

doi: 10.13241/j.cnki.pmb.2022.04.017

无痛分娩产妇生产期间导致产妇出现发热的影响因素与预防措施*

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摘要 目的:探讨无痛分娩产妇生产期间导致产妇出现发热的影响因素与预防措施。**方法:**选取我院 2020 年 1 月到 2020 年 12 月共收治的 60 例无痛分娩生产期间发热的产妇作为研究对象,将其分为观察组,另取同期 60 例无痛分娩生产期间未发生发热的产妇作为对照组。对所有产妇进行临床资料分析,对比两组产妇的人口学特征、妊娠基础疾病情况以及产时不同情况,并对所有相关因素进行多因素 logistic 回归分析。最后进行总结分析,并提出无痛分娩产妇生产期间发热的预防措施。**结果:**两组产妇的年龄、孕周、孕次、死胎史对比无明显差异($P>0.05$),观察组产妇有保胎史的例数明显高于对照组,观察组产次明显低于对照组($P<0.05$);两组产妇妊娠期贫血、妊娠期甲状腺功能异常、妊娠期高血压、妊娠期糖尿病、早产情况对比无明显差异($P>0.05$),观察组胎膜早破产妇人数明显高于对照组($P<0.05$);观察组产妇的第一产程时间、第二产程时间以及胎膜早破距离分娩时间明显高于对照组($P<0.05$),观察组产妇的常规剂量罗哌卡因麻醉使用、人工破膜、宫缩素使用以及羊水污染人数明显高于对照组($P<0.05$);对所有因素进行赋值,其中"是"或"有"为 1,"否"或"无"为 0,其他因素依照数值变量赋值。通过 logistic 回归分析发现,只有保胎史、产次、第一产程时间、第二产程时间、胎膜早破据分娩时间、硬膜外麻醉药物、宫缩素使用以及羊水污染为无痛分娩生产期间产妇发热的独立危险因素($P<0.05$)。**结论:**无痛分娩产妇的胎膜早破情况、破膜方式可能与产妇出现发热的情况具有一定相关性,但是只有保胎史、产次、第一产程时间、第二产程时间、胎膜早破据分娩时间、硬膜外麻醉药物、宫缩素使用以及羊水污染是产妇出现发热情况的独立危险因素,因此临床上要对初产妇、有保胎史、产程时间长、胎膜早破据分娩时间长、羊水污染等无痛分娩产妇给予一定预防措施,并调整硬膜外麻醉药物的使用,减少宫缩素使用,来避免无痛分娩产妇在生产期间出现的发热现象。

关键词:无痛分娩;产妇;产间发热;预防措施;影响因素

中图分类号:R714.3 文献标识码:A 文章编号:1673-6273(2022)04-678-06

Influencing Factors and Preventive Measures of Fever during Painless Delivery*

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ABSTRACT Objective: To explore the influencing factors and preventive measures of fever during painless delivery. **Methods:** 60 cases of parturients with fever during painless childbirth in our hospital from January 2020 to December 2020 were selected as the research objects, and they were divided into the observation group, and another 60 cases of parturients without fever during painless childbirth in the same period were selected as the control group. Clinical data analysis was carried out for all the puerpera. The demographic characteristics, basic diseases of pregnancy and different conditions during labor of the two groups were compared, and all the related factors were analyzed by multivariate logistic regression. Finally, summarize and analyze, and put forward the prevention measures of painless childbirth maternal fever during production. **Results:** There was no significant difference in age, gestational weeks,

* 基金项目:中国医学科学院中央级公益性科研院所基本科研业务费专项资金资助项目(2019PT310002);

安徽省转化医学研究院科研基金项目(2019PT310002);安徽省重点研究和开发计划项目(201904a07020046)

