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85 例重症支原体肺炎患儿肺功能动态观察及临床意义 *

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摘要 目的:分析 85 例小儿重症支原体肺炎(Mycoplasma pneumoniae pneumonia, MPP)肺功能指标动态变化情况,为临床上重症 MPP 的诊断和预后评估提供有效参考。**方法:**回顾性选取我院儿科接诊的重症 MPP 患儿 85 例为重症组,并选取基线资料差异不显著的轻症 MPP 患儿 72 例(轻症组)为研究对象。全部 MPP 患儿均行大环内酯类抗感染治疗,联合头孢曲松抗菌治疗,并予氨溴索祛痰等对症支持治疗,比较重症组与轻症组发病急性期与恢复期肺功能指标的变化。**结果:**①重症组在急性期大气道通气指标 FVC、PEF、FEV1、FEV1/FVC 表达量均显著低于轻症组($P<0.05$);重症组 FVC、PEF、FEV1、FEV1/FVC 在恢复期和轻症组无显著差异($P>0.05$);②重症组小气道通气指标 FEF25、FEF50、FEF75、FEF25-75 在各个时间节点均与轻症组有显著差异($P<0.05$)。**结论:**儿童重症 MPP 具有发病急性期大、小气道受损严重的特点,大气道在恢复期各项指标均接近正常,而小气道在恢复期各项指标仍处于异常表达的状态。肺功能指标的动态监测对重症 MPP 有一定临床意义。

关键词:重症支原体肺炎;肺功能;动态观察

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Dynamic Observation and Clinical Significance of Pulmonary Function in 85 Cases with Severe Mycoplasma Pneumoniae Pneumonia*

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ABSTRACT Objective: To analyze the dynamic changes of pulmonary function in 85 cases with mycoplasma pneumoniae pneumonia (MPP), and provide effective reference for the diagnosis and prognosis of severe MPP. **Methods:** 85 children with severe MPP who were treated in our hospital were retrospectively chosen as severe group. 72 patients with mild MPP with insignificant differences in baseline data were selected as mild group. All MPP patients received anti-inflammatory therapy with Macrolides, anti-biotic therapy with ceftriaxone and symptomatic and supportive treatment with ambroxol. The pulmonary function changes of two groups in acute and recovery stages were compared. **Results:** ① The expression levels of major airway ventilation indicators FVC, PEF, FEV1, FEV1 / FVC during acute stage in severe group were significantly lower than those in the mild group ($P<0.05$). There was no significant difference in small airway ventilation indicators FVC, PEF, FEV1, FEV1 / FVC during recovery stage between two groups ($P>0.05$). ② The FEF25, FEF50, FEF75 and FEF25-75 levels in the severe group were significantly different from those in the mild group at all time points ($P<0.05$). **Conclusion:** Severe MPP in children is characterized by serious damage of major and small airways during acute stage. Ventilation indicators of major airway turn approximately normal during recovery stage, while those of small airway still remain abnormal during this period. Dynamic monitoring of pulmonary function indicators has some clinical significance to severe MPP.

Key words: Severe mycoplasma pneumonia; Pulmonary function; Dynamic observation

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前言

MPP 为发病率较高的儿童社区获得性肺炎,占全部儿童肺炎的 20%~30%左右,且呈现逐年递增趋势。多数 MPP 患儿起病缓慢、肺部体征不明显,且轻症 MPP 病情较轻,预后较好,但如果治疗不及时,患儿病情可能恶化成重症 MPP,同时病情迁延不愈还会诱发肺外多系统受累,严重影响患儿生长发育,甚至造成生命威胁。因此,找到一种能够早期诊断 MPP 病情且

可以作为预后评估标准的检测指标为医学界共同探讨的重要课题^[1-5]。大量文献报道^[6-9],肺功能检查在呼吸道病变的鉴别诊断、预后评估、病情分级等方面均具有良好效果,但关于肺功能动态检测对儿童重症 MPP 的病情评估仍欠缺理论依据。基于此,本研究回顾我院资料,选取轻症、重症 MPP 患儿进行对比,旨在找到肺功能指标变化与重症 MPP 的关系。

