

ORIGINAL ARTICLE

Attitudes and behaviors of Family Physicians regarding use of antibiotics

Oğuz Karabay¹, Davut Özdemir², Ertuğrul Güçlü³, Mustafa Yıldırım², Nevin İnce⁴,
Abdulkadir Küçükbayrak⁵, Selma Çakır⁶, Mustafa Gülenç⁷, Mehmet İnce⁸, Keziban Demirli⁹

¹Sakarya University, School of Medicine, Dept. of Infectious Diseases and Clinical Microbiology, Sakarya, Turkey

²Düzce University School of Medicine, Dept. of Infectious Diseases and Clinical Microbiology, Düzce, Turkey

³State Hospital, Dept. of Infectious Diseases and Clinical Microbiology, Ardahan, Turkey

⁴State Hospital, Dept. of Infectious Diseases and Clinical Microbiology, Nevşehir, Turkey

⁵İzzet Baysal University School of Medicine, Dept. of Infectious Diseases and Clinical Microbiology, Bolu, Turkey

⁶State Hospital, Dept. of Infectious Diseases and Clinical Microbiology, Gölcük, Kocaeli, Turkey

⁷State Hospital, Dept. of Infectious Diseases and Clinical Microbiology, Çaycuma, Zonguldak, Turkey

⁸Private Versa Hospital, Nevşehir, Turkey

⁹State Hospital, Dept. of Infectious Diseases and Clinical Microbiology, Hakkari, Turkey

ABSTRACT

Objectives: Antimicrobials are the most widely used drug groups and antibiotic resistance due to irrational antimicrobial usage is a major problem in the world. The aim of this study is to evaluate attitudes of family physicians antimicrobial prescribing.

Materials and methods: This study was conducted in November 2006 in Bolu and Duzce provinces where the first family physician practices were initiated in Turkey. The records of family physicians were reviewed retrospectively. Patients' data, social security institution of the patients, the diagnosis and prescribed antibiotics, duration, dosage and routes of antibiotic administration were recorded.

Results: A total of 4,497 patients were included in the study consisting of 1,752 (39%) men, and 2,745 (61%) women. The mean age of the patients was 36.6 ± 22.7 years. Antimicrobials were prescribed to 1,167 patients (25.9%). Among 1,167 antibiotics, 1,064 (91.2%) were administered orally, 77 (6.6%) were paranteral and 26 (2.2%) were taken through other routes. In 39 (3.3%) patients, there was no indication for antimicrobial use. In 103 patients (9.1%) from the accurate antibiotic indication group, the choice of the agent was not consistent with the guidelines. In 273 patients (23.4%) on antimicrobial therapy, duration of the antibiotic was inappropriate. The most common indication of the antibiotic prescription was tonsillopharyngitis and the most prescribed antibiotics for this diagnosis were beta lactam/beta lactamase inhibitors.

Conclusions: In conclusion, there is still considerable overuse of antibiotics by primary care patients, especially the ones suffering respiratory tract infections. Educational interventions on antimicrobial use could be useful. *J Microbiol Infect Dis* 2011;1(2): 53-57

Key words: Antibiotic usage, Family Physicians, Attitudes, Behaviors

Aile Hekimlerinin Antibiyotik Kullanımı Konusundaki Tutumları

ÖZET

Amaç: Günümüzde en sık kullanılan ilaçlar antimikrobiklerdir. Ancak bu ilaçların uygunsuz kullanımları sonucu gelişen antibiyotik direnci tüm dünyada giderek artan problemlerden biri olmaya devam etmektedir. Bu çalışmanın amacı, birinci basamak sağlık hizmetlerinde görev yapan aile hekimlerinin antimikrobiyal tedavi hakkındaki tutum ve davranışlarının araştırılmasıdır.

Gereç ve yöntem: Çalışma, aile hekimliğinin ilk uygulanmaya başladığı yerler olan Bolu ve Düzce illerinde yapılmıştır. Aile hekimlerinin tanı ve tedavi kayıtları retrospektif olarak incelenmiştir. Hastaların demografik özellikleri, sosyal güvenceleri, konulan tanı ve reçete edilen antibiyotikler, antibiyotiğin verilmiş yolu, süresi ve dozu incelenerek standart bir forma kaydedilmiştir.