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(收稿日期:2021-04-28 接受日期:2021-05-23)

times of pregnancy and stillbirth history between the two groups ($P>0.05$). The number of cases with history of fetal protection in the observation group was significantly higher than that in the control group, and the times of labor in the observation group was significantly lower than that in the control group ($P<0.05$). There was no significant difference in anemia, thyroid gland dysfunction, hypertension, diabetes mellitus and premature delivery between the two groups ($P>0.05$), the number of pregnant women with premature rupture of membranes in the observation group was significantly higher than that in the control group ($P<0.05$); the time of the first stage of labor, the second stage of labor and the delivery time of premature rupture of membranes in the observation group were significantly higher than those in the control group ($P<0.05$); the number of pregnant women in the observation group with routine dose of ropivacaine anesthesia, artificial rupture of membranes, use of oxytocin and amniotic fluid pollution were significantly higher than those in the control group. All factors were assigned values, in which "yes" was 1, and "no" was 0. Logistic regression analysis showed that only the history of fetal protection, times of labor, time of the first stage of labor, time of the second stage of labor, delivery time of premature rupture of membranes, epidural anesthetics, use of oxytocin and amniotic fluid pollution were the independent risk factors of maternal fever during painless delivery ($P<0.05$). **Conclusion:** The situation of premature rupture of membranes and the way of rupture of membranes may be related to the occurrence of fever, but only the history of fetal protection, the number of labor, the time of the first stage of labor, the time of the second stage of labor, the delivery time of premature rupture of membranes, epidural anesthetics, the use of oxytocin and amniotic fluid pollution are the independent risk factors of fever on the primipara, have a history of fetal protection, long duration of labor, premature rupture of membranes, long delivery time, amniotic fluid pollution and other painless childbirth maternal give certain preventive measures, and adjust the use of epidural anesthesia, reduce the use of oxytocin, to avoid painless childbirth maternal fever during production.

Key words: Painless childbirth; Puerpera; Intrapartum fever; Preventive measures; Influencing factors

Chinese Library Classification(CLC): R714.3 **Document code:** A

Article ID:1673-6273(2022)04-678-06

前言

无痛分娩即通过麻醉方式(经皮电神经刺激、吸入笑气、区域麻醉等镇痛方式)减轻产妇分娩时疼痛程度的方法,又称为分娩镇痛。因受子宫收缩、产道牵拉或损伤、负面情绪等多种因素影响,产妇自然分娩时会出现剧烈疼痛,大大增加了分娩痛苦^[1,2]。所以围生期中有效的麻醉方法,能够促进产妇平稳度过围生期,并减少分娩带来的痛苦,提升分娩体验。相关研究表明^[3],应用无痛分娩能够减轻自然分娩中产生的疼痛感,从而减弱产妇的心理和生理应激反应,加速宫口扩张,缩短产程,从而让胎儿顺利分娩,减少剖宫产率。产时发热是临床上无痛分娩产妇的常见疾病,是指产妇在生产过程中体温 ≥ 37.5 度,发生率为1.6%到14.6%^[4]。产妇一旦在生产过程中出现发热现象,特别是高热情况,将会增加剖宫产、阴道助产、难产以及产后出血的发生率,也可能会导致胎死宫内、新生儿败血症、胎儿宫内感染以及胎儿窘迫等严重不良结局,因此预防无痛分娩产妇产时发热具有重要价值。产时发热主要分为感染性发热和非感染性发热,国外相关研究发现^[5,6],产时发热主要与甲状腺功能亢进、硬膜外麻醉镇痛以及前列腺素制剂的使用有关。但是国内并没有对产时发热系统性报道的文章^[7]。因此,本文选取我院2020年1月到2020年12月共收治的60例无痛分娩生产期间发热的产妇作为研究对象,探讨无痛分娩产妇产时发热的影响因素与预防措施,具体报告如下。

1 资料与方法

1.1 一般资料

选取我院2020年1月到2020年12月共收治的60例无痛分娩生产期间发热的产妇作为研究对象,将其分为观察组,

另取同期60例无痛分娩生产期间未发生发热的产妇作为对照组。入选标准:所有产妇对本研究知情并签署同意书;所有产妇均为选择无痛分娩的足月妊娠者;观察组产妇产时体温 $\geq 37.5^{\circ}\text{C}$ ^[8];本研究经我院伦理委员会批准同意。排除标准:有麻醉禁忌者;不配合研究者;合并感染导致发热者;多胎妊娠者。

1.2 方法

通过临床资料收集产妇的相关资料,其中包含年龄、产次、孕次、孕周、死胎史、保胎史等人口学特征资料;妊娠期贫血、妊娠期甲状腺功能异常、妊娠期高血压、妊娠期糖尿病、早产以及胎膜早破等基础疾病情况;第一产程时间、第二产程时间以及胎膜早破距离分娩时间、硬膜外麻醉药物、破膜方式、羊水污染以及缩宫素使用情况等产时因素。