1 资料与方法

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1.1 一般资料

回顾性选取我院儿科 2014 年 1 月至 2015 年 10 月收治的 85 例小儿重症 MPP 病例列为重症组,另选取 72 例小儿轻症 MPP 病例归为轻症组。纳入标准^[10-12]:① 入选患儿均达到支原体肺炎的诊断依据:有咳嗽、肺部湿啰音等典型临床症状并经胸部 X 线摄片扫描,证实肺部存在间质性病变,确诊为轻症或重症 MPP;② 白细胞计数介于 $4 \times 10^9/L$ 和 $10 \times 10^9/L$ 之间;③ 患儿及其监护人对本研究知情同意,临床资料完善,能够配合完成研究。排除标准^[13,14]:① 合并感染性、代谢性或凝血障碍等疾病者;② 合并呼吸道其他疾病者;③ 呼吸系统发育畸形者。重症组患儿男女童比 46:39,均龄 (8.15 ± 1.56) 岁;轻症组男女童比 38:34,均龄 (7.85 ± 1.24) 岁,两组一般资料无显著差异($P > 0.05$)。

1.2 治疗方法

两组患儿均接受大环内酯类药物的治疗干预,治疗周期均以 7 d 为一疗程,7d 后病情未治愈者,接受第二疗程治疗。

1.3 检测方法

全部入选者的动态肺通气功能检测均在肺功能仪下检测,采用德国 CareFusion Germany 公司肺功能仪,产品型号为 MasterScreen。本试验操作方法:被测试小儿放松,坐直,头保持正直,下颌自然水平或稍微上仰,用鼻夹夹紧鼻翼或用手捏紧患儿鼻子,嘱患儿用牙齿轻轻咬住咬嘴,并嘴唇严密包紧咬嘴,口角不能漏气,咬嘴不能堵塞,嘱患儿尽可能深吸、快吸、吸足,立即用最大爆发力呼气,注意用力呼气过程无中断,无咳嗽,并且主动发力,尽可能完全呼气至极限。

1.4 观察指标

观察两组急性期与恢复期(治疗 10 d 后)的肺功能大气道通气功能的指标 FVC(Forced vital capacity,用力肺活量)、PEF(Peak expiratory flow rate,呼气流量峰值)、FEV1(forced expiratory volume in one second,一秒钟用力呼气量)、小气道通气功能标 FEF25(forced expiratory flow after 25% of vital capacity has been expelled, 排出 25%肺活量后用力呼气量)、FEF50(forced expiratory flow after 50% of vital capacity has been expelled, 排出 50%肺活量后用力呼气量)、FEF75 (forced expiratory flow after 75% of vital capacity has been expelled, 排出 75%肺活量后用力呼气量)、FEF25-75 (forced expiratory flow after 25%-75% of vital capacity has been expelled, 排出 25%-75%肺活量后用力呼气量)和 FEV1/FVC 指标的变化。

1.5 统计学方法

实验数据分析程序为 SPSS.19.0 软件,组间不同时间重复测量以重复测量方差分析,计数结果对比取 χ^2 检验,计量结果表达式为(均数 $\pm$ 标准差),组内比较取成组 t 检验,组外比较取 LSD-t 检验, $P < 0.05$,为差异显著。

2 结果

2.1 两组大气道通气功能指标比较

重症组在急性期各项指标均显著低于轻症组(P 均 < 0.05),重症组 FVC、PEF、FEV1 于恢复期显著回升,但 FEV1/FVC 仍低于轻症组(P 均 < 0.05),见表 1。

表 1 组间大气道通气功能指标的比较

Table 1 Comparison of major airway ventilation indicators between two groups

Groups		FVC (L)	PEF (L/s)	FEV1 (L)	FEV1/FVC(L/s)
Severe group(n=85)	Acute stage	1.13 $\pm$ 0.39 ^a	1.71 $\pm$ 0.41 ^a	0.93 $\pm$ 0.36 ^a	0.82 $\pm$ 0.45 ^a
	Recovery stage	2.11 $\pm$ 0.71	3.17 $\pm$ 0.43	1.69 $\pm$ 0.38	0.80 $\pm$ 0.47 ^a
	F	12.452	13.512	11.654	1.508
	P	< 0.05	< 0.05	< 0.05	> 0.05
Mild group(n=72)	Acute stage	2.01 $\pm$ 0.34	3.14 $\pm$ 0.62	1.81 $\pm$ 0.42	0.90 $\pm$ 0.37
	Recovery stage	2.16 $\pm$ 0.26	3.41 $\pm$ 0.38	2.07 $\pm$ 0.49	1.00 $\pm$ 0.34
	F	1.465	1.831	1.783	2.912
	P	> 0.05	> 0.05	> 0.05	> 0.05

Note: compared with mild group at the same time, ^a $P < 0.05$.