Bulgular: Çalışmaya 1752'si erkek (% 39), 2745'i kadın (% 61) olmak üzere toplam 4497 hastanın verisi alınmıştır. Hastaların yaş ortalamaları 36,6±22,7 idi. Toplam 1167 (%25,9) hastaya antibiyotik tedavisi verilmişti. Antibiyotik tedavisi

Correspondence: Dr. Oğuz Karabay, Sakarya University, School of Medicine, Department of Infectious Diseases and Clinical Microbiology, Sakarya, Turkey Email: drkarabay@yahoo.com

Received: 08.09.2011, Accepted: 28.09.2011

Copyright © Journal of Microbiology and Infectious Diseases 2011, All rights reserved

verilenlerin 1064'ü (% 91,2) oral, 77'si (% 6,6) parenteral ve 26 (% 2,2) tanesi diğer yollardan verilmişti. Hastaların 39'unda (%3,3) antibiyotik tedavisi için endikasyon saptanmadı. Antibiyotik tedavisi için endikasyonu olan hastaların 103'ünde (%9,1) seçilen ilaç antibiyotik rehberlerine uygun değildi. Antimikrobiyal tedavi uygulanan hastaların 273'ünde (% 23,4) tedavi süresi uygunsuzdu. Aile hekimlerinin en sık antibiyotik yazma endikasyonu tonsillofarenjit ve bu tanı için en sık reçete edilen antibiyotikler beta-laktam/beta-laktamaz inhibitörleriydi.

Sonuç: Sonuç olarak, solunum yolu enfeksiyonları başta olmak üzere birinci basamakta tedavi verilen hastalarda, antibiyotik kullanımı oldukça fazladır. Birinci basamakta çalışan hekimlere rasyonel antimikrobiyal kullanımı ile ilgili mezuniyet sonrası periyodik eğitimler düzenlenmelidir.

Anahtar kelimeler: Antibiyotik kullanımı, Aile hekimliği, alışkanlık, davranış

INTRODUCTION

The rational drug usage requires definition of the patient's complaints, establishment of the correct diagnosis, determination of the goal of therapy, selection of the effective and safe drugs, and starting therapy by providing patients with clear information and instructions about prescription, and monitoring and evaluation of the results of treatment. The term "rational drug use" was described at the World Health Organization conference in 1985 in Nairobi as "Giving medications appropriate to patient's clinical needs, in doses that meet their own individual requirements for an adequate period of time, and at the lowest cost to them and their community".¹⁻²

While, cardiovascular drugs are the most consumed drugs worldwide, antibiotics are the most consumed drug groups in our country like the other developing countries.³ In infectious diseases, generally medical achievement is obtained with early diagnosis and rational antimicrobial therapy. Rational drug use is important in that it prevents complications, shortens the duration and severity of illness and survival. If community and hospital acquired infections are not treated effectively because of irrational antimicrobial use (unnecessary use, the wrong choice of antibiotic, wrong dosage and/or route), duration of the disease may extend.⁴ In addition, antibiotic usage in viral infections causes antibiotic resistance to increase and unnecessary expenditures.⁵

Different payment institutions such as Social Insurance Institution, Pension Fund, BAG-KUR, and Green Card had operated in Turkey until 2005. However, after 2005, these agencies were put under one roof, and facilitated access to health services and drugs.⁶ This situation has led to increased consumption of all drugs, including antibiotics.

Many studies have been conducted on the use of antibiotics in primary health care in our

country. It was shown that the most common antibiotic consumption in primary health care was due to respiratory tract infections. Another common finding of these studies is the frequent and often inappropriate usage of antibiotics.^{7,8} Şaşmaz et al.⁹ detected that in a study examining records of the patients admitted to primary health care; patients were most often diagnosed with acute respiratory tract infection (32.4%) and mainly penicillins (56.1%), macrolides (21.9%), and cephalosporins (11.5%) were prescribed to them.

The aim of this study was to investigate the attitude and behaviors of family physicians regarding antimicrobial therapy in Bolu and Düzce provinces where the family physician was practiced.