1.3 统计学方法

本研究数据采取统计学软件SPSS 23.0进行数据分析,计数资料以例数/百分比($n/\%$)表示,进行 χ^2 检验;计量资料以符合正态分布则用均数 $\pm$ 标准差($\bar{x}\pm s$)表示,组间比较采用t检验;采用logistic回归分析分析无痛分娩产妇产时发热的影响因素;以 $P<0.05$ 为差异有统计学意义。

2 结果

2.1 两组产妇人口学特征对比分析

两组产妇的年龄、孕周、孕次、死胎史对比无明显差异($P>0.05$),观察组产妇有保胎史的例数明显高于对照组,观察组产次明显低于对照组($P<0.05$),如表1所示。

2.2 两组产妇妊娠基础疾病情况对比分析

两组产妇妊娠期贫血、妊娠期甲状腺功能异常、妊娠期高血压、妊娠期糖尿病、早产情况对比无明显差异($P>0.05$),观察组胎膜早破产妇人数明显高于对照组($P<0.05$),如表2所示。

表 1 两组产妇人口学特征对比分析

Table 1 Comparative analysis of the demographic characteristics of the two groups

Classification	Observation group (n=60)	Control group(n=60)
Age (years)	29.31±3.68	28.27±5.39
Birth (times)	1.12±0.26*	1.47±0.32
Pregnancy (times)	2.23±0.43	2.25±0.46
Week of pregnancy (weeks)	39.33±1.53	39.46±1.73
History of stillbirth (n)		
Yes	4	3
No	56	57
History of fetal preservation (n)		
Yes	17*	4
No	43	56

Note: *Compared with control group, $P<0.05$.

表 2 两组产妇妊娠基础疾病情况对比分析(例,%)

Table 2 Comparative analysis of basic pregnancy diseases between the two groups (n, %)

Classification	Observation group (n=60)	Control group(n=60)
Anemia in pregnancy		
Yes	15	13
No	45	47
Abnormal thyroid function during pregnancy		
Yes	8	6
No	52	54
Gestational hypertension		
Yes	5	3
No	55	57
Gestational diabetes mellitus		
Yes	6	7
No	54	53
Premature rupture of fetal membranes		
Yes	37*	18
No	23	42
Premature birth		
Yes	4	6
No	56	54

Note: *Compared with control group, $P<0.05$.

2.3 两组产妇产时不同情况对比分析

观察组产妇的第一产程时间、第二产程时间以及胎膜早破距离分娩时间明显高于对照组($P<0.05$),观察组产妇的常规剂量罗哌卡因麻醉使用、人工破膜、宫缩素使用以及羊水污染人数明显高于对照组($P<0.05$),如表 3 所示。

2.4 多因素 logistic 回归分析

对所有因素进行赋值,其中"是"或"有"为 1,"否"或"无"为 0,其他因素依照数值变量赋值。通过 logistic 回归分析

发现,只有保胎史、产次、第一产程时间、第二产程时间、胎膜早破据分娩时间、硬膜外麻醉药物、宫缩素使用以及羊水污染为无痛分娩生产期间产妇发热的独立危险因素($P<0.05$),如表 4 所示。

3 讨论

产妇因分娩宫缩阵痛明显而导致产生强烈的焦虑情绪或发生产前抑郁,导致产妇的自然分娩信心受影响,并引发宫缩

表 3 两组产妇产时不同情况对比分析

Table 3 Comparative analysis of different conditions of the two groups of women during delivery

Classification	Observation group (n=60)	Control group(n=60)
Time of first birth (min)	526.45±214.54*	389.55±192.56
Time of first birth (min)	36.53±13.56*	31.65±12.13
Duration of premature rupture of membranes (min)	687.52±614.53*	465.12±567.31
Epidural anesthetics (n)		
Low dose ropivacaine sufentanil	14*	38
Conventional dose of ropivacaine	46	22
Membrane breaking (n)		
Autoclasia	21*	11
Artificial rupture	39	49
Use of oxytocin (n)		
Yes	38*	10
No	22	50
Amniotic fluid contamination (n)		
Yes	21*	9
No	39	51

Note: *Compared with control group, $P<0.05$.

