本文引用:曹雅军,吴文春,董敏,等. 不同硬膜外麻醉方案对初产妇疼痛和产后盆底功能的影响[J]. 新乡医学院学报,2023,40(12):1146-1150. DOI:10.7683/xxyxyxb.2023.12.009.

【临床研究】

不同硬膜外麻醉方案对初产妇疼痛和产后盆底功能的影响

曹雅军, 吴文春, 董 敏, 严 霞
(湖北中医药大学附属襄阳医院麻醉科,湖北 襄阳 441000)

摘要: **目的** 观察不同硬膜外麻醉方案对初产妇分娩疼痛和产后盆底功能的影响。**方法** 选择 2021 年 9 月至 2022 年 9 月在湖北中医药大学附属襄阳医院进行硬膜外麻醉无痛分娩的 80 例初产妇为研究对象,按照麻醉方案将产妇分为对照组($n=40$)和观察组($n=40$)。对照组产妇予以罗哌卡因复合生理盐水硬膜外麻醉,观察组产妇予以罗哌卡因复合舒芬太尼硬膜外麻醉。比较 2 组产妇自然分娩率、剖宫产率、阴道助产率及各个产程的时间;分别于镇痛后 5 min、60 min、宫口全开以及产后 24 h 时采用疼痛视觉模拟评分法(VAS)评估 2 组产妇的镇痛效果;分别于出生后 1 min 和 5 min 采用新生儿 Apgar 评分评估 2 组新生儿窒息情况;记录 2 组产妇恶心呕吐、宫颈或会阴损伤、尿潴留及新生儿窒息等并发症发生情况并比较并发症总发生率。于分娩后 6 ~ 8 周采用生物刺激反馈仪检测 2 组产妇的纤维肌力、盆底肌闭合收缩力、盆底肌静态张力等盆底功能指标。**结果** 对照组产妇的自然分娩率、阴道助产率及剖宫产率分别为 72.5%(29/40)、7.5%(3/40)、20.0%(8/40),观察组产妇的自然分娩率、阴道助产率及剖宫产率分别为 90.0%(36/40)、5.0%(2/40)、5.0%(2/40)。观察组产妇自然分娩率显著高于对照组,剖宫产率显著低于对照组($P<0.05$);2 组产妇的阴道助产率比较差异无统计学意义($P>0.05$)。观察组产妇的第一产程和第二产程显著短于对照组($P<0.05$),2 组产妇的第三产程比较差异无统计学意义($P>0.05$);观察组产妇在镇痛后 5 min、60 min、宫口全开以及产后 24 h 时的 VAS 评分均显著低于对照组($P<0.05$);2 组新生儿产后 1 min 和 5 min 时的Apgar评分比较差异均无统计学意义($P>0.05$);对照组和观察组并发症总发生率分别为 42.50%(17/40)、20.00%(8/40),观察组并发症总发生率显著低于对照组($\chi^2=4.713$,$P<0.05$)。观察组产妇的纤维肌力和盆底肌闭合收缩力显著高于对照组,盆底肌静态张力显著低于对照组($P<0.05$)。**结论** 舒芬太尼联合罗哌卡因硬膜外麻醉能够提升初产妇的分娩镇痛效果,降低产妇剖宫产率,缩短产程,有利于产妇盆底功能的恢复,减少母婴并发症。

关键词: 硬膜外麻醉;初产妇;疼痛;盆底功能
中图分类号: R711.2 **文献标志码**: A **文章编号**: 1004-7239(2023)12-1146-05

Effects of different epidural anesthesia regimens on pain and postpartum pelvic floor function of primiparas

CAO Yajun, WU Wenchun, DONG Min, YAN Xia
(*Department of Anesthesiology, Xiangyang Hospital Affiliated to Hubei University of Chinese Medicine, Xiangyang* 441000, *Hubei Province, China*)