MATERIALS AND METHODS

This study was designed retrospectively and conducted in Bolu and Duzce provinces in Turkey, between November 2006 and January 2007 by collecting data from family physicians' records. Düzce and Bolu provinces, which have a population of 323,328 and 271,545, respectively, are the cities located in the Western Black Sea region of Turkey.^{10,11} Both rural and urban area patients' records of family physicians who accepted to participate in this study were investigated, after obligatory permissions were obtained from Bolu and Düzce Provincial Directors of Health.

Patients' demographic, social security information, diagnoses and used antibiotics, treatment duration, dose and routes of antibiotic administration were recorded on a standard form. By reviewing the records, diagnosis, treatments given to patients, administration routes and doses were compared with guidelines. Indication for antibiotics, appropriateness of antibiotic indication, compliance with treatment duration, and route of administration of the dose was assessed.

RESULTS

A total of 4,497 patients' data were obtained during the study period. Of these patients, 1,752 (39%) were men and 2,745 (61%) were women. Their mean age was 36.6 ± 22.7 years. A total of 1,167 patients (25.9%) were on antimicrobial therapy. Only one antibiotic was written in each recipe in all patients. 2,911 (64.7%) patients' social security institution status was achieved. While antibiotics had been prescribed to 708 of 2,596 patients who have social security, they were prescribed to 67/315 patients who are not covered by any social security institution (p<0.05).

Out of the 1,167 antibiotics, 1,064 (91.2%) were administered orally, 77 (6.6%) were administered parenterally and 26 (2.2%) were administered through the other routes. Prescribed antibiotics and the rates of them are presented in Figure 1. According to our study results, tonsillopharyngitis was the most common indication for antibiotic prescribing (n=468, 40.1%). Beta lactam/beta lactamase inhibitors were prescribed to 52.1% (n=244) patients with this diagnose. Out of

1167 patients, 39 (3.3%) patients did not have any antibiotic indication. Also, in 103 patients (9.1%) among the true antibiotic indication, the choice of the agent was not in line with the guidelines; and in 273 patients (23.4%) on antimicrobial therapy, duration of the antibiotic was inappropriate (Table 1).

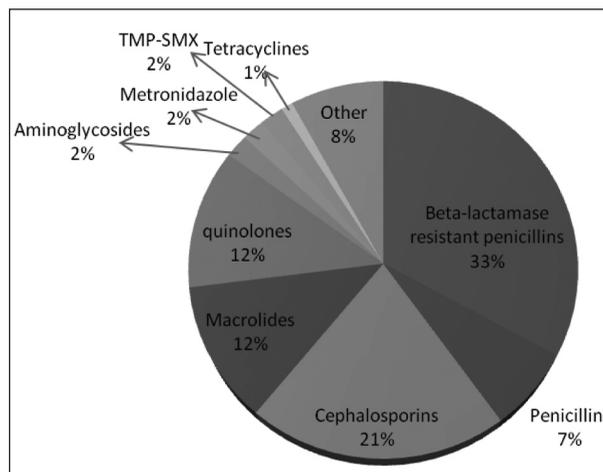


Figure 1. The most preferred antibiotics by family physicians in primary care.

Table 1. The most commonly used antibiotics in family medicine and indications.

Parameter	n (%)
Antibiotics without indication	39 (3,3)
Incompliance of antibiotic indication	103 (9,1)
Incompliance of the treatment period	273 (23,4)
The number of patients in the study	4497
The number of patients who received antibiotics	1167 (25,9)
The most common indication for antibiotic use	Tonsillopharyngitis n= 468 (40,1)
The most commonly used antibiotics in tonsillopharyngitis	Beta-lactam/beta-lactamase inhibitors (52,1)

DISCUSSION

As in all over the world, antibiotics are prescribed in a high proportion in our country. For many years in Turkey, the most consumed drug group was antibiotics. When the drug consumption rates were evaluated according to therapy groups, it was seen that 20.4% in 1999, and 18.1% in 2002 were antibiotics.³ In 2010, out of the 1,570 million box used drugs, 223.8 million boxes were systemic anti-infectives.¹²

