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孕妇生殖道 B 族链球菌感染与胎膜早破的关系及其对母婴预后和新生儿听力筛查的影响 *

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摘要 目的:探讨孕妇生殖道 B 族链球菌(GBS)感染与胎膜早破(PROM)的关系及其对母婴预后和新生儿听力筛查的影响。**方法:**选取 2017 年 1 月到 2019 年 1 月期间在我院接受治疗的 PROM 患者 100 例作为 PROM 组,另选取同期住院的正常妊娠孕妇 100 例作为对照组,PROM 组患者根据是否合并 GBS 感染分为 GBS 阳性组和 GBS 阴性组。比较 PROM 组和对照组的 GBS 阳性率,比较 GBS 阳性组和 GBS 阴性组早产、胎儿窘迫、新生儿窒息、新生儿肺炎、产褥感染的发生率及新生儿听力筛查的通过率。**结果:**PROM 组的 GBS 阳性率高于对照组,差异有统计学意义($P<0.05$)。GBS 阳性组早产、胎儿窘迫、新生儿窒息、新生儿肺炎、产褥感染的发生率均明显高于 GBS 阴性组,差异均有统计学意义($P<0.05$),GBS 阳性组在初筛和复筛时听力筛查通过率均低于 GBS 阴性组,差异均有统计学意义($P<0.05$)。**结论:**孕妇生殖道 GBS 感染与 PROM 密切相关,并可增加不良妊娠结局发生的风险,在一定程度上影响了新生儿的听力功能,对母婴预后造成不良影响。

关键词:感染;听力;B 族链球菌;妊娠结局;胎膜早破

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The Relationship between Genital Tract Group B Streptococcus Infection and Premature Rupture of Membranes in Pregnant Women and Its Effect on Maternal and Infant Prognosis, and Neonatal Hearing Screening*

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ABSTRACT Objective: To explore the relationship between group B streptococcus (GBS) infection and premature rupture of membranes (PROM) in pregnant women and its effect on maternal and infant prognosis, and neonatal hearing screening. **Methods:** 100 patients with PROM who were treated in our hospital from January 2017 to January 2019 were selected as the PROM group. Another 100 normal pregnant women who were hospitalized during the same period were selected as the control group. The patients in the PROM group were divided into GBS positive group and GBS negative group according to whether they were combined with GBS infection. The positive rates of GBS in the PROM group and the control group were compared, and the prevalence of premature delivery, fetal distress, neonatal asphyxia, neonatal pneumonia, puerperal infection, and neonatal hearing screening were compared between GBS positive group and GBS negative group. **Results:** The positive rate of GBS in the PROM group was higher than that in the control group, and the difference was statistically significant ($P<0.05$). The prevalence of premature delivery, fetal distress, neonatal asphyxia, neonatal pneumonia, and puerperal infection in GBS-positive group were significantly higher than those in GBS-negative group, the differences were statistically significant ($P<0.05$). The pass rate of hearing screening in GBS positive group was lower than that in GBS negative group at the time of initial screening and re-screening, and the difference was statistically significant ($P<0.05$). **Conclusion:** The genital tract GBS infection in pregnant women is closely related to PROM, and it can also increase the risk of adverse pregnancy outcomes, which will affect the hearing function of newborns to a certain extent and adversely affect the maternal and infant prognosis.

Key words: Infection; Hearing; Group B Streptococcus; Pregnancy outcomes; Premature rupture of membranes

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前言

B 族链球菌(group B streptococcus, GBS)是一种条件性致

病菌,常寄生于人体的泌尿生殖道和下消化道^[1]。近年来的研究发现^[2,3],GBS 是引起围产期感染的最常见的致病菌,GBS 引发的感染可导致羊膜绒毛膜炎、孕产妇败血症等多种感染性并发

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症,增加不良妊娠结局发生的风险。胎膜早破(premature rupture of membranes, PROM) 是指孕妇在临产前胎膜发生破裂,感染是 PROM 的重要危险因素之一,而 PROM 也可继发感染,二者相互影响^[4]。PROM 作为一种常见的妊娠中晚期的并发症可引起多种不良妊娠结局,如导致早产率、围生儿病死率、宫内感染率及产褥感染率的升高,因此如何有效避免 PROM 的发生成为临床重点关注的问题。新生儿的 GBS 感染绝大多数是经母体垂直传播,其可分为早发型和迟发型,与早发型相比,迟发型的并发症较多、预后较差,如新生儿迟发型 GBS 感染可引发脑膜炎,而约有 50% 的脑膜炎患儿会出现听力障碍、脑积水或语言发育障碍等后遗症^[5]。本研究分析了孕妇生殖道 GBS 感染与 PROM 的关系及其对母婴预后和新生儿听力筛查的影响,探讨孕妇生殖道 GBS 感染的危害性,现将研究结果整理报道如下。