Abstract: **Objective** To observe the effects of different epidural anesthesia regimens on pain degree and postpartum pelvic floor function of primiparas. **Methods** A total of 80 primiparas who underwent painless epidural anesthesia delivery in Xiangyang Hospital Affiliated to Hubei University of Traditional Chinese Medicine from September 2021 to September 2022 were selected as the research subjects. The primiparas were divided into control group($n=40$) and observation group($n=40$) according to the anesthesia plan. The primiparas in the control group received epidural anesthesia with ropivacaine combined with physiological saline, while the primiparas in the observation group received epidural anesthesia with ropivacaine combined with sufentanil. The rate of natural delivery, rate of cesarean section, rate of vaginal delivery and the duration of each labor of primiparas were compared between the two groups; the analgesic effect of primiparas in the two groups was evaluated by pain visual analogue scale (VAS) at 5, 60 min after analgesia, full opening of the cervix and postpartum 24 hours; the asphyxia status of newborns in the two groups was evaluated by neonatal Apgar score at 1, 5 min after birth; the complications of nausea and vomiting, cervical or perineal injuries, urinary retention of puerperas and neonatal asphyxia were recorded and the total incidence of complications was compared between the two groups. At 6 – 8 weeks after delivery, pelvic floor functional indicators such as fiber muscle strength, pelvic floor muscle closure contraction force, and static tension of pelvic floor muscles of postpar-

DOI:10.7683/xxyxyxb.2023.12.009
收稿日期:2023 – 02 – 23
作者简介:曹雅军(1975 –),男,湖北钟祥人,学士,副主任医师,主要从事临床麻醉、疼痛诊疗工作。
通信作者:严 霞(1976 –),女,湖北枣阳人,学士,副主任药师,主要从事临床麻醉、疼痛诊疗工作;E-mail:xiangfanyx@163.com。

tum women in the two groups were measured by biological stimulus feedback instrument. **Results** The natural delivery rate, vaginal delivery rate and cesarean section rate of primiparas in the control group was 72.5% (29/40), 7.5% (3/40), 20.0% (8/40), respectively; the natural delivery rate, vaginal delivery rate and cesarean section rate of primiparas in the observation group was 90.0% (36/40), 5.0% (2/40) and 5.0% (2/40), respectively. The natural delivery rate of primiparas in the observation group was significantly higher than that in the control group, and the cesarean section rate was significantly lower than that in the control group ($P<0.05$); there was no significant difference in the vaginal delivery rate of primiparas between the two groups ($P>0.05$). The first and second stages of labor of primiparas in the observation group were significantly shorter than those in the control group ($P<0.05$), and there was no significant difference in the third stage of labor of primiparas between the two groups ($P>0.05$). The VAS score of primiparas in the observation group was significantly lower than that in the control group at 5, 60 min after analgesia, full opening of the cervix and postpartum 24 hours ($P<0.05$). There was no significant difference in the Apgar score of newborns between the two groups at 1, 5 min after birth ($P>0.05$). The total incidence of complications in the control group and the observation group was 42.50% (17/40) and 20.00% (8/40), respectively; the total incidence of complications in the observation group was significantly lower than that in the control group ($\chi^2=4.713$, $P<0.05$). The fiber muscle strength and pelvic floor muscle closure contraction force of postpartum women in the observation group were significantly higher than those in the control group, the static tension of pelvic floor muscles was significantly lower than that in the control group ($P<0.05$). **Conclusion** Sufentanil combined with ropivacaine epidural anesthesia can improve the analgesic effect of primiparas during childbirth, reduce the cesarean section rate, shorten the labor process, and facilitate the recovery of pelvic floor function in primiparas, reduce maternal and infant complications.

