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参麦注射液联合无创正压通气治疗慢性阻塞性肺疾病 合并呼吸衰竭的临床观察

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摘要 目的:观察参麦注射液联合无创正压通气治疗慢性阻塞性肺疾病(COPD)合并呼吸衰竭的疗效及其对患者血清脑钠肽(BNP)、纤维蛋白原和D-二聚体水平的影响。**方法:**选取2010年1月至2012年1月我院收治的COPD合并急性呼吸衰竭患者120例,随机分为观察组和对照组,每组各60例,对照组予以常规治疗,观察组在对照组的基础上予以无创正压通气和参麦注射液治疗,观察和比较两组治疗前后的pH值、动脉血氧分压(PaO_2)、动脉血二氧化碳分压(PaCO_2)、氧合指数($\text{PaO}_2/\text{FiO}_2$)、纤维蛋白原、D-二聚体和BNP水平的变化。**结果:**治疗后,两组的pH、 PaO_2 和 $\text{PaO}_2/\text{FiO}_2$ 均较治疗前明显升高($P<0.01$),且观察组 $\text{PaO}_2/\text{FiO}_2$ 水平较对照组升高更为明显($P<0.05$);两组 PaCO_2 、纤维蛋白原、D-二聚体和BNP水平均较治疗前明显降低($P<0.01$),且观察组以上指标水平明显低于对照组($P<0.01$)。**结论:**参麦注射液联合无创正压通气治疗COPD合并呼吸衰竭的疗效显著,并可显著降低患者血浆BNP、纤维蛋白原和D-二聚体水平。

关键词:参麦注射液;慢性阻塞性肺疾病;呼吸衰竭;脑钠肽;纤维蛋白原;D-二聚体

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Clinical Observation on the Efficacy of Shenmai injection combined with Non-invasive Positive Pressure Ventilation in the treatment of Patients with Chronic Obstructive Pulmonary Disease Plus Respiratory Failure

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ABSTRACT Objective: To observe the efficacy of Shenmai injection combined with non-invasive positive pressure ventilation in the treatment of patients with chronic obstructive pulmonary disease (COPD) plus respiratory failure and its effect on the serum levels of brain natriuretic peptide (BNP), fibrinogen and D-dimer. **Methods:** 120 patients with COPD plus acute respiratory failure, admitted from January 2010 to January 2012, were randomly divided into the observation group and control group, 60 cases in each group. The control group was given the conventional treatment, the observation group was treated with Shen Mai injection combined with noninvasive positive pressure ventilation on the basis of control group, the levels of pH, arterial oxygen pressure (PaO_2), arterial partial pressure of carbon dioxide (PaCO_2), oxygenation index ($\text{PaO}_2/\text{FiO}_2$), fibrinogen, D dimer and BNP were observed and compared before and after treatment. **Results:** After treatment, the levels of pH, PaO_2 and $\text{PaO}_2/\text{FiO}_2$ were significantly higher in two groups than those before treatment ($P<0.01$), while the levels of $\text{PaO}_2/\text{FiO}_2$ increased more significantly compared with the control group ($P<0.05$). The levels of PaCO_2 , fibrinogen, D-dimer and BNP were significantly lower than those before treatment ($P<0.01$), while the reduced levels were more obvious in the observation group ($P<0.01$). **Conclusion:** Shenmai injection combined with non-invasive positive pressure ventilation was more effective to the COPD patients with respiratory failure, which obviously increased the serum BNP, fibrinogen and D-dimer levels.

Key words: Shenmai injection; Chronic obstructive pulmonary disease; Respiratory failure; Brain natriuretic peptide; Fibrinogen; D-dimer

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慢性阻塞性肺疾病 (chronic obstructive pulmonary disease, COPD)是一种常见的呼吸系统慢性炎症性疾病,以气道、肺实质、肺血管的慢性炎症为主要特征,其病情呈进行性发展,严重影响着患者的生活质量,呼吸衰竭是 COPD 最常见的并发症之一,治疗不及时或不当均可危及患者的生命^[1]。我院运用参麦注

射液联合无创正压通气治疗 COPD 合并呼吸衰竭的患者取得了良好的疗效,现报告如下。

1 资料与方法

1.1 一般资料

选择2010年1月至2012年1月我院收治的COPD合并急性呼吸衰竭患者120例,其中男性49例,女性71例,平均年龄 $67.37\pm 9.62(45\sim 75)$ 岁,所有患者的诊断均符合COPD和呼吸衰竭的诊断标准^[2,3]。呼吸衰竭的诊断标准:按入院当天患者

