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牛肺磷脂注射液在呼吸窘迫综合征患儿正压通气中的应用*

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摘要 目的:探讨牛肺磷脂注射液联合呼吸机鼻塞式持续正压通气治疗新生儿呼吸窘迫综合征的疗效。**方法:**98例呼吸窘迫综合征新生儿为研究对象,随机数字法分为两组。对照组应用呼吸机鼻塞式持续正压通气治疗,研究组应用牛肺磷脂注射液联合治疗。**结果:**研究组有效率高于对照组($P<0.05$);治疗前两组患儿的动脉血气指标无明显差异,治疗后,研究组12h及24h后的 PaO_2 、血pH水平高于对照组, PaCO_2 水平低于对照组,两组差异有统计学意义($P<0.05$);治疗前两组患儿的胸部X线情况对比无明显差异,治疗后,研究组胸部X线各项情况的改善均优于对照组,两组差异有统计学意义($P<0.05$);研究组用机时间、住院时间均短于对照组($P<0.05$);研究组并发症的发生率低于对照组,两组差异有统计学意义($P<0.05$)。**结论:**牛肺磷脂注射液联合呼吸机鼻塞式持续正压通气治疗新生儿呼吸窘迫综合征效果理想,能够改善患儿的动脉血气指标,提高治疗的效果,缩短患儿的用机及住院时间。

关键词:新生儿呼吸窘迫综合征;呼吸机鼻塞式持续正压通气;牛肺磷脂注射液

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Application of Bovine Lung Phospholipid Injection in Positive Pressure Ventilation in Children with Respiratory Distress Syndrome*

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ABSTRACT Objective: To investigate the clinical study of bovine pulmonary phospholipid injection combined with ventilator continuous positive pressure ventilation in the treatment of neonatal respiratory distress syndrome. **Methods:** A total of 98 children with respiratory distress syndrome were chosen as research subjects and were randomly divided into two groups. The control group was treated with continuous positive pressure ventilation with nasal congestion with a ventilator, and the study group was treated with bovine lung phospholipid injection on the basis of the control group's therapy. **Results:** The effective rate of the study group was higher than that of the control group ($P<0.05$). There was no significant difference in arterial blood gas indexes between the two groups before treatment. 12 h and 24 h after treatment, the PaO_2 and blood pH levels of the study group were higher than those of the control group, and the PaCO_2 level, lower than that of the control group, the difference between the two groups was statistically significant ($P<0.05$). Before treatment, there was no significant difference in the chest X-ray conditions between the two groups; after treatment, the improvement of the study group's chest X-ray conditions was better than that of the control group, the difference between the two groups was statistically significant ($P<0.05$). The time of use of the machine and hospital stay of the study group were shorter than those of the control group ($P<0.05$); the incidence of complications in the study group was lower than that in the control group, the difference between the two groups was statistically significant ($P<0.05$). **Conclusion:** In the treatment of neonatal respiratory distress syndrome, the therapeutic effect of bovine pulmonary phospholipid injection combined with ventilator nasal continuous positive pressure ventilation is ideal, which can effectively improve the arterial blood gas index of children, improve the therapeutic effect, shorten the machine and hospital stay of children, and is worthy of clinical application.

Key words: Neonatal respiratory distress syndrome; Ventilator nasal continuous positive pressure ventilation; Bovine pulmonary phospholipid injection

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前言

牛肺磷脂注射液能够吸附在人体肺泡气液的界面,能够有

效降低其表面的张力,从而预防肺泡萎陷、肺水肿等的发生,是引起新生儿致残、致死的重要危险症状^[1]。临床中对于新生儿呼吸窘迫综合征的治疗中,应用机械通气联合牛肺磷脂注射液相

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关的文献较多,均证实联合给予患儿干预能够有效的改善预后^[2]。但是临床中对于呼吸机鼻塞式持续正压通气联合牛肺磷脂注射液应用于新生儿呼吸窘迫综合征相关的文献较少^[3]。本文为探讨牛肺磷脂注射液联合呼吸机鼻塞式持续正压通气治疗新生儿呼吸窘迫综合征的临床研究,希望能为后期的研究提供依据,现报道如下。

1 资料与方法

1.1 一般资料

选取 2018 年 1 月-2020 年 6 月在我院进行新生儿呼吸窘迫综合征治疗的患儿 98 例为研究对象,随机数字法分为两组,对照组 49 例,研究组 49 例。