Key words: epidural anesthesia; primipara; pain; pelvic floor function

产妇分娩时由于子宫强烈收缩、周围组织受到牵拉以及盆底肌扩展等因素,会导致剧烈的分娩疼痛。虽然分娩疼痛属于分娩时的正常生理现象,但疼痛剧烈往往导致产妇出现恐惧、焦虑等负面情绪,分娩疼痛的程度仅次于烧伤痛[1-2]。既往有研究指出,随着分娩疼痛的增加,产妇的负面情绪可够刺激机体发生应激反应,不断分泌并释放儿茶酚胺等应激物质,刺激子宫收缩,增加胎儿宫内窘迫以及剖宫产的概率[3-5]。与经产妇相比,初产妇对分娩疼痛的耐受性更低,部分初产妇因对分娩疼痛的恐惧,直接选择剖宫产,从而对产后恢复和再次分娩均造成不利影响[6-8]。近年来,为了减轻产妇分娩时的疼痛,降低剖宫产率,产科联合麻醉科将硬膜外神经阻滞麻醉应用于产妇分娩过程,并获得了良好的分娩效果。基于此,本研究观察不同硬膜外麻醉方案对初产妇疼痛程度及母婴结局的影响,现将结果报道如下。

1　资料与方法

1.1　一般资料

选择 2021 年 9 月至 2022 年 9 月在湖北中医药大学附属襄阳医院进行硬膜外麻醉无痛分娩的 80 例产妇为研究对象。纳入标准:(1)产妇均为初产,且为足月单胎妊娠;(2)美国麻醉医师学会分级为Ⅰ、Ⅱ级;(3)骨盆外测量未见异常;(4)羊水量、胎儿体质量均满足自然分娩条件;(5)胎儿双顶径≤9.5 cm;(6)对研究所用药物无禁忌及过敏者;(7)患者或家属签署知情同意书。排除标准:(1)存在硬膜外麻醉禁忌证者;(2)存在剖宫产指征者;(3)合并高危妊娠并发症者;(4)合并严重心肝肾功能不全、凝血异常或血液系统疾病者;(5)存在头位难产或需手术助产者;(6)合并原发性宫缩乏力、胎儿窘迫等产妇;(7)存在精神障碍或无法配合者。在受试者自愿的基础上按照麻醉方案将产妇分为对照组和观察组,每组 40 例。对照组:产妇年龄 23 ~ 35 (27.79 ± 4.15) 岁,孕周 38 ~ 42 (39.89 ± 0.41) 周,新生儿体质量 3 278 ~ 3 869 (3 352.16 ± 48.12) g;观察组:产妇年龄 24 ~ 35 (28.21 ± 4.78) 岁,孕周 38 ~ 42 (40.03 ± 0.38) 周,新生儿体质量 3 312 ~ 3 910 (3 367.85 ± 50.34) g。2 组产妇及新生儿的基础资料比较差异无统计学意义 ($P>0.05$),具有可比性。本研究符合赫尔辛基宣言,且产妇签署知情同意书。本研究经医院伦理委员会审核批准。

1.2　麻醉方法

2 组产妇均于宫口开至 1 cm 时建立静脉通道补液,同时予以常规低流量吸氧。当宫口开至 3 cm 左右时,嘱产妇取左侧卧位,经第 2 ~ 3 节腰椎进行硬膜外穿刺,穿刺成功后硬脊膜外腔 3 ~ 4 cm 位置留管并固定,更换平卧位,予以质量浓度为 10 g · L^{-1} 的利多卡因(湖北天药药业股份有限公司,国药准字 H20133209)3 ~ 5 mL,并严密监测产妇的血压、脉搏以及血氧饱和度等生命体征。之后对照组患者于硬膜外注射 1 g · L^{-1} 罗哌卡因复合生理盐水 1.5 mL,观察组患者硬膜外注射 1 g · L^{-1} 的罗哌卡因复合 0.5 mg · L^{-1} 舒芬太尼(宜昌人福药业有限责任公司,国药准字 20054172)1.5 mL,观察 2 组产妇 5 min 内有无不良反应发生(如有不良反应则停止注射),然后连接自控硬膜外镇痛泵,锁定时

