妇泌乳素和 IL-10 的水平。

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