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无创辅助呼吸治疗用于重症肺炎所致呼吸衰竭患儿临床抢救价值*

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摘要 目的:探讨无创辅助呼吸治疗用于重症肺炎所致呼吸衰竭患儿的临床抢救价值。**方法:**选择我院 2016 年 5 月至 2019 年 5 月间收治的重症肺炎所致的呼吸衰竭患儿 80 例,按照随机数字表法分为研究组 42 例和对照组 38 例,对照组给予常规抗感染、吸氧、止咳、平喘等疗法,研究组在常规治疗的基础上联合使用无创辅助呼吸机进行治疗,对比观察两组的抢救价值。**结果:**研究组治疗后临床总有效率为 92.86%,明显高于对照组 76.32%($P<0.05$);治疗后两组 PaO_2 、pH 值水平均明显升高, PaCO_2 、心率和呼吸频率明显降低,研究组改变程度优于对照组($P<0.05$);治疗后两组 MMF、PEF、PI_{max}、PE_{max} 等各项肺功能指标水平均明显升高,研究组升高程度明显优于对照组($P<0.05$)。**结论:**无创辅助呼吸治疗重症肺炎所致呼吸衰竭,能够有效提高患儿的临床治疗效果,改善血气分析、心率、呼吸频率等指标的水平,提高患儿肺功能,具有操作简单、安全性高、效果可靠的优点,可在临床范围内推广使用。

关键词:重症肺炎;呼吸衰竭;无创呼吸机;辅助呼吸;肺功能

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The Value of Non-invasive Assisted Respiratory Rherapy for Clinical Rescue of Children with Respiratory Failure Caused by Severe Pneumonia*

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ABSTRACT Objective: To investigate the clinical rescue value of noninvasive assisted respiratory therapy in children with respiratory failure caused by severe pneumonia. **Methods:** Eighty children with respiratory failure caused by severe pneumonia admitted from May 2016 to May 2019 in our hospital were enrolled in the study. According to the random number table method, 42 patients in the study group and 38 patients in the control group were compared. The children in the group were given conventional anti-infective, oxygen-absorbing, anti-cough, anti-asthmatic and other treatments. The study group was treated with non-invasive assisted ventilator on the basis of conventional treatment, and the rescue value of the two groups was compared. **Results:** The total effective rate of the study group was 92.86%, which was significantly higher than that of the control group (76.32%) ($P<0.05$). After treatment, the PaO_2 and pH levels of the two groups were significantly increased, PaCO_2 , heart rate and respiratory rate, the degree of change in the study group was significantly lower than that in the control group ($P<0.05$). After treatment, the levels of MMF, PEF, PI_{max}, PE_{max} and other lung function indexes were significantly increased, the degree of elevation in the study group was significantly better than that in the control group ($P<0.05$). **Conclusion:** Non-invasive assisted breathing therapy for children with respiratory failure caused by severe pneumonia can effectively improve the clinical treatment effect of children, improve the blood gas analysis, heart rate, respiratory rate and other indicators, improve the lung function of children, and has simple operation and safety. The advantages of high efficiency and reliable performance can be promoted and used in the clinical scope.

Key words: Severe pneumonia; Respiratory failure; Non-invasive ventilator; Assisted breathing; Lung function

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前言

重症肺炎是临床上常见的肺炎较为严重的类型,一般由病原微生物感染后引起,具有病情进展迅速、致死性高,这类患儿

往往出现气体交换严重障碍、高碳酸血症、持续低氧血症等容易造成呼吸衰竭的发生,如果抢救不及时会造成患儿死亡,由此可见,重症肺炎的治疗已经成为儿科疾病预防的重大课题。对于出现呼吸衰竭的重症肺炎患儿来说,进行及时有效的机械

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通气是临床抢救的重要手段之一^[1]。目前常用的机械通气根据与患者的连接方式可分为有创和无创两大类,有创虽能挽救重症肺炎患儿的生命,但是长时间使用可引发呼吸机相关性肺炎、气漏等并发症,不利于患者预后,目前无创治疗作为常用的治疗方式,能有效的稳定了患儿的呼吸动力与潮气量,但是对于无创辅助呼吸抢救呼吸衰竭患儿的应用价值尚未达到统一的标准,对呼吸支持的力度不够,可能会出现呼吸性或代谢性酸中毒等^[2]。因此,本研究将我院近一年来收治的 80 例由重症肺炎所致呼吸衰竭患儿作为研究对象,随机分组后部分患儿在常规治疗的基础上联合使用无创呼吸机辅助呼吸治疗,为重症肺炎患儿的治疗提供详细的方案,现报告如下。