间为 15 ~ 30 min,期间根据疼痛程度调整药物浓度,待宫口全开时暂停给药。

1.3 观察指标

(1)产妇分娩方式:记录并比较 2 组产妇自然分娩率、剖宫产率以及阴道助产率;(2)2 组产妇的各个产程时间;(3)镇痛效果:分别于镇痛后 5 min、60 min 以及宫口全开和产后 24 h 时采用疼痛视觉模拟评分法(visual analogue scale,VAS)评估 2 组产妇的镇痛效果,总分为 0 ~ 10 分,得分越高表示疼痛程度越严重;(4)新生儿窒息情况:分别于出生后 1 min 和 5 min 采用新生儿 Apgar 评分评估 2 组新生儿窒息情况,评分越低表示新生儿的窒息情况越严重;(5)盆底功能:于分娩后 6 ~ 8 周采用生物刺激反馈仪对产妇进行盆底功能检查,包括纤维肌力、盆底肌闭合收缩力以及盆底肌静态张力;(6)并发症:记录并比较 2 组产妇恶心呕吐、宫颈及会阴损伤、尿潴留及新生儿窒息等并发症发生情况。

1.4 统计学处理

应用 SPSS 20.0 软件进行统计学分析。计量资料以均数 ± 标准差($\bar{x} \pm s$)表示,组间比较采用 t 检验;计数资料以例数和百分率表示,组间比较采用 χ^2 检验;$P < 0.05$ 为差异有统计学意义。

2 结果

2.1 2 组产妇分娩方式比较

对照组产妇中自然分娩 29 例(72.5%),阴道助产 3 例(7.5%),剖宫产 8 例(20.0%);观察组产妇自然分娩 36 例(90.0%),阴道助产 2 例(5.0%),剖宫产 2 例(5.0%)。观察组产妇自然分娩率显著高于对照组,剖宫产率显著低于对照组,差异有统计学意义($P < 0.05$);2 组产妇的阴道助产率比较差异无统计学意义($P > 0.05$)。

2.2 2 组产妇各产程比较

观察组产妇的第一产程和第二产程显著短于对照组,差异有统计学意义($P < 0.05$);2 组产妇的第三产程比较差异无统计学意义($P > 0.05$)。结果见表 1。

表 1 2 组产妇各产程时间比较

Tab. 1 Comparison of duration of different labor of primiparas between the two groups (min,$\bar{x} \pm s$)

组别	n	第一产程	第二产程	第三产程
对照组	40	445.10 ± 26.43	46.45 ± 4.79	8.85 ± 2.38
观察组	40	383.10 ± 23.16	44.30 ± 2.97	8.20 ± 2.04
t		11.157	2.409	1.311
P		0.000	0.018	0.194

2.3 2 组产妇镇痛效果比较

观察组产妇在镇痛后 5、60 min 以及宫口全开和产后 24 h 时的 VAS 评分均显著低于对照组,差异有统计学意义($P < 0.05$);结果见表 2。

表 2 2 组产妇镇痛效果比较

Tab. 2 Comparison of analgesic effects of primiparas between the two groups ($\bar{x} \pm s$)

组别	n	VAS 评分			
		镇痛后 5 min	镇痛后 60 min	宫口全开	产后 24 h
对照组	40	5.70 ± 1.57	3.70 ± 1.11	4.75 ± 1.66	3.80 ± 1.45
观察组	40	3.40 ± 1.33	1.15 ± 0.36	1.94 ± 0.74	2.25 ± 1.05
t		7.051	13.748	9.739	5.456
P		0.000	0.000	0.000	0.000

2.4 2 组新生儿 Apgar 评分比较

2 组新生儿产后 1 min 和 5 min 时的 Apgar 评分比较差异均无统计学意义($P > 0.05$),见表 3。

表 3 2 组新生儿 Apgar 评分比较

Tab. 3 Comparison of Apgar scores of neonates between the two groups ($\bar{x} \pm s$)

组别	n	Apgar 评分	
		1 min	5 min
对照组	40	9.16 ± 0.73	9.68 ± 0.55
观察组	40	9.26 ± 0.77	9.79 ± 0.40
t		−0.622	−0.963
P		0.536	0.338

2.5 2 组产妇及新生儿并发症比较

观察组产妇的恶心呕吐、宫颈或会阴损伤、尿潴留以及新生儿窒息等并发症总发生率显著低于对照组,差异有统计学意义($\chi^2 = 4.713$,$P < 0.05$);结果见表 4。