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的血气分析结果,动脉血氧分压(PaO_2) $\leq 60\text{mmHg}$,伴有或不伴有动脉二氧化碳分压(PaCO_2) $\geq 50\text{mmHg}$ °,同时 $\text{pH}>7.2$ 。所有的患者排除有心肝肾脑肾功能衰竭;严重心脏病及冠心病;无有效排痰能力的患者;有呼吸机触发异常者。将患者随机分为观察组和对照组,两组各 60 例,均知情同意,两组患者的年龄、性别和血气分析结果等一般资料比较差异无统计学意义($P>0.05$),具有可比性。

1.2 方法

1.2.1 治疗方法 对照组予以正规的抗炎、祛痰、解除支气管痉挛,降低肺动脉高压,适当的皮质激素和呼吸兴奋剂等治疗;观察组在对照组的基础上使用罩双水平气道正压通,呼吸机为美国伟康公司产品,选择合适口鼻面罩,设定参数 S/T 模式预设呼吸频率 12~16 次/min,氧浓度 30~35% 左右,吸气压以 $8\text{cmH}_2\text{O}$ 开始,逐渐增加压力至 $14\sim 20\text{cmH}_2\text{O}$,呼气压力 $4\text{cmH}_2\text{O}$,每日上机 2 次,每次 4 h。同时联合参麦注射液 30mL ,加入 5%葡萄糖注射液 250mL 中静滴,1 次/d,15 d 为 1 疗程,病情好转后逐渐下调呼吸机参数。

1.2.2 标本采集和保存 治疗前和治疗后 15d 抽取患者清晨空腹肘静脉血 3mL ,注入普通塑料管内,1.8 mL 注入含 0.2 mL 3.8%枸橼酸钠的抗凝管内,标本采集后 1 h 内 3000r/min ,离心 10 min,将血清或血浆提取后分别分装于 0.5 mL 的 EP 管内, -30°C 保存,1 个月内检测。

1.2.3 检测方法 采用干化学法对血浆脑钠肽(BNP)进行分析(罗

氏 Cardiac reader 分析仪);纤维蛋白原和 D-二聚体的分析采用采用血凝仪检测(日本 Sysmex-CA6000),试剂均为配套试剂,严格按说明操作。血气分析抽动脉血 1mL (肝素抗凝),由血气分析仪测定。

1.3 观察指标

观察两组治疗前后的 pH 值、动脉血氧分压(PaO_2)、动脉血二氧化碳分压(PaCO_2)、氧合指数($\text{PaO}_2/\text{FiO}_2$)、纤维蛋白原、D 二聚体和 BNP 水平的变化。

1.4 统计学处理

采用 SPSS19.0 软件。计量资料以均数 $\pm$ 标准差($\bar{x}\pm s$)表示,组间比较采用 t 检验,计数资料用率表示,两组间率比较采用 χ^2 检验,以 $P<0.05$ 为差异有统计学意义。

2 结果

2.1 两组治疗前后的血气分析及氧饱和指数比较

如表 1 所示,治疗后,两组的 pH、 PaO_2 和 $\text{PaO}_2/\text{FiO}_2$ 均较治疗前明显升高 ($P<0.01$),而 PaCO_2 水平较治疗前明显降低 ($P<0.01$),且观察组 $\text{PaO}_2/\text{FiO}_2$ 和 PaCO_2 水平与对照组比较差异均有统计学意义($P<0.05$ 或者 <0.01)。

2.2 两组治疗前后的纤维蛋白原、D 二聚体和 BNP 水平的变化

如表 2 所示,治疗后,两组纤维蛋白原、D 二聚体和 BNP 水平较治疗前明显降低 ($P<0.01$),且观察组以上指标均显著低于对照组 ($P<0.01$)。

表 1 两组治疗前后的血气分析及氧饱和指数的比较

Table 1 Comparison of the serum blood gas analysis and oxygen saturation index between two groups before and after treatment