1 资料与方法

1.1 一般资料

选择我院 2016 年 5 月至 2019 年 5 月间收治的重症肺炎所致的呼吸衰竭患儿 80 例,按照随机数字表法分为两组,研究组:男 22 例,女 20 例,年龄 3~36 月龄,平均年龄 23.46 ± 2.25 月,Ⅰ型呼吸衰竭 23 例,Ⅱ型 19 例;对照组:男 20 例,女 18 例,年龄 2~36 月龄,平均年龄 21.23 ± 2.36 月,Ⅰ型呼吸衰竭 21 例,Ⅱ型 17 例;两组一般资料无差异($P > 0.05$),有可比性。

1.2 纳入和排除标准

纳入标准:均符合重症肺炎和中重度呼吸衰竭的诊断标准,实验室指标白细胞和中性粒细胞计数显著升高,痰液培养呈阳性,胸部 X 线片检查双肺存在浸润^[3,4];气道有大量分泌物或黏稠痰液,导致通气困难患儿;患儿家属均明白本研究的方法、原理,并知情同意,获得本院伦理委员会批准;能全程配合治疗。

排除标准:合并有心脑血管系统疾病患儿;合并精神障碍的患儿;依从性差或不配合患儿;先天性呼吸系统功能发育不全的患儿。

退出机制:由于个人、家庭原因中途放弃治疗患儿;治疗期间发生严重不良事件或不良反应患儿;治疗期间病情急剧恶化无法继续调研患儿。

1.3 方法

对照组:患儿入院后给予常规抗感染治疗,根据患儿的症状给予对症支持疗法,如兴奋呼吸肌,扩张支气管,缓解气管痉挛,止咳、平喘、镇静等疗法。

研究组:在对照组治疗的基础上给予无创呼吸机辅助呼吸治疗,患儿均给予咪唑安定与芬太尼泵维持基础的镇痛镇痛,根据患儿年龄给予佩戴合适的面罩,调节呼吸机参数:1.16~1.764 kPa 的吸气压力,0.294~0.784 kPa 的呼气压力,40%~55% 的氧浓度和 10~16 次/min 的呼吸频率^[5,6],治疗前,患儿先通气 2~3 次/d,每次持续 3~6 h,随后根据治疗的情况及时调整呼吸机的参数,使患儿改为间断性的鼻导管吸氧,为了保证患儿呼吸道通畅,避免痰液阻塞呼吸道,可进行相应的护理措施干预,待患儿病情稳定后可改为 4~6 h/次通气^[7],1~2 次/d 的治疗方案。两组均治疗 10 d。

1.4 观察指标

治疗效果:显效:每次治疗 12~24 h 后临床症状均明显改善,血气指标达到正常标准;有效:治疗 24 h 内症状有一定的改善,血气指标未达到正常标准;无效:24 h 内临床症状无改善或者恶化^[8]。

在治疗前 30 min 和治疗后 12 h 分别采集每位患儿股动脉血进行血气指标 PaO_2 和 PaCO_2 的分析,同时检测血液 pH 值,呼吸频率和心率等指标^[9-11]。

肺功能:检测患儿入院后及治疗 10 d 后的肺功能指标,使用肺功能检测仪监测每组患儿最大呼吸中段流量(MMF)、峰流速(PEF)、最大吸气压(PImax)、最大呼气压(PEmax)等指标。

1.5 统计学方法

使用 SPSS21.0 软件处理所得的数据,计数资料用%表示,行卡方检验,计量资料用($\bar{x} \pm s$)表示,行 t 检验, $P < 0.05$ 有统计学意义。

2 结果

2.1 临床疗效对比

研究组治疗的总有效率明显高于对照组($P < 0.05$),见表 1。

表 1 临床疗效对比

Table 1 Comparison of clinical treatment effects

Groups	Cases	Significant effect	Effective	Invalid	Total efficiency
Research group	42	22(52.38)	18(42.86)	2(4.76)	39(92.86)*
Control group	38	15(39.47)	14(36.84)	9(23.68)	29(76.32)

Note: * $P < 0.05$ means compared with the control group.