表 4 2 组产妇及新生儿并发症比较

Tab. 4 Comparison of complications of primiparas and newborns between the two groups 例(%)

组别	n	恶心呕吐	宫颈或会阴损伤	尿潴留	新生儿窒息	总发生
对照组	40	4(10.00)	8(20.00)	2(5.00)	3(7.50)	17(42.50)
观察组	40	2(5.00)	3(7.50)	2(5.00)	1(2.50)	8(20.00)
χ^2						4.713
P						0.030

2.6 2 组产妇盆底功能比较

观察组产妇的纤维肌力和盆底肌闭合收缩力显著高于对照组,盆底肌静态张力显著低于对照组,差异有统计学意义($P < 0.05$);结果见表 5。

表 5 2 组产妇盆底功能比较

Tab. 5 Comparison of pelvic floor function of primiparas between the two groups ($\bar{x} \pm s$)

组别	n	纤维肌力/级	盆底肌闭合收缩力/($g \cdot cm^{-3}$)	盆底肌静态张力/($g \cdot cm^{-3}$)
对照组	40	2.24 ± 0.43	226.47 ± 24.75	745.52 ± 42.81
观察组	40	2.89 ± 0.26	268.31 ± 22.78	712.20 ± 32.04
t		4.157	5.409	−4.311
P		0.009	0.000	0.000

3 讨论

虽然分娩疼痛属于正常生理现象,但作为一种不良应激,疼痛严重影响孕产妇乃至新生儿的身心健康,通常导致产妇产生焦虑、恐惧等不良情绪,进

而减少胎盘血流量,导致胎儿宫内窘迫或新生儿窒息等,使产妇剖宫产率和围生儿并发症的发生率升高,分娩风险增加,甚至导致产妇产后出现抑郁[9-12]。有研究表明,较多的初产妇在分娩过程中因剧烈疼痛刺激而产生应激反应,这是导致妊娠不良结局的主要因素[13-14]。分娩疼痛可使产妇出现负性心理和情绪,加之产妇对疼痛的错误认知和过度恐惧还会使初产妇抵触自然分娩方式,从而选择剖宫产分娩方式[15-16]。实施分娩镇痛可减轻产妇的身心负担,目前无痛分娩方式较多,主要有导乐无痛分娩、穴位镇痛、水中分娩以及椎管内镇痛等方法[17]。理想的无痛分娩方式应以母婴安全为前提,能够根据产妇对疼痛耐受的个体差异,确保镇痛药物的补充方便和及时,从而在整个产程维持良好的镇痛效果[18]。此外,无痛分娩方法应确保对产妇的运动功能不产生影响,使产妇能够保持清醒并主动参与到分娩过程中,并能在紧急情况下转为剖宫产[19-20]。非药物镇痛缓解分娩疼痛的程度有限,仍需高质量研究加以论证。药物镇痛方法中的硬膜外麻醉无痛分娩方案临床应用广泛,成为初产妇分娩的主要方式,该方法是在产妇腰椎特定部位注射麻醉药物进行感觉阻滞,能精准控制麻醉药物剂量,维持安全有效且长效的镇痛效果[21-23]。

