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住院儿童肺炎发病情况及病毒病原学分析*

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摘要 目的:统计我院 1-7 岁住院儿童肺炎发病情况进行病毒病原学分析。**方法:**收集 2015 年 1 月到 2017 年 12 月河北省人民医院 1-7 岁住院儿童 8532 例的临床资料,统计不同年龄段的肺炎患儿、重症肺炎患儿的发病情况及不同季节肺炎分布特点,统计不同病毒病原体住院肺炎儿童入院时的症状或体征情况,记录住院肺炎儿童并发症发生情况。**结果:**8532 例住院儿童中,肺炎患儿 2476 例。1 岁患肺炎、重症肺炎的发病率均最高,分别为 54.67%(703/1286)、1.14%(8/703);7 岁患肺炎发病率最低,为 12.52%(126/1006);6 岁和 7 岁重症肺炎发病率均为 0.00%。冬季肺炎发病率最高,为 33.38%(724/2169),春季、夏季、秋季发病率相当。病毒病原学显示,至少 1 种病毒检测阳性的有 2061 例,阳性率为 83.24%。腺病毒和偏肺病毒阳性患儿出现发热、呼吸急促和呼吸困难的比例高于其他病毒感染;各种病毒阳性病例中,咳嗽、咳痰、流涕等呼吸道症状出现的频率相当。住院肺炎患儿中出现并发症以呼吸衰竭为主,占比为 21.16%,其次是心力衰竭,占比为 14.82%,脓毒血症的发生率为 8.72%,其他并发症发生率均较低。**结论:**2015-2017 年我院 1-7 岁住院儿童肺炎和重症肺炎的发生率以 1 岁最高,且随着年龄的增长发病率呈下降趋势,冬季最多见,病毒病原体中以腺病毒和偏肺病毒感染导致的发热、呼吸急促和呼吸困难症状较多,并发症以呼吸衰竭为主。

关键词:住院儿童;肺炎;季节;病毒病原学;发病情况

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Incidence and Viral Pathogenic Analysis of Pneumonia in Hospitalized Children*

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ABSTRACT Objective: To statistics the incidence of pneumonia among hospitalized children aged 1-7 years in our hospital and analyze the viral pathogens. **Methods:** The clinical data of 8532 hospitalized children aged 1-7 years in Hebei Provincial People's Hospital from January 2015 to December 2017 were collected. The incidence of pneumonia and severe pneumonia in children of different age groups and the distribution characteristics of pneumonia in different seasons were analyzed. The symptoms and signs of hospitalized children with pneumonia caused by different viral pathogens were analyzed. The incidence of complications in hospitalized children with pneumonia were recorded. **Results:** Of the 8532 hospitalized children, 2476 children with pneumonia. The incidence of pneumonia and severe pneumonia in 1-year-old children were the highest, they were 54.67% (703/1286) and 1.14% (8/703) respectively. The incidence of pneumonia in 7-year-old children was the lowest, it was 12.52% (126/1006). The incidence of severe pneumonia at the age of 6 and 7 were 0.00%. The highest incidence of pneumonia in winter was 33.38% (724/2169). The incidence were similar in spring, summer and autumn. Virus etiology showed that at least one virus was positive in 2061 cases, and the positive rate was 83.24%. The proportion of fever, shortness of breath and dyspnea in adenovirus and metapneumovirus positive children were higher than that in other viruses. Among all kinds of various viral positive cases, the frequency of respiratory symptoms such as cough, expectoration and runny nose were similar. Respiratory failure was the main complication in hospitalized children, the ratio was 21.16%. Followed by heart failure, the ratio was 14.82%. The incidence of sepsis was 8.72%, the incidence of other complications were low. **Conclusion:** The incidence of pneumonia and severe pneumonia in hospitalized children aged 1-7 years in our hospital from 2015 to 2017 is the most common in 1 year old, and the incidence rate decreases with age, the most common in winter. Fever, shortness of breath and dyspnea caused by adenovirus and metapneumovirus infection are the most common viral pathogens, the respiratory failure is the main complication.