2.2 两组小气道通气功能标的比较

重症组在不同观察节点 FEF25、FEF50、FEF75、FEF25-75 均有显著改变(P 均 < 0.05),重症组各项指标较轻症组在不同时间点均有显著改变(P 均 < 0.05),见表 2。

3 讨论

重症 MPP 具有骤然发病、病程迁延的特点,主要临床表现为日轻夜重的痉挛性咳嗽、胸闷头晕、多数患者呼吸系统内有黏性分泌物,部分患者可产生咯血或肺外脏器受累等症状。如治疗不及时,可威胁患者生命,因而及时诊断尤为必要。肺通气

功能检测为呼吸系统疾病常用检查方式之一,是检测气体进入肺泡组织和从肺泡组织中排除气体的动态过程,可在一定程度上起到鉴别诊断疾病、分析病情功能障碍和严重程度,判断肺部干预前后疗效的作用^[15-17]。常用的检测指标分大、小气道通气指标两种,主要为 FVC、PEF、FEV1、FEV1/FVC 以及 FEF25、FEF50、FEF75、FEF25-75。有报道发现^[18-20],大、小气道通气指标用于诊断慢性阻塞性肺病具有可明确判断病情种类、病情程度的优点,但用于 MPP 诊断、尤其是 MPP 病情程度分级的相关文献仍较为少见,本研究探讨对重症 MPP 患儿实施肺通气功能检查的动态效果。

表 2 两组小气道通气功能指标比较
Table 2 Comparison of small airway ventilation indicators between two groups

Groups		FEF ₂₅ (L/s)	FEF ₅₀ (L/s)	FEF ₇₅ (L/s)	FEF25-75 (L/s)
Severe group(n=85)	Acute stage	1.67± 0.43 ^a	1.09± 0.41 ^a	0.58± 0.38 ^a	0.73± 0.38 ^a
	Recovery stage	2.65± 0.49 ^a	1.78± 0.46 ^a	0.71± 0.41 ^a	0.68± 0.42 ^a
	F	12.454	13.106	12.878	13.121
	P	<0.05	<0.05	<0.05	<0.05
Mild group(n=72)	Acute stage	2.87± 0.43	1.46± 0.45	0.68± 0.31	0.65± 0.49
	Recovery stage	3.15± 0.49	2.28± 0.35	1.04± 0.42	0.99± 0.58
	F	10.451	10.536	11.180	10.792
	P	<0.05	<0.05	<0.05	<0.05

Note: compared with mild group at the same time, ^aP<0.05.

研究发现,重症组儿童在急性期 FVC、PEF、FEV1、FEV1/FVC 显著低于轻症组(P 均<0.05),重症组在恢复期 FVC、PEF、FEV1、FEV1/FVC 表达与轻症组差异不显著(P 均>0.05),这说明在恢复期后,重症组患儿大气道通气功能指数均显著上升,患儿大气道病情得以康复。而轻症组相关指标无显著异常,较为接近正常值,说明轻症组患儿的大气道功能没有得到明显损伤,其病情可能为小气道受损。重症组小气道通气指标 FEF25、FEF50、FEF75、FEF25-75 在各个观察节点均与轻症组差异显著(P 均<0.05),说明重症组小气道受损程度严重,且在恢复期仍存在尚未痊愈的情况。观察其组间 FEF25、FEF50、FEF75、FEF25-75 表达量变化,可见重症组儿童小气道通气功能指标呈逐渐好转趋势,这可能需要更长时间的治疗才能康复,进一步研究需加大观察周期。轻症组在急性期与干预 1 个月后和干预 3 个月及 1 年相比小气道通气功能各项指标均有显著变化(P 均<0.05),且干预 3 个月后各项指标基本正常,说明经过 3 个月的治疗,轻症组患儿小气道损伤得以修复,患儿病情基本痊愈。

综上所述,小儿重症 MPP 可侵害患儿大、小气道,使患儿急性期大、小气道通气指标异常下降,虽然大气道指标在恢复期见显著好转,但小气道肺功能指标显著低于轻症组表达量。动态监测肺功能对患儿 MPP 诊断有良好意义。

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