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APPROACHES TO PEDIATRIC ACUTE BACTERIAL RHINOSINUSITIS OF PHYSICIANS WITH DIFFERENT SPECIALTIES

FARKLI HEKİM GRUPLARININ PEDİATRİK AKUT BAKTERİYEL RİNOSİNÜZİTE YAKLAŞIMLARI

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Abstract

Objective: Our aim in this study is to analyze the compliance rates with current guidelines by raising awareness among pediatricians, otolaryngologists, general practitioners and family physicians about the diagnosis and treatment of acute bacterial rhinosinusitis.
Methods: A survey containing 18 questions was sent to physicians working in the Marmara Region of Turkey. The responses and variables, including age, gender, duration of professional experience, specialty area, and the number of cases diagnosed in one month, were evaluated concerning the current guidelines from the American Society of Infectious Diseases.
Results: Totally 500 physicians were enrolled into this study. The majority of the physicians participating in the study [91,4% (n=458)] did not know how to differentiate acute rhinosinusitis from viral upper respiratory tract infection clinically. The number of physicians prescribing the correct antibiotic but at the wrong dosage was 186 (37.2%). It was observed that general physicians made more mistakes in determining the diagnosis with the correct criteria than the other specialties (p=0.03).
Conclusion: There appears to be a problem of clinical inertia in the diagnosis and treatment of pediatric acute bacterial rhinosinusitis at the emergency department in Turkey, possibly due to unfamiliarity with the condition, patient overload, worries about performance fees, and failure to update medical knowledge concerning current guidelines. Increased emphasis on continuing professional education and various supportive measures for primary care physicians may help to resolve this.

Keywords: *Acute rhinosinusitis, antibiotic resistance, diagnosis.*

Öz

Amaç: Çalışmamızdaki amaç çocuk sağlığı ve hastalıkları uzmanları, kulak burun boğaz uzmanları, pratisyen hekimler ve aile hekimleri arasında akut bakteriyel rinosinüzit tanı ve tedavisi konusunda farkındalık yaratarak güncel kılavuzlara uyum oranlarını analiz etmektir.
Yöntem: Marmara Bölgesi'nde görev yapan hekimlere 18 sorudan oluşan bir anket gönderilmiştir. Yaş, cinsiyet, mesleki deneyim süresi, uzmanlık alanı ve bir ay içinde teşhis edilen vaka sayısı gibi yanıtlar ve değişkenler, Amerikan Enfeksiyon Hastalıkları Derneği'nin güncel kılavuzlarına göre değerlendirildi.
Bulgular: Bu çalışmaya toplam 500 hekim katıldı. Hekimlerin çoğunluğunun [91,4% (n=458)] akut rinosinüziti viral üst solunum yolu enfeksiyonundan klinik olarak nasıl ayırt edeceklerini bilmediği gözlemlendi. Doğru antibiyotiği yanlış dozda reçete eden hekim sayısı 186 (%37,2) idi. Pratisyen hekimlerin diğer branşlara göre doğru kriterlerle tanı koymada daha fazla hata yaptıkları görüldü (p=0,03).
Sonuç: Türkiye'de acil serviste pediatrik akut bakteriyel rinosinüzit tanı ve tedavisinde, muhtemelen duruma aşina olmama, aşırı hasta yükü, performans ücretleriyle ilgili endişeler ve mevcut kılavuzlarla ilgili tıbbi bilgilerin güncellenmemesi nedeniyle klinik atalet sorunu olduğu görülmektedir. Sürekli mesleki eğitime artan vurgu ve birinci basamak hekimleri için çeşitli destekleyici önlemler bu sorunu çözmeye yardımcı olabilir.