Unfortunately, irrational use of antimicrobials is a very common occasion. In other words, anti-

biotics are one of the most abused drug groups.⁵ In a study undertaken in Vietnam in 1997, researchers discovered that more than 70% of patients were prescribed with inadequate amounts of antimicrobials for serious infections. In China, researchers found that 63% of antimicrobials selected to treat proven bacterial infections were simply the wrong choice, while 50% of drugs dispensed in one hospital unit in Bangladesh were inappropriate. The same is true even for the countries like Canada and the United States which developed their antibiotic usage control mecha-

nisms. In these countries, it is estimated that physicians over-prescribe antibiotics by 50%.¹³

In our study, we determined that there was no antibiotic indication in 3.3% patient, and the choice of the agent was inappropriate to the indication in 9.1% patient among the true antibiotic indication. Furthermore, our findings revealed that the duration of the antibiotic was found inadequate in 23.4% patients.

Antibiotics were used unnecessarily in many developing countries. This situation was shown in both primary health care facilities, and hospitals.^{14,15} In our country, 15-20% of all prescribed drugs are antibiotics. Antibiotics have been the most used drugs for many years. The main reasons of unnecessary usage may be related with insufficient medical education about antibiotics, pharmaceutical industrial pressure and promotions, absence of antibiotic policy, and absence of antibiotic guide for primary health care. Antibiotic overuse is an important problem for many countries. For example, in our study the most common antibiotic prescription indication was upper respiratory tract infections. However, we clearly know that only 20% of upper respiratory tract infections are bacterial. Many studies from our country showed that upper respiratory tract infections are the most common indication for unnecessary antibiotic prescription in primary health care facilities.¹⁶

It was reported that the most prescribed antibiotic groups in our country were; penicillins (67.8%), cephalosporins (36.6%), and macrolides (13.8%).¹⁷ The most prescribed antibiotic detected in our study was beta lactamase resistant penicillins with a rate of 33%. Cephalosporins (21%), quinolones (12%), and macrolides (12%) were the other most prescribed antibiotics in order. Panasiuk et al.¹⁸ indicated that, antibiotics are prescribed in approximately 87.5% of cases of pharyngitis and tonsillitis and the most preferred three antibiotics are amoxicillin (35.6%), amoxicillin-clavulanate (13.2%), and macrolides (10.4%). In our study, a total of 52.1% patient diagnosed as tonsillopharyngitis were treated with beta lactam/beta lactamase inhibitors. Similarly, this study showed that, beta lactam/beta lactamase inhibitors were the most preferred antibiotics in patients diagnosed as tonsillopharyngitis in primary care services. Preference of these drugs rather than penicillins in tonsillopharyngitis may

be due to simple use from oral route and marketing techniques of drug industry.

Drug expenditures play a major role in total health care spending of our social security institution. In our study, the amount of antibiotic prescription to patients who are covered by any social security scheme was found to be significantly higher than that of the patients who are not covered under any social security scheme. Antibiotics were prescribed to 27% of patients who are covered under any social security scheme, while they were written to 21% of patients who are not. This data suggest that, economic status of the patients was considered when prescribing antibiotics and they were written more easily for patients who are covered under any social security scheme than those who are not. In our opinion, application of electronic tracking systems to patients covered under any social security scheme can help to rational antibiotic use.

Before any conclusion, we should declare that our study had several limitations. We used only retrospective patient cards. We did not make face to face meeting or a questionnaire survey with doctors. If we could interview with doctors to this study, our data would be more powerful.

Conclusion

Rational antibiotic use will continue to be explored and discussed in terms of their use for true indication, in sufficient period, and in a cost effective manner. It was seen that; significant part of prescribed antibiotics were not prescribed for correct indication, and among the antibiotics prescribed for proper indication, some of them were unnecessarily in broad spectrum and their duration was inappropriate.

In order to ensure rational antibiotic use in primary health care, importance given placed on the use of antibiotics should be increased, and the focus on practical training, as well as theoretical knowledge in the course of medical education needs to be strengthened. Post-graduate training courses should be organized on common infections like the upper respiratory tract infections. In addition, laboratory facilities that contribute to the diagnosis in primary care should be increased. Consumption of antibiotics from pharmacies should be followed by an information system.