Group	Case	pH		$\text{PaCO}_2(\text{mmHg})$		$\text{PaO}_2(\text{mmHg})$		$\text{PaO}_2/\text{FiO}_2$	
		Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment
Observation group	60	7.33 ± 0.11	$7.41\pm 0.08^{**}$	76.35 ± 10.21	$48.27\pm 8.21^{**}$	50.65 ± 9.35	$86.35\pm 12.34^{**}$	254.32 ± 45.65	$331.54\pm 33.65^{**}$
Control group	60	7.32 ± 0.10	$7.39\pm 0.09^{**}$	75.98 ± 9.61	$52.95\pm 7.68^{**}$	51.19 ± 8.82	$85.89\pm 11.68^{**}$	261.24 ± 47.75	$315.34\pm 41.21^{**}$
t		0.420	1.287	0.204	3.225	0.267	0.209	0.811	2.359
P		0.675	0.201	0.838	0.002	0.790	0.834	0.419	0.020

注:与治疗前比较, $*P<0.05$, $**P<0.01$ 。

Note: Compared with before treatment, $*P<0.05$, $**P<0.01$.

表 2 两组治疗前后的纤维蛋白原、D 二聚体和 BNP 水平的变化

Table 2 Changes of the serum levels of fibrinogen, D-dimer and BNP between two groups before and after treatment

Group	Cases	Fibrinogen(g/L)		D-dimer(mg/L)		BNP(pg/L)	
		Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment
Observation group	60	$2.26\pm 0.26^{**}$	2.19 ± 0.64	$1.13\pm 0.26^{**}$	$1.13\pm 0.26^{**}$	171.65 ± 65.78	$61.35\pm 18.65^{**}$
Control group	60	$2.86\pm 0.28^{**}$	2.17 ± 0.57	$1.49\pm 0.38^{**}$	$1.49\pm 0.38^{**}$	170.25 ± 81.65	$109.56\pm 24.64^{**}$
t		12.163	0.181	6.056	6.056	0.103	12.084
P		0.000	0.857	0.000	0.000	0.918	0.000

注:与治疗前比较, $*P<0.05$; $**P<0.01$ 。

Note: Compared with before treatment, $*P<0.05$, $**P<0.01$.

3 讨论

COPD 是世界范围内严重危害公共健康的常见病与多发病,常并发呼吸衰竭、肺性脑病等多脏器功能不全^[4]。缺氧、高碳酸血症直接或间接经多种炎症介质的作用导致血管内皮、肺泡上皮受损,对机体血管内凝血和纤溶平衡具有破坏作用,导致凝血系统激活,使机体处于高凝状态,加重肺动脉高压,最终导致肺小动脉血栓形成,加重右心衰,进而加重呼吸衰竭的加重^[5]。D-二聚体为交联纤维蛋白的产物,为纤溶过程的标记物,其定量检测有助于了解活动性纤溶的情况,但含量增高时,提示体内血栓形成的可能,对于血栓性疾病的早期诊断具有重要的价值^[6]。纤维蛋白原是由肝脏合成,是一种应激性蛋白,其增高往往是非特异性的,参与凝血过程,具有使红细胞聚集性增强和血液粘滞性增高的作用^[7-9]。本组研究表明参麦注射液联合无创正压通气治疗 COPD 合并呼吸衰竭的疗效显著,治疗后两组的 pH、PaO₂ 和 PaO₂/FiO₂ 较治疗前明显升高,且 PaO₂/FiO₂ 水平较对照组升高更为明显;PaCO₂、纤维蛋白原和 D-二聚体水平较治疗前均明显降低,且显著低于对照组。参麦注射液联合无创正压通气可能使患者膈肌的顺应性增加,明显改善膈肌的舒张功能^[10],降低膈肌的疲劳,可以改善机体的血液粘度,降低肺动脉的压力,使血液与氧气充分氧合,进而促进疾病的快速恢复。

BNP 是一种内分泌激素,可利尿,扩张血管,抑制交感神经的活性,对肾素-血管紧张素-醛固酮系统(RAAS)具有明显的拮抗作用,其主要的生物效应为调节血容量,减轻容量负荷,与多种脏器功能有密切的联系^[11,12]。本组研究表明治疗后两组的 BNP 水平较治疗前明显降低,而观察组的降低水平更为明显,提示参麦注射液联合无创正压通气治疗 COPD 合并呼吸衰竭更有利于患者的恢复。可能与下列因素有关:参麦注射液联合无创正压通气可改善患者的低氧血症^[13],直接去除了因低氧而导致的 BNP 的释放^[14];正压通气使胸腔内压力增高,静脉回心血量减少,心室负荷和心室张力降低,直接抑制 BNP 的合成及分泌^[15];缺氧纠正后,参麦注射液具有降低血液粘度,改善血液流变学,使肺毛细血管充分的血液循环,使肺循环阻力的阻力明显降低下降,减少 BNP 的分泌。