表 4 多因素 logistic 回归分析

Table 4 Multivariate logistic regression analysis

Factor	PE	SE	Wald	P	OR	95% CI
Abortion history	0.431	0.034	5.314	0.008	1.431	0.754~2.435
History of fetal preservation	0.463	0.096	8.096	0.023	2.546	1.364~3.475
Time of first birth	0.457	0.089	8.145	0.030	2.458	1.359~3.257
Time of first birth	0.546	0.035	4.541	0.013	2.546	1.461~3.732
Early rupture of membranes	0.335	0.108	10.484	0.008	0.464	0.210~1.347
Epidural anesthesia	0.464	0.105	8.484	0.016	2.774	1.876~4.010
Use of oxytocin	0.447	0.304	6.274	0.024	0.747	0.314~1.249
Amniotic fluid contamination	0.543	0.143	3.547	0.021	1.547	0.583~2.542

乏力等不良状况而延长其产程时间,增加产妇疼痛感,最终引发不良妊娠结局^[9,10]。随着临床医疗技术水平的不断成熟,减轻孕妇生产过程中的疼痛引起了社会的广泛关注。其中自然分娩虽然对产妇的机体安全性比较高,但是出于疼痛影响,大多数产妇更加倾向于用剖宫产这种分娩方式。而由于剖宫产属于一种创伤性手术,产妇术后恢复慢^[11-13]。因此越来越多的产妇选择无痛分娩。但是无痛分娩过程中产妇由于受到不同因素影响,可出现产间发热现象,为了避免产间发热现象,本文对导致发热的影响因素进行分析。

本研究结果表明,两组产妇的年龄、孕周、孕次、死胎史对比无明显差异,观察组产妇有保胎史的例数明显高于对照组,观察组产次明显低于对照组,Malin G^[14]和 Simonet T^[15]的研究

与本研究有一定的不同,结果显示保胎情况与无痛分娩产间发热并无明显关系,但是本研究中发现,保胎情况可能会导致产间发热现象,因保胎过程中,部分孕妇宫颈缩短,宫口开大,羊膜囊暴露于阴道环境,增加了感染的可能性。Asl^[16]和 Yu WQ^[17]等学者的研究与本研究类似,发现初产妇的产间发热发生率高于二次生产的产妇。这是因为,初产妇大多产程时间比较长,而且阴道检查等人工干预增多,会导致阴道和宫颈管出现内源性细菌上行现象,增加感染机会。两组产妇妊娠期贫血、妊娠期甲状腺功能异常、妊娠期高血压、妊娠期糖尿病、早产情况对比无明显差异,观察组胎膜早破产妇人数明显高于对照组,陈文殊^[18]的研究与本研究类似,研究产间发热对不同产妇临床结局的影响,结果显示发生产间发热的产妇胎儿窘迫,羊水重度污

染和宫内感染的发生率明显高于未发生产间发热的产妇,胎膜早破发生率明显高于未发生产间发热的产妇。国外相关研究显示^[19,20],胎膜早破是产时发热的独立因素,但是本研究中发现胎膜早破虽然与无痛分娩产妇产间发热具有一定相关性,但是并不属于产间发热的独立危险因素,与相关研究具有一定差异;观察组产妇的第一产程时间、第二产程时间以及胎膜早破距离分娩时间明显高于对照组,观察组产妇的常规剂量罗哌卡因麻醉使用、人工破膜、宫缩素使用以及羊水污染人数明显高于对照组。有研究显示^[21-23],产妇出现产间发热和椎管内分娩镇痛具有一定关系。因此多数学者认为,改变麻药浓度和给药方式,能够降低产妇产间发热的问题,本研究中也看出常规剂量罗哌卡因麻醉使用出现发热的产妇比较多,这是因为局部麻药和脊神经结合之后,会同步对机体的冷热觉产生组织,导致机体出现温度调节中枢紊乱现象,从而产妇的体温增加^[24-26]。人工破膜、胎膜早破时间长以及羊水污染都会增加宫腔感染的机会,从而导致发热现象。还有研究发现缩宫素因可增加前列腺素 E₂ 和炎性介质 F(α) 的分泌,这可能也是缩宫素导致产妇产间发热的重要原因^[27,28];对所有因素进行赋值,其中"是"或"有"为1,"否"或"无"为0,其他因素依照数值变量赋值。通过 logistic 回归分析发现,只有保胎史、产次、第一产程时间、第二产程时间、胎膜早破到分娩时间、硬膜外麻醉药物、宫缩素使用以及羊水污染为无痛分娩生产期间产妇产间发热的独立危险因素,与雷黎明^[29]的研究类似,探讨硬膜外分娩镇痛期间产间发热的影响因素,选择分娩镇痛期间产间发热产妇为研究组,同期体温正常产妇为对照组,记录两组产妇的年龄,BMI,产程,分娩镇痛时间,胎膜早破到分娩结束时间,阴道检查次数,是否使用缩宫素,羊水污染例数,出血量,胎儿体重,脐动脉 pH 值等,二项式 Logistic 回归法对影响产间发热的相关因素进行分析结果显示高 BMI,分娩镇痛时间较长,胎膜早破到分娩结束时间较长,多次阴道检查与产间发热有关,同时在国内多数研究中^[30,31],多发现无痛分娩产妇产间发热为硬膜外麻醉和胎膜早破导致,但是本研究中,发现了更多的危险因素,希望能为日后产妇产间发热的预防提供参考。

