

Antibiotic Use for the Treatment of Upper Respiratory Infections in a Diverse Community

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BACKGROUND. Previous studies have not addressed whether cultural factors influence beliefs and practices related to the treatment of upper respiratory infections (URIs). The purpose of our project was to assess beliefs, care-seeking behavior, use of antibiotics, and means of obtaining antibiotics for the treatment of URIs among different ethnic groups in an urban community.

METHODS. A total of 192 adults completed a self-administered questionnaire indicating their likelihood of seeking care, the perceived effectiveness of treatment methods, and their usual use of treatment regimens for 2 scenarios consistent with uncomplicated URIs. Respondents were also asked about their use of antibiotics not prescribed by a physician for a URI.

RESULTS. A majority of subjects reported a belief in the effectiveness of antibiotics for URIs and indicated they are likely to seek care for URIs. Many (26%) had obtained antibiotics from sources other than a physician's prescription (eg, directly from pharmacists or a supplier outside the United States). Many (31%) believed that antibiotics should be available over the counter. Individuals who reported using antibiotics for a URI were more likely than those who did not to obtain them without a prescription (35% vs 11%, $P = .001$). Subjects with a cultural background from countries where antibiotics are available over the counter are more likely to use antibiotics not prescribed by a physician than those from countries with variably enforced regulations or the United States (40%, 30%, and 20%, respectively, $P = .049$).

CONCLUSIONS. Members of an ethnically diverse community believe antibiotics are effective for colds, are very likely to seek care for colds, and often obtain antibiotics without a prescription. The ease of antibiotic access worldwide may influence their use in some communities in the United States.

KEY WORDS. Common cold; antibiotics; prescriptions, drug; self-medication; emigration and immigration. (*J Fam Pract* 1999; 48:993-996)

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The widespread use of antibiotics for primarily viral self-limited respiratory infections has become a cause of great concern.¹ Investigators report that resistance to common respiratory tract pathogens is positively correlated with exposure to antibiotic treatment.²⁻⁴

Efforts in the United States to curtail antibiotic use have focused on changing physician prescribing patterns. However, the widespread use of antibiotics for upper respiratory infection (URIs) may be related to relatively poor knowledge among patients. In a study of adults in Kentucky and Louisiana, 79% thought antibiotics were effective for a clinical syndrome that was consistent with but not labeled a URI.⁵

In many countries, antibiotics are either legally available without a prescription, or existing regulations are not uniformly enforced. Studies indicate that in countries with little regulation, substantial misuse results.⁶ In a town on the US side of the US-Mexican border, 75% of the respondents had purchased prescription medications in Mexico without a prescription.⁷ Data from a variety of countries⁷⁻¹¹ suggest that self-medication is common and frequently inappropriate; antibiotics are often purchased without proper indication,⁸ in insufficient quantities,¹⁰⁻¹¹ or when contraindicated.¹¹⁻¹²

Recent reports suggest that in many immigrant neighborhoods in New York City, antibiotics are being obtained from pharmacies without a prescription.¹³ Such practices, if confirmed, likely mirror the cultural systems of self-diagnosis and self-management in the residents' countries of origin. The purpose of our project was to examine patients' knowledge of URI presentation, belief in the effectiveness of antibiotics, and practices regarding the use of antibiotics for common colds in an ethnically diverse community.

METHODS

Our data come from a self-administered survey of adults (18 years of age or older) approached by bilingual interviewers in diverse health care settings (outpatient clinics, private practices, emergency departments) and a community center in the Bronx and southern Westchester County, New York. Data were collected from September 1998 to March 1999, after approval from the appropriate institutional review boards. The Bronx and southern Westchester are ethnically and socioeconomically diverse. Spanish is the language spoken at home by 39% of the population.¹⁴

SURVEY INSTRUMENT

The survey included 2 scenarios previously used in studies of patients,⁵ primary care physicians,¹⁵ and clinical pharmacists.¹⁶ Both scenarios were consistent with an uncomplicated URI, varying only in the presence of clear or discolored nasal discharge. The scenarios were: (1) "You have had an illness for 5 days with the following symptoms: sore throat,

cough, and runny nose with clear discharge"; and (2) "You have had an illness for 5 days with the following symptoms: sore throat, cough, and runny nose with discolored discharge (yellow, green, brown)." Following the presentation of each scenario, respondents were asked to report their likelihood of seeking care, usual treatments for the illness described, and the effectiveness of a variety of treatments. For purposes of comparison with previous studies,^{5,15,16} the list of treatments was the same as that used in those studies and the treatments were randomly ordered to avoid the appearance of a priority of antibiotics. The subjects were asked if they had ever taken antibiotics that were not prescribed for them by a physician and, if so, how they obtained them. For this study, the questionnaire was translated to Spanish and back to English to assure retention of meaning, then pretested with Spanish-speaking subjects and revised.