1 资料与方法

1.1 一般资料

选取我院于 2017 年 1 月到 2019 年 1 月期间接收的 100 例 PROM 患者作为 PROM 组,另选取同期住院的正常妊娠孕妇 100 例作为对照组,纳入标准:(1)PROM 的诊断标准为孕妇主诉阴道流液增多,阴道液涂片检查找到羊水中形成成分,石蕊试纸显示阴道 PH 大于 6.5^[6];(2)均为单胎、头位;(3)均在我院进行生产;(4)年龄 20~35 岁;(5)患者及其家属对本次研究均知情同意。排除标准:(1)有孕期其他合并症者;(2)合并有抑郁、焦虑等不良情绪者;(3)孕妇既往有吸烟、饮酒等嗜好,有吸毒史;(4)PROM 不能排除人为因素者;(5)合并有恶性肿瘤或重要脏器功能障碍者。两组孕妇的一般资料比较无明显差异($P>0.05$),具体数据如表 1 所示,可作组间比较。本次研究通过了我院伦理委员会的审核。

表 1 两组孕妇的一般资料比较

Table 1 Comparison of general data between the two groups of subjects

Groups	n	Age (years)	Body mass index (kg/m ²)	Pregnancy times (times)	Parity (times)
PROM group	100	28.16± 5.41	26.26± 1.58	1.86± 0.33	0.92± 0.16
Control group	100	27.69± 4.88	25.97± 1.64	1.76± 0.47	0.88± 0.27
t		0.645	1.273	1.741	1.275
P		0.520	0.204	0.083	0.204

1.2 GBS 检测方法

患者取截石位,均采集其两根拭子的标本(一根采集阴道标本,一根采集直肠标本)。阴道拭子采集:将拭子插入阴道下 1/3 处,轻轻转动拭子,在阴道粘膜壁上蘸取分泌物;直肠拭子采集:小心将拭子插入肛门,超过括约肌 2-3 cm,轻轻转动拭子,采集肛周隐窝处标本。将标本置于 B 群链球菌筛查培养基上,在 35℃、含 5% CO₂ 培养箱中培养 18-24 h,采用法国梅里埃公司的 VITEK2compact 全自动微生物鉴定仪进行鉴定。

1.3 观察指标

比较 PROM 组和对照组的 GBS 阳性率,PROM 组患者根据是否合并 GBS 感染分为 GBS 阳性组和 GBS 阴性组,比较 GBS 阳性组和 GBS 阴性组早产、胎儿窘迫、新生儿窒息、新生儿肺炎、产褥感染的发生率。采用探索自动听觉脑干诱发电位技术对 GBS 阳性组和 GBS 阴性组的新生儿进行听力筛查,于新生儿出生后的 3-5 d 进行首次筛查,对于首次筛查未通过或可疑的新生儿在出生 42 d 内进行再次筛查,比较初筛和复筛

中两组新生儿听力的通过率。

1.4 统计学方法

文中数据均采用 SPSS22.0 统计软件进行统计分析,计数资料采用率(%)描述,采用卡方检验或 Fisher 确切概率计算法,计量资料经检验均符合正态分布,采用均数± 标准差($\bar{x} \pm s$)描述,采用 t 检验。若 $P<0.05$,则认为差异有统计学意义。

2 结果

2.1 PROM 组和对对照组的 GBS 阳性率比较

PROM 组的 GBS 阳性率为 23.00%(23/100),对照组的 GBS 阳性率为 5.00%(5/100),两组的 GBS 阳性率比较差异有统计学意义($\chi^2=13.455, P=0.000$)。

2.2 GBS 阳性组和 GBS 阴性组母婴预后比较

GBS 阳性组早产、胎儿窘迫、新生儿窒息、新生儿肺炎、产褥感染的发生率均明显高于 GBS 阴性组,差异均有统计学意义($P<0.05$),具体数据如表 2 所示。

表 2 GBS 阳性组和 GBS 阴性组母婴预后比较[n(%)]

Table 2 Comparison of maternal and infant prognosis between GBS positive group and GBS negative group[n(%)]

Groups	n	The prevalence of premature delivery	Fetal distress	Neonatal asphyxia	Neonatal pneumonia	Puerperal infection
GBS positive group	23	5(21.74)	6(26.09)	4(17.39)	4(17.39)	8(34.78)
GBS negative group	77	3(3.90)	6(7.79)	1(1.30)	2(2.60)	5(6.49)
χ^2		5.428	3.014	6.565	3.500	10.155
P		0.000	0.025	0.000	0.004	0.000

2.3 GBS 阳性组和 GBS 阴性组新生儿的听力筛查通过率比较 阴性组,差异均有统计学意义($P<0.05$),具体数据如表 3 所示。
GBS 阳性组在初筛和复筛时听力筛查通过率均低于 GBS

表 3 GBS 阳性组和 GBS 阴性组新生儿的听力筛查通过率比较

Table 3 Comparison of hearing screening pass rates between GBS positive group and GBS negative group

Groups	n	Primary screening				Re-screenin			
		Sieve number	Actual sieve number	Primary screening rate(%)	Passing rate (%)	Sieve number	Actual sieve number	Re-screening rate(%)	Passing rate (%)
GBS positive group	23	23	23	100.00	16(69.57)	7	7	100.00	2(28.57)
GBS negative group	77	77	77	100.00	73(94.81)	4	4	100.00	4(100.00)
χ^2 value					9.090				
P value					0.000				0.015#

Notes: #in order to use Fisher's exact probability calculation method to calculate.