综上所述,无痛分娩产妇的胎膜早破情况、破膜方式可能与产妇出现发热的情况具有一定相关性,但是只有保胎史、产次、第一产程时间、第二产程时间、胎膜早破到分娩时间、硬膜外麻醉药物、宫缩素使用以及羊水污染是产妇出现发热情况的独立危险因素。因此本文针对于无痛分娩产妇预防发热现象的出现提出以下预防措施:(1)对无痛分娩产妇,尽量应用联合麻醉药物,在确保产妇麻醉效果的情况下,尽可能减少罗哌卡因的浓度,并密切监测产妇的生命体征,严格控制产妇的给药间隔和给药剂量,如果必要情况下,推荐对产妇应用超声引导下麻醉,更加精确麻醉药物的使用剂量。(2)对所有产妇进行相关检查过程中,要正确掌握阴道操作指征,严格执行无菌操作,预防由于感染所导致的产时发热现象,并加强胎膜早破产妇的产程管理。(3)产妇在分娩过程中尽量让产妇保持自由体位,因为自由体位能够减少产热量,增加散热量,而且自由体位分娩还能够协调自身分娩决定因素,包括胎儿、产道、产力以及心理等,并且自由体位分娩能够减少产程中缩宫素的使用、人工破

膜以及阴道检查,降低感染发热现象。

参考文献 (References)

