



Research Article

Compliance of the Physicians with the Guidelines for the Management of Community-Acquired Pneumonia in Childhood

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Abstract

Objective

This study was performed to evaluate the impact of adherence to national guidelines for management of community-acquired pneumonia (CAP) in different groups of doctors.

Methods

In this study, a questionnaire was filled interview with a total of 322 with physicians working in hospitals, in different cities of Turkey. The recommendations of the national guideline were compared with the responses.

Results

The physicians, only 11.8% made the diagnosis of pneumonia only with symptoms and physical examinations findings. Averagely, 60% used the investigations of chest x-ray, complete blood count and CRP together for diagnosis. 55% of the doctors preferred par-enteral treatment with the first choice ampicillin/sulbactam in outpatient treatment.

Conclusion

As a result of this study, it was observed that the physicians did not comply with the national guidelines in terms of diagnosis and treatment of CAP in childhood.

Keywords

Childhood; Community-acquired pneumonia; National pneumonia guideline

Introduction

Community-acquired pneumonia (CAP) remains a major cause of morbidity and mortality worldwide in developing and developed countries, and its incidence is highest among children less than 5-y-old. It is estimated that each year 11 to 20 million children are hospitalized due to pneumonia and more than 2 million lose their lives [1,2]. According to the Ministry of Health

data in 1998, pneumonia is responsible for 48.4% of infant deaths under one year of age and 42.1% of child deaths between 1 to 4 years of age in our country [3]. Also, according to Turkey's Burden of Disease Study conducted by the Ministry of Health between the years of 2002-2004, respiratory tract infections are the second most common cause of death in the age group of 0-4 years (13.4%) and in the age group of 5-14 years (6.5%) [4]. CAP is a pneumonia which occurs a person, who is healthy otherwise and who lacks hospitalization history up to fourteen days before the onset of complaints, in daily life within the community [5]. The CAP seen in the childhood group constitutes 37% of total CAPs [6,7]. Diagnosis and treatment guidelines for CAP in childhood are prepared with the aim of decreasing the morbidity and mortality due to pneumonia, using the appropriate methods of diagnosis, selecting the correct antibiotic treatment, providing early diagnosis and effective treatment. In this study, we aimed to investigate the compliance of specialists and residents of Pediatrics and Family Medicine with the consensus guideline on the diagnosis and treatment of CAP in children published in 2009 by examining their approaches of diagnosis, investigation and treatment for CAP in childhood except for the very severe hospitalized cases of pneumonia in intensive care units.

Materials and Methods

For this study, a questionnaire was filled by making face to face interviews with a total of 322 physicians working in university hospitals, education and research hospitals and family health centers in different provinces of Turkey in 2015. Apart from very severe and complicated CAP patients, the patients with CAP who were treated as outpatient or hospitalized were included in the study. Considering the recommendations in the guidelines, we questioned the symptoms used for diagnosis, the signs with which the diagnosis of CAP was made and the hospitalization criteria of the physicians. We also examined the performed investigations, the methods and durations of treatment by the physicians for CAP in childhood. Finally, we compared the results with the guideline which was prepared for CAP in children by Turkish Thorax Society.

Results

In this study, 102 (31.7%) pediatrician, 90 (28%) pediatric residents, 62 (19.3%) family medicine specialists and 68 (21.1%) family medicine residents participated. Of the physicians participated in the study, 83 (25.8%) worked in university hospitals, 152 (47.2%) worked in education and research hospitals, 9 (2.8%) worked in family health centers while 22 (6.8%) worked in private hospitals (Table 1). Only 12 (11.8%) of the pediatric specialists, 4 of the pediatric residents (4.4%), 19 of the family medicine specialists (30.6%) and 3 of the family medicine residents (4.4%) diagnosed pneumonia with the symptoms and examination findings. The physicians in the family health center complied with the Turkish Thorax Society consensus report while making the diagnosis at a rate of 30.6%, which is more than that of the other physician groups. The most common criteria used by the physicians for diagnosing both on individual basis and as a whole group were symptoms, auscultation findings and chest X-ray.

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Considering the diagnostic tests for CAP; 60 (58.8%) pediatric specialists used chest x-ray, complete blood count and C-reactive protein (CRP), 25 (24.5%) pediatric specialists used chest X-ray, complete blood count, CRP and erythrocyte sedimentation (ESR) whereas 5 (4.9%) pediatric specialists used all of the tests. Similarly, all physician groups participated in our study used chest X-ray, complete blood count and CRP examinations together at the rate of 60%. We detected that in particular, both pediatric residents and specialists preferred all tests for CAP patients who were followed up as outpatient as well as for all severe pneumonia cases in the hospital. Furthermore, only 5% of all physician groups used pulse-oximetry at the time of diagnosis under outpatient clinic conditions. Especially, when we examined how much of the physicians used the criteria for determining hospitalization in outpatients and the criteria for classifying pneumonia (pneumonia, severe pneumonia, very severe pneumonia); we observed that 80.4% (n=82) of pediatric specialists, 75.5% (n=68) of pediatric residents, 77.4% (n=48) of family medicine specialists and only 66.2% (n=45) of family medicine residents used these criteria during examination. Blood culture was requested from inpatients at a rate of 48.2% by pediatric residents and specialists. This rate was lower for family medicine specialists (25%). Similarly, among all physician groups, the rate of requesting viral antigen tests from nasopharyngeal aspirate was determined to be 10.5% in this study.