Anahtar Kelimeler: *Akut rinosinüzit, antibiyotik direnci, tanı.*

Introduction

Upper respiratory tract infection (URTI) is common at all ages and can cause acute bacterial rhinosinusitis (ABRS). Most people have several URTIs each year, and during these attacks, the sinuses are mostly affected, and these cases transform to ABRS at a rate of 1-10%.[1]
The diagnosis of ABRS is made clinically according to the guideline of the Infectious Diseases Society (IDSA). According to IDSA, treatment of ABRS should be started as soon as the diagnosis is made, and the first choice in antibiotic treatment should be Amoxicillin-clavulanate at a dose of 90 mg/kg/day, and the treatment should last 10-14 days.[2]
ABRS is the fifth most common reason for prescribing antibiotics in childhood.[3]
This study aimed to determine how correctly physicians diagnosed ABRS in childhood and how well they adhered to diagnosis and treatment guidelines.

Methods

This cross-sectional questionnaire study was conducted by the Department of Pediatric Infectious Diseases at Kocaeli University. Pediatricians, otolaryngologists, family physicians, and general physicians working in the Marmara Region of Turkey were enrolled in the study. The study was carried out from December 2017 to February 2018. Participants were divided into subgroups according to their areas of expertise and time of experience (0-3 years, 4-6 years, 7-11 years, and ≥ 12 years).

Collected Data

A questionnaire consisting of 18 questions was sent to the participants in which the approach to ABRS was evaluated (see Appendix). Participants supplied their responses either electronically or through face-to-face interviews.
The questionnaire included the following questions:

1) What is your area of expertise?
   - o Child Health and Diseases
   - o Ear Nose Throat
   - o Family Medicine
   - o General Physicians

2) Your year of graduation from medical school?
3) Your age?
4) Your gender?
5) How often do you diagnose acute sinusitis (ICD-10 J01) in the center where you work?
   - o 1-5 cases per month
   - o 5-10 cases per month
   - o 10-20 cases per month
   - o More than 20 times a month

6) On average, how many days do the symptoms of patients diagnosed with acute sinusitis last before they come to you?
7) Which clinical findings do you think are important in differentiating acute bacterial rhinosinusitis from viral upper respiratory tract infection?
8) In which cases do you start antibiotic treatment for acute sinusitis?
9) How many days do you continue your antibiotic treatment for acute sinusitis?
10) Which antibiotic do you prefer as the first choice in acute sinusitis in children, at which dose?
11) In order for acute sinusitis to become chronic, at least how many days must the symptoms last?
12) If symptoms do not regress, would you change your antibiotic treatment?
   - o No, I wouldn't change
   - o Yes

13) If your answer to the previous question is yes, after how many days would you change it?
14) In cases where you cannot apply the antibiotic that you would prefer first for various reasons, which antibiotic do you prefer as an alternative, at which dose?
15) Is the combination of amoxicillin/clavulanic acid, an antibiotic used in the treatment of acute sinusitis, superior to amoxicillin alone?
   - o Yes
   - o No
   - o I have no idea

16) How do you diagnose acute sinusitis?
(More than one option can be ticked)
   - o Postnasal purulent discharge
   - o Duration of symptoms
   - o Acute phase markers (white blood cell, CRP, sedimentation rate)
   - o High fever
   - o Waters graph
   - o Headache
   - o Tenderness by pressing on the sinuses

17) Which of the following(s) do you give alone or in addition to antibiotic treatment in acute sinusitis?
(More than one option can be ticked)
   - o Saline lavage/drip
   - o Decongestant nasal drops
   - o Oral decongestant
   - o Antihistaminic nasal drops
   - o Oral antihistaminic
   - o Antipyretic
   - o Antipyretic+anti-inflammatory

18) What is the imaging method you would prefer first in case the infection spreads and becomes complicated?

Statistical Analysis

Statistical analysis of the findings was performed with the SPSS, version 21.0 (IBM Inc., Armonk, NY, USA). In addition to descriptive statistical methods, the Shapiro-Wilk test was used to assess the normality of the data set distribution. Furthermore, the chi-square test for comparison of categorical data, the Spearman correlation test for continuous and ordinal data that were not normally.