- [1] Gong CA, Lee HC, Chang Y, et al. Double assurance of epidural space detection using fiberoptics-based needle design and autofluorescence technologies for epidural blockade in painless labor [J]. *Sensors (Basel)*, 2018, 18(11): 3592-3593
- [2] Ali HM, Wahdan A. Using dexamethasone as an adjuvant to levobupivacaine in epidural anesthesia to change the pain intensity and duration in painless labor[J]. *Saudi J Anaesth*, 2018, 12(2): 209-214
- [3] Logsdon K, Smith-Morris C. An ethnography on perceptions of pain in Dutch "Natural" childbirth[J]. *Midwifery*, 2017, 55: 67-74
- [4] Melese Siyoum, Shewangizaw Mekonnen. Labor pain control and associated factors among women who gave birth at Leku primary hospital, southern Ethiopia[J]. *BMC Res Notes*, 2019, 12(1): 1-5
- [5] Saeedeh Mohamad Beigi, Mahboubeh Valiani, Mousa Alavi, et al. The relationship between attitude toward labor pain and length of the first, second, and third stages in primigravida women [J]. *J Educ Health Promot*, 2019, 8(1): e130
- [6] Wang YS, Xu MJ. Comparison of ropivacaine combined with sufentanil for epidural anesthesia and spinal-epidural anesthesia in labor analgesia[J]. *BMC Anesthesiol*, 2020, 20(1): 1-9
- [7] Vayssiere C, Beucher G, Dupuis O, et al. Instrumental delivery: clinical practice guidelines from the French College of Gynaecologists and Obstetricians[J]. *Eur J Obstet Gynecol Reprod Biol*, 2011, 159(1): 43-48
- [8] Ni JP, Qin Y, Kang L, et al. Combined spinal-epidural anesthesia with sufentanil and ropivacaine for labor pain in women with pregnancy-induced hypertension[J]. *Int J Clin Exp Med*, 2019, 12(12): 13902-13907
- [9] Azizi R, Ahmadi M, Danaii S, et al. Cyclosporine A Improves Pregnancy Outcomes in Women With Recurrent Pregnancy Loss and Elevated Th1/Th2 Ratio [J]. *J Cell Physiol*, 2019, 234 (10): 19039-19047
- [10] Ahmadi M, Abdolmohammadi-Vahid S, Ghaebi M, et al. Effect of Intravenous Immunoglobulin on Th1 and Th2 Lymphocytes and Improvement of Pregnancy Outcome in Recurrent Pregnancy Loss (RPL)[J]. *Biomed Pharmacother*, 2017, 92: 1095-1102
- [11] Henrique AJ, Gabrielloni MC, Rodney P, et al. Non-pharmacological Interventions During Childbirth for Pain Relief, Anxiety, and Neuroendocrine Stress Parameters: A Randomized Controlled Trial [J]. *Int J Nurs Pract*, 2018, 24(3): e12642
- [12] Gong P, Shi B, Wang J, et al. Association between Th1/Th2 immune imbalance and obesity in women with or without polycystic ovary syndrome[J]. *Gynecol Endocrinol*, 2018, 34(8): 709-714
- [13] Veleminsky M, Ambroz A, Rossner P, et al. Oxidative Stress in Newborns by Different Modes of Delivery[J]. *Neuro Endocrinol Lett*, 2016, 37(6): 445-451
- [14] Malin G, Bugg G, Thornton J, et al. Does oral carbohydrate supplementation improve labour outcome? A systematic review and individual patient data meta-analysis [J]. *BJOG: An International Journal of Obstetrics & Gynaecology*, 2016, 123(4): 510-517
- [15] Simonet T, Gakuba C, Desmeulles I, et al. Effect of oral carbohydrate

- intake during labor on the rate of instrumental vaginal delivery: a multicenter, randomized controlled trial [J]. *Anesth Analg*, 2020, 130 (6): 1670-1677
- [16] Asl BMH, Vatanchi A, Golmakani N, et al. Relationship between behavioral indices of pain during labor pain with pain intensity and duration of delivery[J]. *Electron Physician*, 2018, 10(1): 6240-6248
- [17] Yu WQ, Ji QL, Obstetrics DO. Effect of predictive nursing care in preventing constipation in pregnant women on expectant management [J]. *World Chinese J Digestology*, 2017, 11(2): e841
- [18] 陈文殊, 沈旭娜. 产间发热对不同产妇临床结局的影响分析[J]. *中国妇幼保健*, 2020, 35(7): 1219-1222
- [19] Liao Z, Xiong Y, Luo L. Low-dose spinal - epidural anesthesia for Cesarean section in a parturient with uncontrolled hyperthyroidism and thyrotoxic heart disease[J]. *J Anesthesia*, 2016, 30(4): 1-4
- [20] Chaurasia M, Saxena AK, Chilkoti GT. Comparison of Epi-dural Butorphanol with Neostigmine and Epidural Sufentanyl with Neostigmine for First Stage of Labor Analgesia: A Randomized Controlled Trial [J]. *Anesthesia Essays & Researches*, 2017, 11(2): 365-371
- [21] Zhang XL. Application of hormone replacement therapy in perimenopause[J]. *Experience Exchange*, 2018, 11(25): 111-112
- [22] Liu Y. Clinical effect of hormone replacement therapy on perimenopausal women[J]. *CCME*, 2016, 7(15): 149-150
- [23] Li HY. The effect of hormone replacement therapy on perimenopausal syndrome [J]. *Contemporary Medicine Forum*, 2014, 12(17): 189-190
- [24] Salpeter SR, Walsh JM, Ormiston TM, et al. Meta-analysis: effect of hormone-replacement therapy on components of the metabolic syndrome in postmenopausal women[J]. *Diabetes Obes Metab*, 2006, 8(5): 538-554
- [25] Higgins RD, Saade G, Polin RA, et al. Evaluation and management of women and newborns with a maternal diagnosis of chorioamnionitis: summary of a workshop[J]. *Obstet Gynecol*, 2016, 127(3): 426-436
- [26] Kodali BS, Choi L, Chau A, et al. Use of a novel non-invasive respiratory monitor to study changes in pulmonary ventilation during labor epidural analgesia[J]. *J Clin Monit Comput*, 2020, 34(3): 567-574
- [27] Zhou X, Li J, Deng S, et al. Ropivacaine at different concentrations on intrapartum fever, IL-6 and TNF- α in parturient with epidural labor analgesia[J]. *Exp Ther Med*, 2019, 17(3): 1631-1636
- [28] Del Arroyo AG, Sanchez J, Patel S, et al. Role of leucocyte caspase-1 activity in epidural-related maternal fever: a single-centre, observational, mechanistic cohort study [J]. *Br J Anaesth*, 2019, 122 (1): 92-102
- [29] 雷黎明, 沈晓凤, 李彩娟, 等. 分娩镇痛期间产间发热影响因素的 Logistic 回归分析[J]. *中国妇幼保健*, 2016, 31(24): 5251-5251
- [30] Armstrong-Wells J, Donnelly M, Post MD, et al. Inflammatory predictors of neurologic disability after preterm premature rupture of membranes[J]. *Am J Obstet Gynecol*, 2015, 212(2): 2121-2129
- [31] Tornell S, Ekeus C, Hultin M, et al. Low Apgar score, neonatal encephalopathy and epidural analgesia during labour: a Swedish registry-based study[J]. *Acta Anaesthesiol Scand*, 2015, 59 (4): 486-495