On the contrary to guidelines, in outpatients, amoxicillin was the least preferred antibiotic even for mild pneumonia in patients

aged between 3 months and 5 years. On the other hand, 55% of the physicians preferred parenteral treatment with ampicillin/sulbactam in outpatient treatment (Table 2). However, when all physician groups were considered, the most commonly used antibiotic as the first treatment choice for hospitalized patients was ampicillin/sulbactam as it was supposed to be (88.5%). But in some centers, ceftriaxone was observed to be used as the first choice of treatment (7.2%). Additionally, in outpatient treatment, especially the family medicine specialists (12.7%) working in the family health centers added drugs such as mucolytics and antitussives although it was not recommended in the world and in our country. In respect to the duration of treatment, 83.5% of the physicians complied with the guidelines. However, it was observed that 15.7% of pediatric specialists and 21.1% of pediatric residents completed the treatment in a short period like five days (Table 3). Improvement in symptoms and auscultation findings were found to be sufficient to terminate the treatment by 77.1% of all physicians while 13.7% of pediatric specialists needed an improvement in chest x-ray additionally.

Discussion

WHO defines pneumonia as a clinical picture accompanied with increased respiratory rate (tachypnea), acute cough or respiratory distress and fever. However the specificity of this definition is low [8]. The guidelines in our country and around the world suggest the symptoms of the patient (acute cough, tachypnea, thoracic

Table 1: Areas of specialization of physicians participating in the study and Distributions of the institutions they work.

Physician number	Pediatrician	Pediatric assistant	Family medicine specialist	Family medicine specialist assistant	
n (%)	102 (31.7)	90(28)	62(19.2)	68(21.1)	
Institutions they work	University hospital	Training and research Hospital	public hospital	Family health center	Private hospital
n (%)	83 (25.8)	152 (47.2)	9 (2.8)	56 (17.4)	22 (6.8)

Table 2: First-line antibiotics used by physicians in patients with CAP.

	Drug	Pediatrician N (%)	Pediatric assistant N (%)	Family medicine specialist N (%)	Family medicine specialist assistant N (%)	Total N (%)
Empirical antibiotic preference in pneumonitis (3 months to 5 years)	Penicillin G or V	6 (5,9)	1 (1,1)	3 (4,8)	12 (17,6)	22 (6,8)
	Amoxycillin	5 (4,9)	8 (8,9)	0 (-)	4 (5,9)	17 (5,3)
	Ampicillin	2 (2)	11 (12,2)	3 (4,8)	0 (0)	16 (5)
	Amoxicillin / Clavulanic acid	16 (15,7)	26 (28,9)	38 (61,3)	22 (32,4)	102 (31,7)
	Ampicillin / Sulbactam	56 (54,9)	30 (33,3)	3 (4,8)	21 (30,9)	110 (34,2)
	Cefuroxime	9 (8,8)	6 (6,7)	3 (4,8)	0 (0)	18 (5,6)
	ceftriaxone	2 (2)	2 (2,2)	3 (4,8)	0 (0)	7 (2,2)
	Cefotaxime	1 (1)	2 (2,2)	0 0-)	0 (0)	3 (0,9)
	Erythromycin	0 (0)	0 0-)	0 (0)	6 (8,8)	6 (1,9)
	Azithromycin	0 (0)	1 (1,1)	0 (0)	0 (%-)	1 (0,3)
	Clarithromycin	5 (4,9)	3 (3,3)	9 (14,5)	1 (1,5)	18 (5,6)
	No idea	0 (0)	0 (0)	0 (0)	2 (2,9)	2 (0,6)

Table 3: Mean CAP treatment duration of physicians.

		Pediatrician N (%)	Pediatric assistant N (%)	Family medicine specialist N (%)	Family medicine specialist assistant N (%)	Total N (%)
Treatment duration	5 day\	16 (15,7)	19 (21,1)	6 (9,7)	12 (17,6)	53 (16,5)
	7 day	40 (39,2)	44 (48,9)	21 (33,9)	26 (38,2)	131 (40,7)
	10 day	44 (43,1)	24 (26,7)	29 (46,8)	27 (39,7)	124 (38,5)
	14 day\	2 (2)	3 (3,3)	6 (9,7)	3 (4,4)	14 (4,3)

retractions and high fever) and clinical evaluation (auscultation findings) while diagnosing CAP [8]. In spite of this, only 11.8% of all physicians diagnosed CAP with these criteria. This rate was a little higher for family medicine specialists. Difficulty in accessing radiological and other investigations may be the reason behind this.