2.2 治疗前后血气指标、pH 值、心率和呼吸频率对比

治疗前各项指标比较差异不显著($P > 0.05$),治疗后两组 PaO_2 、pH 值水平均明显升高, PaCO_2 、心率和呼吸频率明显降低,研究组改变程度优于对照组($P < 0.05$),见表 2。

2.3 治疗前后肺功能状态对比

治疗前各项指标比较差异不显著($P > 0.05$),治疗后两组 MMF、PEF、PImax、PEmax 水平均明显升高,且研究组优于对照组($P < 0.05$),表 3。

3 讨论

肺炎是新生儿临床较为常见的呼吸系统疾病,主要病变为肺泡组织充血、水肿、炎性细胞浸润等^[12,13],如果患儿未得到及时有效的治疗,病情会进一步进展为重症肺炎^[14,15],最终会引起呼吸衰竭,严重者致死,因此对于这类患儿的有效治疗就显得十分重要^[16,17]。机械通气是临床十分常见的抢救方案,其中无创机械通气是其中的一种类型^[18,19],该技术是不需建立人工呼吸

表 2 治疗前后血气指标、pH 值、心率和呼吸频率对比

Table 2 Comparison of blood gas index, pH value, heart rate and respiratory rate before and after treatment

Groups	Subgroup	PaO ₂ (mmHg)	PaCO ₂ (mmHg)	pH	Heart rate (times / min)	Respiratory frequency (times / min)
Research group (n=42)	Before treatment	48.49± 8.12	81.62± 6.73	7.22± 0.04	105.86± 4.98	30.48± 5.24
	After treatment	76.61± 5.28* [#]	51.38± 6.29* [#]	7.35± 0.03* [#]	84.28± 6.45* [#]	20.11± 3.18* [#]
Control group (n=38)	Before treatment	48.11± 8.23	81.54± 6.65	7.24± 0.05	105.44± 4.86	30.56± 5.19
	After treatment	70.04± 7.21*	76.39± 5.20*	7.25± 0.03	98.19± 6.38	26.34± 4.98*

Note: * $P < 0.05$ means compared with before treatment, [#] $P < 0.05$ means compared with the control group after treatment.

表 3 治疗前后肺功能状态对比

Table 3 Comparison of pulmonary function status before and after treatment

Groups	Subgroup	MMF(L/s)	PEF(L/s)	Plmax(%)	PEmax(%)
Research group(n=42)	Before treatment	0.68± 0.12	1.08± 0.09	60.42± 4.27	31.02± 2.24
	After treatment	1.57± 0.20* [#]	1.98± 0.22* [#]	82.11± 5.12* [#]	47.88± 2.96* [#]
Control group(n=38)	Before treatment	0.67± 0.11	1.04± 0.10	60.51± 4.22	30.94± 2.18
	After treatment	1.04± 0.16*	1.52± 0.17*	71.87± 4.83*	40.65± 2.83*

Note: * $P < 0.05$ means compared with before treatment, [#] $P < 0.05$ means compared with the control group after treatment.

道(气管插管和气管切开)对患者进行呼吸支持的通气方式,主要机制是给予患者一个较高的呼气压和一个较低的呼气压,以对抗自身的呼吸气压,其中较高的呼气压减少患者机体氧耗量、抑制二氧化碳的生成量、增加通气量,配合较低的呼气压,可以增强患者肺的顺应性,改善患者肺泡的氧合功能、增加通气量^[20-22]。现阶段临床广泛使用的无创呼吸机操作较为简单,使用安全可靠,使用后并发其他肺部感染和损伤的几率大大降低,患儿的接受程度和治疗的依从性较高^[23],相较于传统的有创机械通气疗法,其避免了人工气道的建立,也不需要插管,患者可进行正常的吞咽饮食和湿化,在很大程度上降低了患儿的痛苦,其次间歇性通气,患儿脱机比较容易^[24,25]。

本次研究结果显示,在常规治疗的基础上研究组患儿使用无创呼吸机辅助呼吸治疗后,患儿的临床治疗效果明显升高,其血气指标、pH 值、心率、呼吸频率以及肺功能各项指标水平均得到明显改善,且优于对照组,说明使用无创呼吸机辅助治疗后有效的改善了患儿体内气体交换水平,为呼吸衰竭的患儿提供了良好的呼吸支持,通过改善的血气指标可以得出患儿低氧血症、高碳酸血症等呼吸衰竭的症状得到了明显的改善,同时帮助患儿肺功能得到明显的改善^[26,27]。尤为注意的是在无创辅助呼吸治疗的过程中,护理人员具有十分重要的作用,对于患儿来说,身体各项机能尚未发育完全,机体抵抗力较弱,病情容易反复,在这种条件下,就要求护理人员要熟练掌握呼吸机的操作,具有丰富的专业知识和临床经验,以提高患儿的治疗效果^[28,29]。

综上所述,无创辅助呼吸治疗重症肺炎所致呼吸衰竭,能提高患儿的疗效,改善血气分析、心率、呼吸频率等指标的水平,提高患儿肺功能,具有操作简单、安全性高、效果可靠的优点,可在临床范围内推广使用。

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