Key words: Hospitalized children; Pneumonia; Season; Viral pathogens; Incidence

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前言

肺炎是临床常见的呼吸系统疾病,是一种主要发生在肺间质、肺泡及终末气道的炎性疾病,在临床上具有较高的发生率,婴幼儿为该病的高发人群,对患儿的身体健康造成严重影响,甚至对生命造成威胁^[1-3]。据临床数据显示,每年约有 3-5 万儿童因肺炎病死,且 1-7 岁患儿占有较大比例,其中以婴幼儿居多^[4,5]。儿童肺炎具有病情复杂、病原菌种类多、病原菌致病力强的特点,临床治疗难度较大^[6],其中,重症肺炎是以肺部感染为主要表现的一组复杂综合征状态,目前儿童肺炎中相当一部分比例为重症肺炎^[7]。除了常见的导致肺炎发生的细菌以外,病毒感染常是导致肺炎的重要原因,且患儿因年幼体质较弱,机体免疫力较低,容易受到病毒的侵袭^[8,9]。同时,不同年龄、不同季节、不同地域的肺炎患儿在病毒病原学上表现出其自身的特殊性,不同病原学导致的肺炎在表现上也不尽相同^[10],因此本研究主要是对儿童肺炎的病原学特点进行分析,旨在为临床提供参考。

1 对象与方法

1.1 研究对象

收集 2015 年 1 月到 2017 年 12 月河北省人民医院 1-7 岁住院儿童 8532 例的临床资料,其中符合肺炎患儿 2476 例,男性 1298 例,女性 1178 例,年龄 1-7 岁,平均 (3.97 ± 1.26) 岁。纳入标准:(1)患儿至少出现一项或一项以上的发热、白细胞计数异常或寒战、呕吐等急性感染的症状或体征;(2)患者至少出现一项或一项以上的咽干咽痛、鼻塞流涕、咳嗽咳痰、喘息气短,或肺部听诊可闻及干湿性啰音、咽部充血水肿或咽后壁淋巴滤泡增多等呼吸道症状;(3)行胸部 X 线检查示肺部炎症性改变;(4)所有患儿均资料完整,均由医院信息库获得资料。排除标准:(1)年龄不足 28 天的新生儿;(2)患儿家长拒绝配合完成

相关病毒病原学检查者。患儿监护人均签署知情同意书。

1.2 诊断标准^[11]

肺炎诊断标准:(1)体温 $\geq 38^{\circ}\text{C}$,咳嗽;(2)伴有呼吸急促;(3)听诊可闻及支气管呼吸音或肺部湿罗音;(4)存在异常呼吸。满足第(1)、(2)条标准,且合并(3)、(4)中的任何一项即可以诊断为肺炎。重症肺炎诊断标准:(1)腋下体温 $\geq 38.5^{\circ}\text{C}$,呼吸频率 ≥ 70 次/min,胸壁伴有吸气性凹陷,鼻翼煽动、口唇紫绀,拒绝饮食,呼吸伴呻吟,且存在间歇性的呼吸停止;(2)患儿的腋下体温超过 38.5°C ,呼吸急促,呼吸频率超过 50 次/min,伴有鼻翼煽动、口唇紫绀。

1.3 方法

搜集患儿的临床资料,根据临床资料对不同年龄段患儿重症肺炎、肺炎的发生情况及不同季节肺炎分布特点进行统计。病毒病原学检测:利用鼻/咽拭子、痰液、鼻咽抽吸物或支气管肺泡灌洗液等途径采集肺炎患儿的呼吸道标本,标本保存于 $4-8^{\circ}\text{C}$ 条件下送检。利用 RT-PCR 技术检测标本中的病毒,包括流感病毒、副流感病毒、冠状病毒、呼吸道合胞病毒(Respiratory syncytial virus, RSV)、偏肺病毒、博卡病毒、腺病毒,RT-PCR 流程严格按照试剂盒统一操作步骤操作。统计不同病毒病原体住院肺炎儿童病例入院时症状或体征情况,记录住院肺炎儿童并发症发生情况。