Almost all guidelines recommend use of these investigations only for inpatients and suggest empiric treatment for cases who can be followed up as outpatient [7,9]. Nevertheless, using these investigations can be due to lack of education, inadequate explanation of the guidelines to related specialties, sometimes the insistency of patients and the fear of skipping a case by the physicians since pneumonia is a serious disease.

The rate of using criteria for classification of severity and identification of patients who should be hospitalized was found to be 75.5% in all physicians group. However, the severity classification of pneumonia and which patients should be treated under hospitalization were stated in both our consensus report in our country and the guidelines in the world [10]. Use of these criteria more commonly by the pediatricians compared to family physicians can be attributed to the fact that they examine more patients with pneumonia and follow up more patients after hospitalization. The reason why the rates are not at the desired level can be seeing a large number of patients by a physician in polyclinic in our country. Although these criteria were not completely known, it was observed that the majority of these patients who should have been hospitalized was hospitalized and received inpatient treatment. We consider that experience can be an important criterion. The rate of blood culture positivity in children who were followed up in outpatient clinics was 2.7%. While the rate of blood culture positivity is 10-20% in hospitalized patients, it increases up to 30-40% in patients with parapneumonic effusion or empyema [7,9,11]. Therefore, blood culture should be taken from the hospitalized children with high fever and severe disease before antibiotic therapy is initiated. In a recent study, it was observed that the rate of taking blood culture from the hospitalized patients by physicians who were trained increased from 53% to 100% and continued like this for 12 months [12]. Considering the initial rates, the results matched with our data, while the guideline from Pediatric Infectious Diseases Society of America recommended routine use of viral antigen tests for inpatients and outpatients (especially to reduce unnecessary antibiotic use) [9]. The guideline in our country does not recommend use of these tests routinely but recommends planning of specific viral antigens (Ag) use from nasopharyngeal aspirate for the rapid diagnosis in hospitalized patients, in infants under 18 months of age and in appropriate season [7]. The reason why these tests are not routinely recommended in our country could be that they are expensive and are not accessible in all centers. Additionally, the coexistence of accompanying bacterial infections to viral pneumonias which is seen at a rate of 30-40% could affect this result. Antibiotic therapy stays as empiric therapy in a large proportion of children patients until more reliable and rapid diagnostic tests are developed. Empirical therapy is arranged based on age, the most common probable pathogens and local microbiological data [5-9]. Although the guidelines suggest oral antibiotics, even in patients with severe CAP since they are safe and effective, the use of a parenteral drug predominantly as the first choice, especially in patients who are treated as outpatient is the clearest sign that these guidelines are not complied. In a study conducted in Greece in

2014, CAP was detected to be the disease group with the highest diversity of antibiotics as the first choice among physicians [13]. In the guideline of our country, amoxicillin is recommended for both under and over 5 years of age, if an atypical pathogen is suspected, then macrolide antibiotics are recommended in the treatment. Because amoxicillin is effective against most of the pathogens causing CAP, especially against streptococcus pneumonia which is the most commonly seen invasive pathogen. Alternatively, co-amoxiclav, cefaclor, erythromycin, azithromycin and clarithromycin should be preferred. However, up to 55% of the physicians preferred the parenteral treatment with ampicillin/sulbactam (Table 2). This can be attributed to awareness of the fear that pneumonia may be a fatal disease by the physicians and the families. There are similar results in the world as well. Lakic et al. [14] also emphasized that azithromycin was the most commonly preferred antibiotic in lower respiratory tract infections in Serbia and that this was not consistent with the national guideline and that the physicians should be re-educated about antibiotics. In USA, Pediatric Infectious Diseases Society Guidelines recommend ampicillin or amoxicillin for children hospitalized with CAP. As far as its effect is concerned, prescribing of ampicillin/amoxicillin has increased following guideline publication, but still remains low. Cephalosporin and macrolide prescribing has decreased but still remains common [15].

There are no randomized controlled studies on the duration of treatment in CAP. According to the Turkish Thoracic Society, the duration of treatment in uncomplicated cases was determined as 7-10 days or 5 more days after fever resolution [7]. In another study, it was stated that not initiating antibiotics within the first 4 hours of hospitalization in patients who were hospitalized due to CAP increases the length of stay but the delay of 8 hours may increase the mortality [16]. In our study, 83.5% of the physicians complied with the guidelines regarding the duration of treatment. In addition, some pediatricians felt that improvement in chest x-ray was a necessity considering the duration of treatment. However, it should be taken into consideration that radiological improvement can take up to 3 months.

Conclusion

This study indicates that there is not adequate compliance with the guidelines in terms of diagnosis and treatment of CAP in children and invasive and costly examinations are performed. In line with these results we suggest that all physicians should be educated and informed about the recommended guidelines. By this means, in addition to decreasing morbidity and mortality associated with CAP, we believe that the use of unnecessary antibiotics will be prevented and also the development of resistance against antibiotics will be avoided.

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