ANALYSIS

We dichotomized the likelihood of use and perceived effectiveness of treatments (measured on 5-point scales) into categorical variables. For example, "very likely" and "somewhat likely" were collapsed into one category to compare with a second category combining "neutral", "somewhat unlikely," and "very unlikely." These categorical variables were then analyzed using chi-square tests.

To relate beliefs and practices regarding antibiotic access and use to countries of origin, we classified respondents into 1 of 3 groups as an indication of cultural background. These groups were: subject and subject's mother were both born in the United States (US); subject or subject's mother was born outside the mainland United States in a country or territory where there are regulations limiting antibiotic access (REGS); and subject or subject's mother was born in a country with over-the-counter antibiotics (OTC). Our categorization of specific countries is shown in Table 1. Access to antibiotics in the countries and territories of the second group (REGS) are diverse. Although all of those countries have regulations limiting antibiotic access, the degree of enforcement is variable.¹⁷ We determined antibiotic regulations through telephone and E-mail contact with embassies and Ministries of Health.

We computed bivariate analyses among the likelihood of seeking care, the use of antibiotics as a usual treatment for URIs, and the perceived effectiveness of antibiotics in relation to patient demographic characteristics. Similarly, we used bivariate analyses to relate the likelihood of seeking care, usual treatment, and perceived effectiveness of antibiotics to country of origin classification. We then determined if usual use, demographics, or country of origin classification correlated with positive reports of obtaining antibiotics without physician prescriptions.

RESULTS

Of the 221 subjects approached, 29 refused participation or returned incomplete surveys, resulting in 192 usable

surveys (87%). Table 2 shows the demographic characteristics of the sample. The majority of subjects (59%) were surveyed in primary care sites, 29% in an emergency department, and 12% in community centers.

Our results indicate that the majority of respondents were likely to seek care from a physician for both scenarios (Table 3). Slightly more than half (58%) of the respondents were somewhat or very likely to seek care for the scenario with clear nasal discharge, while 84% of the respondents were likely to seek care with discolored nasal discharge ($P < .001$). Our data also indicate that antibiotics were the usual treatment for URIs with both scenarios, although significantly more often when discolored nasal discharge was present. Antibiotics were also believed to be effective treatments for URIs by the majority of respondents for both scenarios (79% in the clear discharge scenario and 88% in the discolored discharge scenario, $P = .02$). The use of other treatments did not differ significantly between the 2 scenarios.

Twenty-six percent of respondents reported the use of antibiotics for URIs in the last year that were not prescribed for that condition by a physician. Non-prescription antibiotics were obtained from a variety of sources. In nonmutually exclusive categories, 61% used antibiotics left over from a previous illness; 46% obtained antibiotics from a family member; 31% obtained them directly from a pharmacist without a prescription; and 21% obtained them outside the United States. When asked if antibiotics should be available over the counter, 31% of subjects indicated they should.

Individuals who report using antibiotics for the URI scenario with clear nasal discharge were significantly more likely than those who did not to report having used antibiotics not prescribed for a cough or cold in the last year (35% vs 11%, $P = .001$). Similarly, individuals who believe that antibiotics are somewhat or very effective

TABLE 1

Categorization of Countries on the Basis of Ease of Access to Antibiotics

USA*	REGS†	OTC‡
United States	Barbados	Columbia
	Costa Rica	Dominican Republic
	Grenada	Ecuador
	Guyana	El Salvador
	Ireland	Guatemala
	Jamaica	Haiti
	Puerto Rico	Honduras
	Nicaragua	Mexico
		Philippines

REGS denotes countries with regulations limiting access to antibiotics; OTC, countries with antibiotics available over the counter.

*Subject and subject's mother were born in the United States.

†Subject or subject's mother was born in the given country.