2 结果

2.1 不同年龄段肺炎、重症肺炎发病情况

肺炎在 1 岁患儿中的发病率最高,为 54.67%(703/1286),7 岁肺炎患儿发病率最低,为 12.52%(126/1006),随着年龄的增长肺炎发病率呈下降趋势;2476 例肺炎患儿中,1 岁患儿重症肺炎发病率最高,为 1.14%(8/703),6 岁和 7 岁重症肺炎发病率均为 0.00%。见表 1。

表 1 不同年龄段儿童肺炎、重症肺炎发病情况[n(%)]

Table 1 Incidence of pneumonia and severe pneumonia in children of different ages[n(%)]

Ages	Total	Incidence of pneumonia	Incidence of severe pneumonia
1-year-old	1286	703(54.67)	8(1.14)
2-year-old	1425	447(31.37)	2(0.45)
3-year-old	1194	344(28.81)	1(0.29)
4-year-old	1202	323(26.87)	1(0.31)
5-year-old	1218	289(23.73)	1(0.35)
6-year-old	1201	244(20.32)	0(0.00)
7-year-old	1006	126(12.52)	0(0.00)

2.2 不同季节肺炎分布特点

由表 2 可知,冬季肺炎发病率最高,为 33.38%(724/2169),春季、夏季以及秋季发病率相当。

2.3 不同病毒病原体住院肺炎儿童病例入院时症状或体征情况

在 2476 例肺炎患儿中,至少 1 种病毒检测阳性的有 2061 例,阳性率为 83.24%;腺病毒和偏肺病毒阳性患儿出现发热、呼吸急促和呼吸困难的比例高于其他病毒感染;各种病毒阳性

病例中,咳嗽、咳痰、流涕等呼吸道症状出现的频率相当。见表 3。

2.4 住院肺炎儿童并发症发生情况

住院肺炎患儿中,出现并发症以呼吸衰竭为主,占比为 21.16%,其次是心力衰竭,占比为 14.82%,脓毒血症的发生率为 8.72%,其他并发症如胸腔积液、中毒性脑病及酸碱电解质紊乱、气胸、心肌损害、脓胸、急性呼吸窘迫综合征、多器官衰竭等发生率均较低。见表 4。

表 2 不同季节肺炎分布特点

Table 2 Distribution characteristics of pneumonia in different seasons

Seasons	Total	n	Ratio(%)
Spring	2147	579	26.97
Summer	2086	577	27.66
Autumn	2130	596	27.98
Winter	2169	724	33.38

表 3 不同病毒病原体住院肺炎儿童病例入院时症状或体征情况[n(%)]

Table 3 Symptoms or signs of hospitalized children with pneumonia caused by different viral pathogens[n(%)]

Symptoms or signs	RSV(n=746)	Influenza virus (n=341)	Parainfluenza virus (n=397)	Bocavirus (n=187)	Adenovirus (n=147)	Metapneu- movirus(n=169)	Coronavirus (n=74)
Temperature $\geq$ 38.0℃	201(26.94)	83(24.34)	99(24.94)	39(20.86)	93(63.27)	79(46.75)	20(27.03)
Cough	612(82.04)	281(82.40)	321(80.86)	147(78.61)	116(78.91)	130(76.92)	60(81.08)
Runny nose	154(20.64)	62(18.18)	93(23.42)	43(22.99)	31(21.09)	36(21.30)	16(21.62)
Expectoration	396(53.08)	171(50.15)	189(47.61)	105(56.15)	73(49.66)	89(52.66)	41(55.40)
Shortness of breath	43(5.76)	21(6.16)	28(7.05)	21(11.23)	31(21.09)	29(17.16)	3(4.05)
Dyspnea	106(14.21)	36(10.56)	36(9.07)	27(14.44)	35(23.81)	38(22.49)	10(13.51)

表 4 住院肺炎儿童并发症发生情况

Table 4 Incidence of complications in hospitalized children with pneumonia

Complications	Number of cases	Incidence rate(%)
Respiratory failure	524	21.16
Heart failure	367	14.82
Sepsis	216	8.72
Pleural effusion	22	0.89
Toxic encephalopathy	9	0.36
Acid-base and electrolyte disturbance	8	0.32
Pneumothorax	4	0.16
Myocardial damage	12	0.48
Empyema	1	0.04
Acute respiratory distress syndrome	1	0.04
Multiple organ failure	1	0.04