纳入标准:① 患儿临床症状符合《实用新生儿学》(第 3 版)中对新生儿呼吸窘迫综合征的诊断标准;② 患儿家属知情并同意本次研究;③ 根据胸片诊断两组患儿的新生儿呼吸窘迫综合征均为 II-IV 级;所有患儿均符合上述所有条件方可纳入。排除标准:① 患儿患有先天性的肺部、心脏等疾病;② 患儿家属放弃治疗,有上述一项者则排除。

研究组男 26 例,女 23 例,胎龄 29-38 周,平均胎龄(32.5±1.5)周,出生至病发时间 0.8-11.9 h,平均时间(6.2±2.0)h。对照组男 25 例,女 24 例,胎龄 28-37 周,平均胎龄(31.5±2.0)周,出生至病发时间 1.1-12.29 h,平均时间(6.5±2.0)h。两组患儿的一般资料具有可比性($P>0.05$),经过医院伦理委员会批准。

1.2 方法

对照组应用呼吸机鼻塞式持续正压通气治疗,研究组应用牛肺磷脂注射液联合呼吸机鼻塞式持续正压通气治疗,呼吸机鼻塞式持续正压通气的方法与对照组完全一样。呼吸机鼻塞式持续正压通气:其中对患儿应用呼吸机(科曼新生儿无创呼吸机 NV8,科曼医疗设备有限公司)行机械通气法,模式应用

NIPPV 或 NCPAP 通气模式。持续充气复张肺泡,以 20-25 cmH₂O 压力给予患儿持续通气,呼气末压维持在 5-6 cmH₂O,维持患儿的各项指标如下:pH>7.25,PaCO₂(动脉血二氧化碳分压)30-50 mmHg,PaO₂(动脉血氧分压)50-70 mmHg。

牛肺磷脂注射液:给予患儿牛肺磷脂注射液(珂立苏)干预(国药准字 H20052128,华润双鹤药业股份有限公司,70 mg),用量根据患儿的体重进行选择,标准为 70-100 mg/kg,将选择好的牛肺磷脂注射液注入 2 mL 质量分数为 0.9%的氯化钠溶液中稀释摇匀,清理患儿的呼吸道后将稀释液经气管插管导管注入患儿的肺内。

1.3 观察指标

(1)对比两组的疗效,显效:治疗后患儿的呼吸平稳,临床症状消失,辅助检查指标正常;有效:治疗后患儿的呼吸轻微急促,临床症状明显缓解,辅助检查指标好转;治疗后各项指标均未达上述标准^[4]。(2)分别在治疗前、治疗 12 h 后及 24 h 后对比两组的动脉血气指标,包括 PaO₂、PaCO₂ 及血 pH^[5]。(3)分别在治疗前及治疗后应用胸部 X 线观察两组的两肺野透亮度减低、支气管充气症状及肺缘模糊,分析症状改善的情况^[6]。(4)记录两组在住院期间应用呼吸机的时间以及住院时间^[7]。(5)两组并发症(动脉导管未闭、气胸、支气管肺发育不全、早期败血症)发生率^[8]。

1.4 统计学方法

数据应用 SPSS18.0 进行分析,其中计数进行 χ^2 (%)检验,计量进行 t 检测($\bar{x} \pm s$)检验, $P<0.05$ 提示有显著差异。

2 结果

2.1 两组治疗效果对比

研究组加用牛肺磷脂注射液治疗后,有效率高于对照组,两组差异有统计学意义($P<0.05$),具体见表 1。

表 1 两组治疗效果对比(n,%)

Table 1 Comparison of therapeutic effects between two groups(n,%)

Groups	n	Significantly effective	Effective	Invalid	To be efficient
The control group	49	23(46.94)	16(32.65)	10(20.41)	39(79.59)
The team	49	27(55.10)	20(40.82)	2(4.08)	47(95.92)
χ^2 values	/	/	/	/	5.043
P values	/	/	/	/	<0.05

2.2 两组动脉血气指标对比

治疗前两组患儿的动脉血气指标无明显差异,不具有统计学意义($P>0.05$),研究组加用牛肺磷脂注射液治疗 12 h 及 24 h 后的 PaO₂、血 pH 水平高于对照组,PaCO₂ 水平低于对照组,两组差异有统计学意义($P<0.05$),具体见表 2。