总之,参麦注射液联合无创正压通气治疗 COPD 合并呼吸衰竭的疗效显著,其机理可能与提高机体的血氧饱和度,并显著降低患者血浆 BNP、纤维蛋白原和 D-二聚体水平密切相关。

参考文献(References)

- [1] Nilius G, Franke K J, Domanski U, et al. Effects of nasal insufflation on arterial gas exchange and breathing pattern in patients with chronic obstructive pulmonary disease and hypercapnic respiratory failure [J]. Adv Exp Med Biol, 2013, 755:27-34
- [2] Jordan R E, Miller M R, Lam K B, et al. Sex, susceptibility to smoking and chronic obstructive pulmonary disease: the effect of different diagnostic criteria. Analysis of the Health Survey for England [J]. Thorax, 2012, 67(7):600-605
- [3] Menzella F, Facciolo N, Lusuadi M, et al. Clinical Audit on Diagnostic Accuracy and Management of Respiratory Failure in COPD [J]. Respir Care, 2012, 57(12):2067-2073
- [4] Lima O M, Oliveira-Souza R, Santos O R, et al. Subclinical encephalopathy in chronic obstructive pulmonary disease[J]. Arq Neuropsiquiatr, 2007, 65(4B):1154-1157
- [5] Carrillo A, Ferrer M, Gonzalez-Diaz G, et al. Noninvasive ventilation in acute hypercapnic respiratory failure caused by obesity hypoventilation syndrome and chronic obstructive pulmonary disease[J]. Am J Respir Crit Care Med, 2012, 186(12):1279-1285
- [6] Hartmann I J, Hagen P J, Melissant C F, et al. Diagnosing acute pulmonary embolism: effect of chronic obstructive pulmonary disease on the performance of D-dimer testing, ventilation/perfusion scintigraphy, spiral computed tomographic angiography, and conventional angiography. ANTELOPE Study Group. Advances in New Technologies Evaluating the Localization of Pulmonary Embolism[J]. Am J Respir Crit Care Med, 2000, 162(6):2232-2237
- [7] Thomsen M, Dahl M, Lange P, et al. Inflammatory biomarkers and comorbidities in chronic obstructive pulmonary disease[J]. Am J Respir Crit Care Med, 2012, 186(10):982-988
- [8] Lazovic B. Correlation of CRP and serum level of fibrinogen with severity of disease in chronic obstructive pulmonary disease patients[J]. Med Arh, 2012, 66(3):159-160
- [9] Valvi D, Mannino D M, Mullerova H, et al. Fibrinogen, chronic obstructive pulmonary disease (COPD) and outcomes in two United States cohorts[J]. Int J Chron Obstruct Pulmon Dis, 2012, 7:173-182
- [10] 高丽,王瑞萍.参麦、氨溴索对慢性阻塞性肺疾病急性加重期治疗作用[J].内蒙古中医药,2010,29(7):16-17
- [11] Gao Li, Wang Rui-ping. Therapeutic effect of Shenmai combined with ambroxol in acute aggravated chronic obstructive pulmonary disease [J]. Inner Mongolia Journal of Traditional Chinese Medicine, 2010, 29 (7):16-17
- [12] Zhang J, Zhao G, Yu X, et al. Intravenous diuretic and vasodilator therapy reduce plasma brain natriuretic peptide levels in acute exacerbation of chronic obstructive pulmonary disease [J]. Respiriology, 2012, 17(4):715-720
- [13] Chi S Y, Kim E Y, Ban H J, et al. Plasma N-terminal pro-brain natriuretic peptide: a prognostic marker in patients with chronic obstructive pulmonary disease[J]. Lung, 2012, 190(3):271-276
- [14] Rizkallah J, Sin D D. Effecting positive outcomes through positive pressure ventilation in COPD[J]. Respiriology, 2010, 15(7):1019-1020
- [15] Gariani K, Delabays A, Perneger T V, et al. Use of brain natriuretic peptide to detect previously unknown left ventricular dysfunction in patients with acute exacerbation of chronic obstructive pulmonary disease[J]. Swiss Med Wkly, 2011, 141:w13298
- [16] Prosen G, Klemen P, Strnad M, et al. Combination of lung ultrasound (a comet-tail sign) and N-terminal pro-brain natriuretic peptide in differentiating acute heart failure from chronic obstructive pulmonary disease and asthma as cause of acute dyspnea in prehospital emergency setting[J]. Crit Care, 2011, 15(2):R114