TABLE 2

Demographics of the 192 Study Subjects

Characteristic	Percent, or Mean \pm SD
Men	17
Age, years	38.3 \pm 13.8
Race	
African-American	26.2
Caucasian	11.8
Hispanic	58.3
Other	3.7
Primary Language	
English	78
Spanish	18
Both	4
Health Insurance	
Private	27
Medicaid	58
Medicare	4
Other	4
None	7
Education	
Less than high school	30
High school graduate	29
Greater than high school	41
Income	
Median annual income, US dollars	14,900
Birthplace	
Continental United States	58.8
Puerto Rico	15.5
Dominican Republic	10.1
Jamaica	3.2
Central and South America	8.2
Other	4.2
Mother's Birthplace	
Continental United States	31.8
Puerto Rico	34.2
Dominican Republic	12.8
Jamaica	3.7
Central and South America	9.0
Other	9.0

SD denotes standard deviation.

more likely than either the REGS group or the USA group to report using antibiotics for a cough or cold that were not prescribed by a physician (40%, 30%, and 20%, respectively, $P = .049$). Subjects in the OTC group were also significantly more likely to seek care for the URI scenario with clear nasal discharge than the REGS group or the USA group, (80%, 56%, and 51%, $P = .01$). Belief in the effectiveness of antibiotics for the same scenario was very high (79%) and did not differ significantly among the groups.

DISCUSSION

Our study contributes additional evidence to the findings that patient knowledge of appropriate treatments for URIs is inconsistent with available evidence of treatment effectiveness.^{5,18} Our results have important implications in terms of the individual misuse of antibiotics for URIs. Nearly one third of the respondents believed antibiotics should be available over the counter. Of greater importance, a substantial proportion of individuals obtained antibiotics through a method other than a physician prescription for the condition; subjects not only used their own leftover medication, but they also used friends' and family members' leftover pills, obtained antibiotics directly from pharmacists, or from sources outside the United States. We found that those individuals who have used antibiotics for URIs in the past were much more likely to obtain them on their own rather than from a physician.

The diverse population sampled in this study appeared to be even more likely to seek care and to believe that antibiotics are effective for uncomplicated URIs than was previously found in the Kentucky and Louisiana study sample.⁵ This may be in part because of the ethnic diversity of the Bronx. Those subjects with a cultural background from a country or territory where antibiotics are available over the counter were more likely to either seek care in an attempt to obtain antibiotics for a common cold or use antibiotics obtained improperly.

LIMITATIONS

Several limitations must be considered when interpreting our results. First, there could be an effect exerted by the sequence of the 2 scenarios: Patients may have responded differently to the second scenario (with discolored discharge) because it followed the first. Although we made an effort to include all socioeconomic groups, 62% of the sample earned less than \$20,000 per year. Thus, it is difficult to disentangle the effect of low socioeconomic status from ethnicity or immigration issues. Similarly, it is possible that our finding of differences between groups on the basis of country of origin may reflect variables other than antibiotic access. Moreover, there is a paucity of published information regarding the actual ease of antibiotic access in many developing countries and territories where regulations

for the clear discharge scenario are more likely to feel that antibiotics should be available without a prescription (35% vs 17%, $P = .04$).

On the basis of their birthplace or the birthplace of their mothers, subjects were categorized into 3 groups that reflected control of antibiotic access in different countries (Table 1). Subjects in the OTC group were

TABLE 3

Survey Questions Answered by Study Subjects as "Somewhat Likely" or "Very Likely," by Scenario (n = 192)

Treatment	URI Scenario Including Clear Nasal Discharge, %	URI Scenario Including Discolored Nasal Discharge, %	P
Are you likely to seek care for this condition?	58	84	<.001
Are antibiotics your usual treatment for this condition?	64	77	.005
Are antibiotics an effective treatment for this condition?	79	88	.02

URI denotes upper respiratory infection.

exist but may not be strictly enforced. This may have led to our lumping together countries with easy access and more restricted access into the REGS group. This, however, would tend to bias our results toward the null hypothesis. A majority of subjects were recruited from health care settings, perhaps resulting in a bias toward those who use antibiotics. This, however, might tend to underestimate the actual number of people obtaining antibiotics improperly. Also, subjects may have been reluctant to report obtaining antibiotics without a prescription, again tending to underestimate the scope of the practice.

CONCLUSIONS

Clinicians providing care to ethnically diverse populations need to be sensitive to cultural differences in self-diagnosis and treatment with antibiotics and to provide appropriate patient education. Additional study is necessary to investigate the self-care practices of diverse populations regarding URIs, as they may influence the type and content of patient education. In addition, further study is required to confirm or reject our finding that patients obtain antibiotics directly from pharmacists. Finally, our findings suggest that the worldwide ease of antibiotic access influences the patterns of antibiotic use in some communities in the United States.

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