产妇及家属对分娩方式和镇痛技术的要求逐渐提高,主要是在确保产妇和新生儿安全的前提下减轻分娩的疼痛。这也是产科不断寻求的安全有效的分娩方式,促使分娩镇痛技术的优化成为临床研究的热点。目前产科较为常用的是硬膜外麻醉,属于椎管内麻醉,具有起效快、镇痛效果可靠且药量可控等优势,能够有效消除产妇负性情绪,使产妇放松心情。本研究选择罗哌卡因、舒芬太尼作为初产妇分娩的镇痛药物,其中罗哌卡因具有感觉运动神经阻滞分离的效果,心脏毒性相对较小,蛋白结合率良好,小剂量即可发挥镇痛效果,不易透过胎盘屏障,因此不影响胎儿健康和产妇腹肌及子宫的收缩,能有效缓解产妇分娩后行走困难,是较为理想的分娩镇痛药物[24-25]。舒芬太尼属于麻醉性镇痛药物,镇痛效果较好,并且起效快,因其半衰期较短,所以在体内蓄积的危险性低,已被广泛应用于产科分娩麻醉[26-27]。舒芬太尼与罗哌卡因结合用于初产妇分娩镇痛可以降低麻醉药物的用量和浓度,减少运动阻滞,提高镇痛效果。有研究表明,舒芬太尼联合罗哌卡因硬膜外麻醉用于产妇镇痛分娩具有良好的可控性,且对中枢神经系统无抑制作用,对产妇的血流动力学也无严重影响[28-29]。本研究中,观察组产妇自然分娩率显著高于对照组,剖宫产率显著低于对照组,2 组产妇的阴道助产率比较差异无统计学意义;观察组产妇的第一产程和第二产程显著短于对照组,2 组产妇的第三产程比较差异无统计学意义;观察组产妇在镇痛后 5、60 min 以及宫口全开和产后 24 h 时的 VAS 评分均显著低于对照组;观察组新生儿产后 1 min 和 5 min 时的 Apgar 评分比较差异均无统计学意义;观察组产妇的恶心呕吐、宫颈或会阴损伤、尿潴留以及新生儿窒息等并发症总发生率显著低于对照组。说明,舒芬太尼联合罗哌卡因能够有效提升初产妇分娩镇痛效果,并可以降低产妇的剖宫产率,缩短产程,减少母婴并发症。另外,观察组产妇的纤维肌力和盆底肌闭合收缩力显著高于对照组,而盆底肌静态张力则显著低于对照组,提示舒芬太尼联合罗哌卡因用于初产妇镇痛有利于产后盆底肌功能的恢复。

4　结论

舒芬太尼复合罗哌卡因硬膜外麻醉能够提高初产妇分娩镇痛的效果,降低产妇的剖宫产率,缩短产程,有利于盆底功能恢复,并减少母婴并发症发生率,安全性较高,适宜临床推广。

参考文献:

[1] TAN H S,REED S E,MEHDIRATTA J E,*et al*. Quality of labor analgesia with dural puncture epidural versus standard epidural technique in obese parturients: a double-blind randomized controlled study[J]. *Anesthesiology*,2022,136(5):678-687.

[2] 银海英,万里,黄瀚. 去甲肾上腺素预防双胎产妇腰硬联合麻醉后低血压有效剂量的研究[J]. 四川大学学报(医学版),2022,53(5):880-889.
YIN H Y,WAN L,HUANG H. Effective dose of prophylactic norepinephrine for preventing hypotension under combined spinal and epidural anesthesia during cesarean section in singleton versus twin pregnancies[J]. *J Sichuan Univ (Med Sci)*,2022,53(5):880-889.

[3] CHAO W H,CHENG W S,HU L M,*et al*. Risk factors for epidural anesthesia blockade failure in cesarean section: a retrospective study[J]. *BMC Anesthesiol*,2023,23(1):338.

[4] BI Y,ZHOU J. Spinal subdural hematoma and subdural anesthesia following combined spinal-epidural anesthesia: a case report[J]. *BMC Anesthesiol*,2021,21(1):130.

[5] 黄伟伟,张加强,刘莉影,等. 不同剂量罗哌卡因腰-硬联合麻醉对剖宫产产妇术后 VAS 评分和血流动力学水平的影响[J]. 中国妇幼保健,2022,37(17):3279-3282.
HUANG W W,ZHANG J Q,LIU L Y,*et al*. Effects of different doses of ropivacaine on postoperative VAS score and hemody-namic level during cesarean section in pregnant women[J]. *Matern Child Health Care China*,2022,37(17):3279-3282.

[6] CZECH I,FUCHS P,FUCHS A,*et al*. Pharmacological and non-pharmacological methods of labour pain relief-establishment of effectiveness and comparison[J]. *Int J Environ Res Public Health*,2018,15(12):2792.