进行全面分析,进而为临床治疗提供依据。

本研究发现,随着年龄的增加肺炎的发病率呈下降趋势,分析其原因可能为随着年龄的增加,儿童的抵抗能力增加,机体各个系统趋于完善,致病菌感染导致肺炎的可能性显著降低^[17,18]。本研究还发现,冬季发病率最高为 33.38%,春季、夏季以及秋季发病率相当,说明冬季是肺炎的高发季节,应该引起充分重视,可能是冬季天气偏凉,且气温有一定变化,较容易引起儿童感染发病^[19,20]。重症肺炎是肺炎比较严重时期,病情变化比较迅速,并发症也非常多,严重威胁患儿的生命^[21,22],本研究显示,重症肺炎在 1 岁患儿中的发病率最高,为 1.14%,6 岁和 7 岁重症肺炎发病率均为 0.00%,提示在治疗过程中应充分重视年龄过小患儿病情变化,预防重症肺炎的发生,进而降低不良事件的发生。儿童肺炎致病病毒具有多样性的特点,随着抗病毒药物的应用病毒种类也存在较大变化^[23,24]。本研究显示,在所选取的患儿中,各种病毒检出率高达 83.24%,提示病毒感染是小儿肺炎发生的重要原因。在病毒的具体分类中,腺病毒和偏肺病毒阳性时出现发热的患者比例显著高于其他病毒感染,这就提示以腺病毒和偏肺病毒感染后易出现发热,考虑原因与两种病毒感染易导致脑内体温调节中枢发生异常,引起体温升高^[25-27]。同时研究发现,在各种病毒导致的阳性病例中,咳嗽、咳痰、流涕等呼吸道症状出现的频率相当,而偏肺病毒和腺病毒阳性病例出现呼吸急促和呼吸困难的频率较高,考虑与患儿体质较弱,而偏肺病毒和腺病毒感染以侵袭呼吸道为主,引起呼吸道痉挛,导致出现呼吸急促和气短等不适症状,可为偏肺病毒和腺病毒感染的肺炎儿童的诊断和针对性治疗提供参考。在因肺炎住院的患儿中,约 21.16%会出现不同程度的呼吸衰竭,心力衰竭,脓毒血症的发生率也较高,考虑与患者体质相对于病毒的感染力来说较弱,感染病毒后容易出现较为严重的并发症,同时也提示偏肺病毒和腺病毒致病易导致呼吸衰竭和心力衰竭^[28-30]。但本研究未显示出现如脓胸、急性呼吸窘迫综合症及多器官功

3 讨论

肺炎是一种常见疾病,且以儿童多见,据统计,肺炎是导致我国 7 岁以下儿童死亡的重要原因,给患儿的生命健康带来较大危害^[12,13]。许多研究显示^[14-16],儿童肺炎具有复杂多变的特点,致病菌也相对较多,且大多数致病菌对抗生素有耐药性,严重影响治疗效果,给临床诊断、治疗以及预后带来较大的影响。但是整个社会对儿童肺炎的重视程度较低,也较容易被忽视。本研究对 2015 年到 2017 年期间我院住院肺炎患儿资料进行分析,对不同年龄段、不同季节肺炎发生情况及病毒病原学情况

能衰竭等严重并发症。本研究尚存在一定局限性,如本研究只观察了导致患儿肺炎的病毒病原体,而对于引起儿童的细菌及其他病原微生物致病情况及特征则未做研究,将在后续的研究进一步探讨。

综上所述,肺炎是我国儿童的常见疾病,对患儿具有较大的危害。2015-2017年我院1-7岁住院儿童肺炎和重症肺炎的发生率以1岁最高,且随着年龄的增长发病率呈下降趋势,冬季最多见,病毒病原体中以腺病毒和偏肺病毒感染导致的发热、呼吸急促和呼吸困难症状较多,且多伴有呼吸衰竭、心力衰竭等并发症。

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