Results

The study was conducted with a total of 500 clinicians, including pediatricians, ENT specialists, family physicians, and general physicians working in the Marmara Region. Approximately half of the participants were pediatricians The mean age of the participants was 33.4±6.9 years and the median (range) professional experience was 7.8 (1-40) years. Details of participant specialties and clinical experience are given in Table 1.

Table 1. Professional characteristics of the physicians participating

		n	*(%)*
Field of medicine	Pediatrician	255	51.0
	Ear-Nose-Throat	55	11.0
	Family Physicians	74	14.8
	General Physician	116	23.2
	Total	500	100
Experience	0-3 years	114	22.8
	4-6 years	127	25.4
	7-11 years	130	26.0
	12 years and more	129	25.8
	Total	500	100

Physicians were incorrect in making the clinical distinction between ABRS from viral rhinosinusitis according to the IDSA guideline, at a rate of 91.6% (Table 2).

Table 2. Distinction rates between ABRS and viral URTI diagnosis

	n	*%*
Physicians make distinctions correctly	42	8.4
Physicians making distinctions incorrectly	458	91.6
Total	500	100

The number of physicians who started the first-choice antibiotic treatment for patients diagnosed with ABRS, with the correct antibiotic and the correct dosage, was 186 (37.2%), while the number of physicians who continued the antibiotic treatment for 10-14 days was 364 (72.8%) (Table 3).

The number of physicians who chose amoxicillin-clavulanic acid as the first-choice antibiotic but did not start the treatment with the correct dosage was 213 (42.6%) (Table 4).

Eighty-seven (17.4%) participants used Waters X-rays and 116 (23.2%) participants used acute phase markers to diagnose ABRS. The acute phase reactant was used more by physicians with more than 12 years of experience in the diagnosis of ABRS compared to those with less experience. (n=90).

Table 3. Choice of correct antibiotics for patients diagnosed with acute bacterial rhinosinusitis and treatment duration rates

		n (%)
Antibiotic treatment duration	10-14 days	364 (72.8)
	Others	136 (27.2)
	Total	500 (100)
First-choice antibiotic therapy for the diagnosis of acute sinusitis	Amoxicillin/clavulanic acid (80-90 mg/kg/day)	186 (37.2)
	Others	314 (62.8)

In the logistic regression analysis, in which pediatricians were taken as a reference, it was seen that general physicians made more mistakes in using the correct clinical criteria for the diagnosis of ABRS compared to other branches. (*p*=0.002, 95% CI: 1.30-3.41) (Table 5)

Table 4. Rates of physicians who choose amoxicillin-clavulanic acid first and at the right dose for ABRS patients

		Number of physicians choosing amoxicillin-clavulanic acid		
		Yes	**No**	**Total**
At the correct dosage	**Yes**	186 (37.2)	0	186 (37.2)
	No	213 (42.6)	101(20.2)	314 (62.8)
	Total	399 (79.8)	101 (20.2)	500 (100)

General physicians, in the regression analysis performed at the point of antibiotic treatment duration in patients diagnosed with ABRS, were found to make more mistakes when pediatricians were taken as a reference than other branches. (*p*=0.001, 95% CI: 3.8-11.1)

In the regression analysis performed in terms of starting antibiotic treatment at the correct time in patients diagnosed with ABRS, ENT physicians wrongly specified treatment initiation time, at a rate of 2.34 times (*p*=0.02, 95% CI: 1.16-4.87) compared to other physicians participating.