(上接第 677 页)

- [16] Ornoy A, Becker M, Weinstein-Fudim L, et al. Diabetes during Pregnancy: A Maternal Disease Complicating the Course of Pregnancy with Long-Term Deleterious Effects on the Offspring. A Clinical Review[J]. *Int J Mol Sci*, 2021, 22(6): 2965[Epub ahead of print]
- [17] EFSA Panel on Dietetic Products, Nutrition and Allergies (NDA); Scientific Opinion on the substantiation of a health claim related to oat beta-glucan and lowering blood cholesterol and reduced risk of (coronary) heart disease pursuant to Article 14 of Regulation (EC) No 1924/2006[J]. *EFSA Journal*, 2010, 8(12): 1885
- [18] Xu J, Ye S. Influence of low-glycemic index diet for gestational diabetes: a meta-analysis of randomized controlled trials[J]. *J Matern Fetal Neonatal Med*, 2020, 33(4): 687-692
- [19] Kintiraki E, Goulis DG. Gestational diabetes mellitus: Multi-disciplinary treatment approaches[J]. *Metabolism*, 2018, 86: 91-101
- [20] Huang XF, Yu Y, Beck EJ, et al. Diet high in oat β -glucan activates the gut-hypothalamic (PYY3-36-NPY) axis and increases satiety in diet-induced obesity in mice [J]. *Mol Nutr Food Res*, 2011, 55 (7): 1118-1121
- [21] Giannakou K, Evangelou E, Yiallourous P, et al. Risk factors for gestational diabetes: An umbrella review of meta-analyses of observational studies[J]. *PLoS One*, 2019, 14(4): e0215372
- [22] Li Y, Ren X, He L, et al. Maternal age and the risk of gestational diabetes mellitus: A systematic review and meta-analysis of over 120 million participants [J]. *Diabetes Res Clin Pract*, 2020, 162: 108044. [Epub ahead of print]
- [23] Viana LV, Gross JL, Azevedo MJ. Dietary intervention in patients with gestational diabetes mellitus: a systematic review and meta-analysis of randomized clinical trials on maternal and newborn outcomes[J]. *Diabetes Care*, 2014, 37(12): 3345-3355
- [24] Perichart-Perera O, Balas-Nakash M, Rodriguez-Cano A, et al. Low Glycemic Index Carbohydrates versus All Types of Carbohydrates for Treating Diabetes in Pregnancy: A Randomized Clinical Trial to Evaluate the Effect of Glycemic Control [J]. *Int J Endocrinol*, 2012, 2012: 296017[Epub ahead of print]