REFERENCES

1. World Health Organization (WHO). The rational use of drugs. Report of the Conference of Experts, Nairobi (25-29 November 1985) Geneva, 1987.
2. Akan H. Akılcı antibiyotik kullanımı ve Türk Hematoloji Derneği. ANKEM Derg. 2006; 20:65-67.
3. Top M, Tarcan M. Türkiye ilaç ekonomisi ve ilaç harcamaları 1998-2003 dönemi değerlendirmesi. Liberal Düşünce Dergisi 2004; 9;177-200.
4. Unal S: Rasyonel Antibiyotik Kullanımı ANKEM Derg. 2005;19:180-181.
5. Öztürk R. Akılcı antibiyotik kullanımı ve ülkemizde antimikrobik maddelere direnç sorunu. İ.Ü. Cerrahpaşa Tıp Fakültesi, Sürekli Tıp Eğitimi Etkinlikleri Sempozyum Dizisi No:61, 2008; 1-16.
6. Mollahaliloğlu S, Bora Başara B, Eryılmaz Z. T.C. Sağlık Bakanlığı. Sağlık İstatistikleri Yıllığı 2010. Hıfzıssıhha Mektebi Müdürlüğü, Refik Saydam Hıfzıssıhha Merkezi Başkanlığı, Sağlık Bakanlığı, Ankara, 2010.
7. Akici A, Kalaca S, Ugurlu MU, Oktay S. Prescribing habits of general practitioners in the treatment of childhood respiratory-tract infections, Eur J Clin Pharmacol 2004; 60:211-216.
8. Çetin ÇB, Yalçın AN, Turgut H, Çelik A, Çaylar A. Toplumda antibiyotik kullanımı, İnfeksiyon Dergisi 1999; 13: 263-265.
9. Şaşmaz T, Buğdaycı R, Kurt AÖ, Tezcan H. Mersin'de bir merkez Sağlık Ocağında Akut Solunum Yolu İnfeksiyonları için Reçete Edilen Antibiyotiklerin İncelenmesi, Mersin Üniversitesi Tıp Fakültesi Derg. 2002; 3: 185-190.
10. T.C. Düzce Valiliği. Available at: http://www.duzce.gov.tr/index.php?option=com_content&task=view&id=441&Itemid=193. (Accessed 24 September 2011).
11. T.C. Bolu Valiliği. Genel Bilgiler. Available at: http://www.bolu.gov.tr/documents/genel_bilgiler.pdf. (Accessed 24 September 2011)
12. Karabay O, Hosoglu S. Increased antimicrobial consumption following reimbursement reform in Turkey. J Antimicrob Chemother 2008; 61:1169-1171.
13. WHO (2000) Overcoming Antimicrobial Resistance. World Health Report on Infectious Diseases 2000, Geneva. <http://www.who.int/infectious-disease-report/2000/index>. (Accessed 16 June.2011)
14. Baytemur M. The problems in rationale antibiotic usage in primary health care. ANKEM Derg. 2005; 19:182-184.
15. Hosoglu S, Esen S, Ozturk R, et al. The effect of a restriction policy on the antimicrobial consumption in Turkey: a country-wide study. Eur J Clin Pharmacol 2005; 61: 727-731.
16. Sahin H, Arsu G, Koseli D, Buke C. Evaluation of primary health care physicians' knowledge on rational antibiotic use. Mikrobiyol Bul 2008; 42:343-348.
17. İlhan M. Toplumda antibiyotik kullanımı sıklığı ve hekimlerin antibiyotik reçetesi yazma durumları ile ilişkili etmenlerin belirlenmesi araştırması. T.C. Sağlık Bakanlığı Refik Saydam Hıfzıssıhha Merkezi Başkanlığı, Ankara, 2011.
18. Panasiuk L, Lukas W, Paprzycki P, Verheij T, Godycki-Ćwirko M, Chlabicz S. Antibiotics in the treatment of upper respiratory tract infections in Poland. Is there any improvement? J Clin Pharm Ther 2010; 35:665-669.