Table 5. Regression analysis to determine the diagnosis of ABRS according to the correct clinical criteria

	B	*p*	*Exp(B)*	*Exp(B) for 95% CI*		*R2*
				Lower Limit	**Upper Limit**	
Pediatricians			1(reference)			
Ear-nose-throat physicians	0.323	0.581	1.382	0.670	2.848	0.06
Family doctors	0.354	0.524	0.702	0.397	1.242	
General physicians	-0.744	0.002	0.475	0.293	0.771	

B: Logistics coefficient, Exp(B): Logistics exponential coefficient, CI: Confidence interval, R: "Nagelkerke square"

Discussion

This study identified several problems concerning the diagnosis and treatment of pediatric ABRS across both primary care and hospital specialties likely to encounter the condition, in Turkey. The current IDSA guideline is available to all clinicians, but there is great variation in adherence to the guideline in terms of correct diagnosis, appropriate choice of antibiotic, and dosage.

We showed that participants were not successful in distinguishing ABRS from viral URTI. It can be thought that this leads to the unnecessary use of antibiotics. Antibiotic resistance is a serious problem in worldwide in terms of mortality, morbidity, and cost.[4] According to this problem, it is projected that in 2050, 10 million people will be exposed to mortality per year which will cost more than 300 billion $ annually.[5] Raising awareness about ABRS diagnosis by local health directorates can solve this problem. General physicians made the diagnosis of ABRS in accordance with the guideline at a lower rate than the other physician groups. In a study conducted in a tertiary center, it was reported that 47.2% of the patients who applied to the emergency department were not actually emergency cases and the majority of them were upper respiratory tract infections, which caused disruptions in health services.[6] Consistent with this report, we think those general physicians who work in intensive emergency departments

make correct diagnoses at lower rates since they cannot spare enough time for detailed examinations.

Our study also showed that general physicians continued antibiotic treatment for children with ABRS for the wrong duration, six times more often than physicians in other specialties. In our opinion, reducing the patient density in emergency services and training general physicians on the use of diagnosis-treatment guides can help solve this situation.

We observed that physicians with ≥ 12 years of experience required acute phase reactants and Waters X-ray for the diagnosis of ABRS more than those with less experience. This is a problem that can cause unnecessary invasive testing and radiation exposure. A study showed that the burnout syndrome effect negatively on the ability to diagnose and increases with experience in physicians.[7] We suggest that this issue can be solved by improving physicians' working conditions.

Otolaryngologists made more mistakes in the timing of empirical antibiotic treatment than other participants. It can be thought that the otolaryngologists participating in the study have wrong information about ABRS treatment. In fact, it was stated that patients with worsening ABRS should be referred to otolaryngologists to prevent complications.[8] We believe that otolaryngologists should follow current guidelines to satisfy this contradiction.

All these results may consider that ABRS patients who need treatment do not receive appropriate antibiotic therapy. This may result in an increased risk for patients to occur complications. It has been reported that complications of ABRS are serious problems and receiving appropriate antibiotics reduced this.[9] We recommend that it can be prevented by reproducing education programs.

It may not be known exactly who can access the online survey and the conditions for answering. Accordingly, the answers to the questionnaire may not provide objective data. Therefore, the results may not be generalized to the branches to which the participants belong. A recent study also supports this conclusion.[10] Consequently, we think that further studies on this subject will be helpful.

Conclusion

The result of our study indicates that general physician practitioners have first-degree priority in terms of in-service training. In conclusion, the diagnosis of ABRS is made in the light of the clinic and physical examination. In this context, we believe that approaching the patient with the correct clinical criteria will increase the true diagnosis rates and reduce unnecessary antibiotic use and resistance, which is a current problem in the world.

Conflict of Interest

The authors have no conflicts of interest to disclose.

Compliance with Ethical Statement

The study was approved by the Kocaeli University Non-Interventional Research Ethics Committee (Date: October 18, 2017, Number: 2017/297). The study was conducted in accordance with the Declaration of Helsinki.

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Author Contributions

Study Idea/Hypothesis and Desing: KD, SO; Data Collection: KD, TMA, SO; Analysis: KD, FK, SO; Manuscript writing: KD, FK, TMA, SO; Critical Review: KD, SO

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