[7] 冯春华,乔善海. 连续硬膜外麻醉对分娩镇痛产妇产程及母婴结局的影响[J]. 中国实用医药,2022,17(19):83-85.
FENG C H,QIAO S H. Effect of continuous epidural anesthesia on

labor process and maternal and infant outcomes in maternal women undergoing labor analgesia[J]. *China Prac Med*, 2022, 17(19): 83-85.

[8] 高立娟,刘巧香. 椎管内阻滞麻醉应用时机对初产妇产程及母婴结局的影响[J]. 临床医学工程,2022,29(8):1109-1110.
GAO L J, LIU Q X. Impact of application timing of intraspinal block anesthesia on labor process and maternal-infant outcomes of primiparae [J]. *Clin Med Eng*, 2022, 29(8): 1109-1110.

[9] WANG Y, CHEN Z, DANG X, *et al*. Different doses of ropivacaine either with sufentanil or with dexmedetomidine for labor epidural anesthesia regarding painless childbirth: a retrospective, multicenter study[J]. *Pharmacology*, 2022, 107(7/8): 386-397.

[10] 马漪洁,王秀环,张玉,等. 硬膜外规律间断给药方案对自然分娩初产妇的麻醉效果[J]. 临床医学工程,2022,29(7):955-956.
MA Y J, WANG X H, ZHANG Y, *et al*. Anesthetic effect of regular intermittent epidural administration on primiparas with natural delivery[J]. *Clin Med Eng*, 2022, 29(7): 955-956.

[11] LEE L O, RAMIREZ-CHAPMAN A L, WHITE D L, *et al*. Postcesarean analgesia with epidural morphine after epidural 2-chloroprocaine: a randomized noninferiority trial [J]. *Anesth Analg*, 2023, 136(1): 86-93.

[12] LI J, CHEN A E, YE R. Comparison of three neuraxial anesthesia approaches in parturient women with obesity and pregnancy-induced hypertension who underwent cesarean section [J]. *J Int Med Res*, 2021, 49(12): 3000605211066433.

[13] 赵静,吴高平. 蛛网膜下腔联合硬膜外阻滞麻醉对剖宫产产妇麻醉用药剂量和凝血指标的影响[J]. 血栓与止血学,2022,28(3):1017-1018,1021.
ZHAO J, WU G P. The effects of subarachnoid combined with epidural anesthesia on anesthetic dosage and coagulation indexes of cesarean section women[J]. *Chin J Thromb Haemost*, 2022, 28(3): 1017-1018, 1021.

[14] 王绮雯,李如玉,谢美连. 腰硬联合麻醉剖宫产围术期同理心干预护理对产妇负性情绪的改善价值[J]. 基层医学论坛,2022,26(17):82-84.
WANG Y W, LI R Y, XIE M L. Value of empathy intervention nursing during perioperative period of cesarean section with combined lumbar and epidural anesthesia on improving maternal negative emotions[J]. *Primary Med Forum*, 2022, 26(17): 82-84.

[15] KAPOOR A, HALLING J. Epidural anesthesia for cesarean section for parturient with recently diagnosed asymptomatic chiari malformation type I: a case report[J]. *HCA Healthc J Med*, 2021, 2(6): 407-410.

[16] 周红娟,冯传涛. 罗哌卡因复合右美托咪定硬膜外麻醉对剖宫产产妇应激反应及新生儿 Apgar 评分的影响研究[J]. 贵州医药,2022,46(5):726-728.
ZHOU H J, FENG C T. Effect of Ropivacaine combined with dexmedetomidine on stress response and Apgar score of neonates during cesarean section[J]. *Guizhou Med J*, 2022, 46(5): 726-728.

[17] CAO X, YANG W, MEI W. Real-time ultrasound-guided epidural anesthesia for cesarean section in a parturient with achondroplasia [J]. *J Int Med Res*, 2021, 49(6): 3000605211023701.