2.3 两组胸部 X 线情况对比

治疗前两组患儿的胸部 X 线情况对比无明显差异,不具有统计学意义($P>0.05$),研究组加用牛肺磷脂注射液治疗后,胸部 X 线各项情况的改善均优于对照组,两组差异有统计学意义($P<0.05$),具体见表 3。

2.4 两组用机、住院时间对比

研究组加用牛肺磷脂注射液治疗后,用机时间、住院时间均短于对照组,两组差异有统计学意义($P<0.05$),具体见表 4。

2.5 两组并发症发生率比较

研究组的并发症(动脉导管未闭、气胸、支气管肺发育不全、早期败血症)发生率小于对照组($P<0.05$)。见表 5。

3 讨论

新生儿呼吸窘迫综合征是新生儿出生后多发的症状,是一种以进行性呼吸困难、呼吸衰竭为主的表现症状^[9]。临床有关数据发现,早产儿发生新生儿呼吸窘迫综合征的几率高于足月儿,该种症状的发生是由于患儿缺乏肺表面活性物质引起的^[10]。

肺表面活性物质能够降低人体肺泡气液界面的张力,从而维持保持肺部的顺应性,对肺泡上皮细胞起到有效的保护作用,对肺泡的稳定有着重要的作用^[11]。肺表面活性物质缺乏会引起肺泡萎缩,降低肺泡液的吸收,肺泡两侧压力差引起血浆进入人

体的肺泡内,形成透明膜,最终引起患儿呼吸功能不全,引发疾病,因此其治疗的原则是尽早的通过干预来改善患儿呼吸功能不全的问题^[12]。

表 2 两组动脉血气指标对比($\bar{x} \pm s$)

Table 2 Comparison of arterial blood gas indexes between two groups before and after treatment(score, $\bar{x} \pm s$)

Groups	Time	PaO ₂ (mmHg)	PaCO ₂ (mmHg)	Blood pH
The team	Before treatment	41.78± 4.24	50.92± 5.11	7.16± 0.08
	After 12 h of treatment ^{ab}	72.05± 5.73	39.84± 3.11	7.35± 0.07
	After 24 h of treatment ^a	80.25± 8.15	37.66± 2.78	7.37± 0.05
The control group	Before treatment	41.79± 4.62	51.04± 4.97	7.17± 0.06
	After 12 h of treatment ^{ab}	61.83± 5.90	43.31± 4.05	7.29± 0.04
	After 24 h of treatment ^a	70.42± 7.94	41.89± 2.31	7.32± 0.06

Note: intra-group comparison ^a $P < 0.05$; The comparison between groups was ^b $P < 0.05$.

表 3 两组胸部 X 线情况对比(n,%)

Table 3 Comparison of chest X-ray before and after treatment between two groups(n,%)

Groups	n	The transmittance of both lung fields is reduced		Bronchoaeration symptom		Lung edge fuzzy	
		Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment
The control group	49	24(48.98)	5(10.20)	14(28.57)	4(8.16)	10(20.41)	2(4.08)
The team	49	26(53.06)	2(4.08)	15(30.61)	1(2.04)	9(18.36)	0(0.00)
χ^2 values	/	1.621	5.735	1.773	6.035	1.508	5.905
P values	/	>0.05	<0.05	>0.05	<0.05	>0.05	<0.05

表 4 两组用机、住院时间对比($\bar{x} \pm s$)

Table 4 Comparison of machine use and hospital stay between two groups($\bar{x} \pm s$)

Groups	n	Machine time (h)	Hospital stay (d)
The control group	49	95.5± 17.3	16.8± 2.6
The team	49	77.4± 9.4	12.5± 3.2
T values	/	18.957	19.035
P values	/	<0.05	<0.05

表 5 两组并发症发生率比较(n,%)

Table 5 Comparison of complication rates between two groups(n,%)

Groups	n	Patent ductus arteriosus	pneumothorax	Bronchopulmonary hypoplasia	Early septicemia	Complication rate
The team	49	1(2.04)	1(2.04)	1(2.04)	0(0.00)	3(6.12)
The control group	49	3(6.12)	4(8.16)	2(4.08)	2(4.08)	11(22.45)
χ^2 values	/	/	/	/	/	7.092
P values	/	/	/	/	/	<0.05