3 讨论

GBS 为需氧型革兰阳性链球菌,它是一种条件致病菌,一般正常健康人群感染 GBS 并不致病^[7,8]。妊娠期 GBS 感染的危害远高于非妊娠人群,且妊娠期 GBS 感染的发生率较高,这主要是因为妊娠期女性由于阴道 PH 值的改变易出现菌群失调,且体内糖原含量增加,这些变化为 GBS 的繁殖提供了有利条件,因此妊娠期 GBS 感染的风险较高^[9,10]。流行病学调查显示^[11],我国妊娠期 GBS 带菌率为 8.33%~11.8%左右,而国外的带菌率稍高,在 8%~22.76%左右^[12]。GBS 可导致孕产妇发生感染性并发症,同时增加胎儿不良妊娠结局发生的风险,甚至可导致围产儿死亡。国外对妊娠期 GBS 感染的危害性认识较早,早在 20 世纪 90 年代即开始实施产前 GBS 筛查与产时抗生素干预,并制定了相关指南或共识来指导临床,而我国近些年才逐渐认识、重视妊娠期 GBS 感染对母婴预后的不良影响,但目前尚缺乏一致的预防措施^[13-15]。感染是引起 PROM 的最重要原因,而 GBS 是围产期感染中的第一位致病菌,PROM 患者是否更易出现生殖道 GBS 感染,GBS 感染是否增加 PROM 发生的风险,二者之间的关系值得进一步研究。新生儿 GBS 感染多通过母体垂直传播,因此孕妇出现生殖道 GBS 感染可增加新生儿 GBS 感染的风险,新生儿 GBS 感染可引起多种严重的并发症,并可导致听力障碍等神经系统后遗症,因此很有必要对可能存在 GBS 感染的新生儿进行听力筛查。本研究旨在分析孕妇产道 GBS 感染与 PROM 的关系及其对母婴预后和新生儿听力筛查的影响,以引起人们对于妊娠期生殖道 GBS 感染的重视,做到早发现、早治疗,从而减少围产期并发症,改善母婴预后。

本研究结果显示,PROM 组的 GBS 阳性率高于对照组,这说明 PROM 患者的生殖道 GBS 感染风险较高。PROM 是产科最常见的并发症之一,感染即是 PROM 的重要致病因素,同时也是 PROM 的并发症之一,感染与 PROM 相互作用,相互促进。GBS 是常见的感染病原体,其对绒毛有较强吸附能力和穿透能力,侵入绒毛膜后可通过炎症细胞的吞噬作用降低胎膜局部张力,进而增加 PROM 发生的风险^[16,17]。陈翠英等人的研究

也显示^[18],PROM 孕妇的生殖道 GBS 感染高于健康孕妇,与本研究结果一致。此外,本研究结果还显示,GBS 阳性组早产、胎儿窘迫、新生儿窒息、新生儿肺炎、产褥感染的发生率均明显高于 GBS 阴性组,这说明 GBS 感染可进一步增加 PROM 孕妇不良妊娠结局的发生率,影响母婴预后。PROM 本身可导致不良妊娠结局的发生,胎膜破裂后,细菌经破裂的胎膜上行进入子宫腔引起感染,进而引发一系列的并发症^[19-21]。生殖道的 GBS 沿生殖道继续上行可引起胎儿宫内感染,GBS 及其毒性产物可促进前列腺素、磷脂酶 A2、白介素、肿瘤坏死因子等因子的分泌,促进机体的炎症反应,刺激子宫收缩,进而增加胎儿窘迫、新生儿窒息、早产等不良妊娠结局的发生率^[22-24]。新生儿 GBS 感染多通过母体垂直传播,经产道分娩时新生儿吞进和吸入 GBS 菌可导致严重的并发症,如新生儿肺炎、败血症、脑膜炎等,若未及时治疗可造成新生儿死亡或神经系统后遗症^[25-27]。听力障碍是新生儿 GBS 感染神经系统后遗症的常见类型,本研究结果显示,GBS 阳性组在初筛和复筛时听力筛查通过率均低于 GBS 阴性组,这主要是因为 GBS 可经母体垂直传播,而 GBS 是新生儿脑膜炎的常见致病,而新生儿脑膜炎可在一定程度上影响新生儿的听力功能,因此孕妇生殖道 GBS 感染也会在一定程度上影响新生儿的听力功能^[28-30]。

综上所述,孕妇生殖道 GBS 感染与 PROM 密切相关,并增加不良妊娠结局发生的风险,会在一定程度上影响新生儿的听力功能,对母婴预后造成不良影响。临床应重视孕妇生殖道 GBS 感染的危害性,进行产前 GBS 筛查与产时抗生素干预,以减少 GBS 感染对母婴预后造成的不良影响。

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