[18] 刘丹丹. 舒芬太尼结合盐酸罗哌卡因硬膜外麻醉在高龄产妇无痛分娩中的应用效果及对胎儿与剖宫产率的影响[J]. 临床合理用药杂志,2022,15(14):147-150.
LIU D D. Effect of Sufentanil combined with Ropivacaine hydrochloride epidural anesthesia in painless delivery of elderly women and its influence on fetal and cesarean section rates[J]. *Chin J Clin Ration Drug Use*, 2022, 15(14): 147-150.

[19] TONG S, RAO C, MIN S, *et al*. Obstetric anesthesia clinic childbirth course combined with labor epidural analgesia is associated with a decreased risk of postpartum depression: a prospective cohort study[J]. *BMC Anesthesiol*, 2022, 22(1): 389.

[20] THAKUR D, MODAK S, RAYADURG V, *et al*. Combined general and epidural anesthesia for emergency cesarean delivery of twins in a parturient with coarctation of aorta[J]. *AANA J*, 2019, 87(6): 437-440.

[21] 杨楠. 罗哌卡因复合舒芬太尼硬膜外麻醉对初产经阴道无痛分娩产妇产程和母婴结局的影响[J]. 数理医药学杂志,2022,35(4):582-584.
YANG N. Effects of epidural anesthesia of ropivacaine combined with sufentanil on stages of labor and maternal-infant outcomes of primiparas with transvaginal painless delivery[J]. *J Math Med*, 2022, 35(4): 582-584.

[22] FERNANDES A L, MENDONÇA M, COSTA D, *et al*. Anaesthesia in a parturient with systemic mastocytosis[J]. *Rev Esp Anestesiol Reanim (Engl Ed)*, 2022, 69(6): 368-371.

[23] MORENO-DUARTE I, HALL R R 3RD, SHUTRAN M S, *et al*. Epidural anesthesia for cesarean delivery in a parturient with lumboperitoneal shunt: a case report[J]. *A A Pract*, 2019, 12(11): 436-437.

[24] 李芳坤,朱建坡,任学军,等. 不同浓度罗哌卡因腰硬联合麻醉对妊娠期糖尿病产妇剖宫产术后疼痛和微循环的影响[J]. 中国计划生育学杂志,2022,30(6):1264-1268.
LI F K, ZHU J P, REN X J, *et al*. Effects of the combined spinalepidural anesthesia with different concentrations of ropivacaine used in cesarean section of pregnant women with gestational diabetes mellitus on their postoperative pain and micro-circulation [J]. *Chin J Fam Plan*, 2022, 30(6): 1264-1268.

[25] SHARPE E E, MOLITOR R J, ARENDT K W, *et al*. Intrathecal morphine versus intrathecal hydromorphone for analgesia after cesarean delivery: a randomized clinical trial[J]. *Anesthesiology*, 2020, 132(6): 1382-1391.

[26] ZHOU Y, CHEN W, ZHOU S, *et al*. Comparison of different approaches to combined spinal epidural anesthesia (CSEA) under the guidance of ultrasound in cesarean delivery of obese patients: a randomized controlled trial[J]. *Eur J Med Res*, 2021, 26(1): 106.

[27] FENG G, WANG Y, FENG J, *et al*. The relationship between core temperature and perioperative shivering during caesarean section under intrathecal anesthesia with bupivacaine and ropivacaine: a randomized controlled study[J]. *J Anesth*, 2021, 35(6): 889-895.

[28] CHEN Y, LIU W, GONG X, *et al*. Comparison of effects of general anesthesia and combined spinal/epidural anesthesia for cesarean delivery on umbilical cord blood gas values: a double-blind, randomized, controlled study[J]. *Med Sci Monit*, 2019, 25: 5272-5279.

[29] 胡琼花,卫毅. 罗哌卡因联合舒芬太尼硬膜外麻醉对无痛分娩产妇母婴结局及应激反应的影响[J]. 中国医学创新,2022,19(22):84-88.
HU Q H, WEI Y. Effects of ropivacaine combined with sufentanil epidural anesthesia on maternal and infant outcomes and maternal stress response during painless delivery parturients [J]. *Med Innov J China*, 2022, 19(22): 84-88.

(本文编辑:孟 月)