临床中治疗新生儿呼吸窘迫综合征常用的方式是传统机械通气联合牛肺磷脂注射液治疗过程中患儿机械性相关肺炎及机械性相关肺损伤的发生率较高^[13]。传统机械通气时通过较大的吸气峰压、潮气量来维持患儿的肺泡扩张、血气指标^[14]。但是新生儿呼吸窘迫综合征患儿往往有着肺泡水肿、肺间质水肿

等特点,容易引起各种并发症的发生,不利于患者临床的治疗与康复^[15]。随着医疗手段及医学模式的不断进步,有学者提出,在给予患者应用机械通气时,其目的应当是以最小的呼吸支持来维持或者达到 " 合适的气体交换 ", 在干预的过程中应当注重保护患者的各项重要脏器功能,降低并发症的发生,提出了

呼吸机鼻塞式持续正压通气^[16,17]。但是临床中对于在新生儿呼吸窘迫综合征应用相关的文献较少。在本次的研究中,我们对研究组患儿应用牛肺磷脂注射液联合呼吸机鼻塞式持续正压通气进行治疗效果良好,为后期患儿肺部功能的恢复提供了有效的依据^[18]。

新生儿呼吸窘迫综合征主要是维持患儿更多肺泡处在开放状态,防止呼气末肺泡萎缩的发生,其实是调节患儿具有足够大的呼气末正压。确定呼气末正压后为防止吸气末肺容积过大现象的发生,这就需要控制潮气量,从而降低容积伤及气压伤,逐渐升高动脉血氧分压。在本次的研究中,给予患儿联合应用牛肺磷脂注射液接受治疗,取得了良好的效果。牛肺磷脂注射液是在牛肺中提取的活性物质,特异性蛋白、磷脂是该种物质的主要成分,能够明显降低肺泡表面的张力,促进肺泡的稳定性,从而预防肺泡萎陷的发生,对肺的顺应性、气体交换有着明显的改善作用。临床中有研究显示,给予患儿牛肺磷脂注射液联合无创呼吸机治疗后,患儿的血气指标明显的改善^[19]。PaCO₂ 指标可以判断患者肺泡的通气状态,该指标升高表示患者可能会出现通气受阻现象。PaO₂ 主要是判断患者气道内的含氧量,是缺氧的敏感指标,该指标下降表示患者可能会出现肺部换气及呼气功能异常导致氧气供应量不足,因此在新生儿呼吸窘迫综合征的治疗中可以将两者作为治疗效果的指标判断^[20]。在本次的研究中,结果显示,牛肺磷脂注射液联合呼吸机鼻塞式持续正压通气在治疗后各个时间段血气指标的改善均优于单应用呼吸机鼻塞式持续正压通气,表示联合应用的价值更高^[21]。

对新生儿呼吸窘迫综合征患儿进行胸部 X 线检查,通常会伴有两肺野透亮度减低、支气管充气征及肺缘模糊等症状^[22]。在这次的研究中,在治疗前后对两组进行 X 线检查,结果显示:研究组加用牛肺磷脂注射液治疗后,胸部 X 线各项情况的改善均优于对照组,两组差异有统计学意义($P < 0.05$);表示在新生儿呼吸窘迫综合征的治疗中,联合应用后能够提高不良症状的改善,有利于肺部功能的恢复^[23]。牛肺磷脂注射液的应用能够降低患儿气胸、肺间质性水肿诱发的危险,对患儿肺部的通气、换气功能起到迅速的改善,最终改善机体的缺氧状态^[24]。随着患儿呼吸功能的有效改善,其对机械通气的依赖度也会逐渐的降低,本次的研究结果显示:研究组加用牛肺磷脂注射液治疗后,用机时间、住院时间均短于对照组,两组差异有统计学意义($P < 0.05$),进一步说明联合应用的价值更高。但是本次研究还存在着许多不足之处,观察的指标、样本等数据较少,因此后期的研究中应加大观察样本、指标等,从而能够获取更准确的实验结果^[25]。

综上所述,新生儿呼吸窘迫综合征的治疗过程当中,牛肺磷脂注射液联合呼吸机鼻塞式持续正压通气的治疗效果理想,能够有效的改善患儿的动脉血气指标,提高治疗的效果,缩短患儿的用机及住院时间。

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