

# Antibiotics for acute respiratory tract symptoms: patients' expectations, GPs' management and patient satisfaction

Ineke Welschen, Marijke Kuyvenhoven, Arno Hoes and Theo Verheij

Welschen I, Kuyvenhoven M, Hoes A and Verheij T. Antibiotics for acute respiratory tract symptoms: patients' expectations, GPs' management and patient satisfaction. *Family Practice* 2004; **21**: 234–237.

**Background.** GPs often assume that prescribing antibiotics increases patient satisfaction.

**Objective.** The purpose of this study was to determine the associations between receiving antibiotics and information/reassurance on the one hand and patients' satisfaction on the other in patients with acute respiratory tract symptoms, and to assess whether this relationship is influenced by patients' expectations.

**Methods.** Questionnaires were distributed among patients presenting with acute respiratory tract symptoms in 51 general practices (122 GPs) in the region of Utrecht, The Netherlands. Outcome measures were patients' expectations, GPs' management regarding antibiotic prescribing and information/reassurance, and patient satisfaction.

**Results.** Information/reassurance was expected by 90% of the respondents (916/1014); 97% of those actually received it (888/916). Fifty percent expected antibiotics (467/926), while 73% of them received antibiotics (343/467). Receiving information/reassurance was more strongly associated with satisfaction than an antibiotic prescription [adjusted odds ratio (OR) 10.6; 95% confidence interval (CI) 5.6–20.1, and adjusted OR 2.2; 95% CI 1.3–3.8, respectively]. Patients' expectations towards antibiotics modified these associations; in patients not expecting antibiotics, receiving information/reassurance was the only independent determinant of satisfaction (adjusted OR 21.6; 95% CI 7.4–62.7) and in patients who expected antibiotics, actually receiving antibiotics and receiving information/reassurance were equally important determinants of satisfaction (adjusted OR 3.8; 95% CI 1.9–7.5, and adjusted OR 4.7; 95% CI 1.9–11.9, respectively).

**Conclusion.** GPs should first explore patients' expectations about antibiotic treatment before giving information about the self-limitedness of respiratory tract symptoms and (in)effectiveness of antibiotics in order to enhance shared decision making and rationalize antibiotic prescribing.

**Keywords.** Antibiotics, patient satisfaction, respiratory tract infections.

## Introduction

Acute respiratory tract infections are very common in general practice.<sup>1–5</sup> Most of these infections are self-limiting, and benefit from antibiotic treatment is only modest.<sup>1–5</sup> Despite evidence-based guidelines recommending restrictive use of antibiotics, antibiotic prescribing remains common.<sup>6,7</sup> Superfluous use of

antibiotics has important implications; it carries a considerable risk for adverse effects,<sup>1,4</sup> rising costs<sup>8</sup> and development of bacterial resistance against antibiotics.<sup>6</sup> In addition, prescribing antibiotics can have a medicalizing effect.<sup>9</sup> Almost all GPs admit prescribing more antibiotics for respiratory tract infections than recommended in existing guidelines.<sup>6,7,10</sup> Clinical and non-clinical factors such as perceived patient expectations play an important role in the decision of whether or not to prescribe antibiotics.<sup>7,10–19</sup> Approximately 30–70% of patients with upper respiratory tract infections expect antibiotics,<sup>10–12,20–22</sup> depending on, notably, the duration and severity of complaints before consultation,<sup>22,23</sup> past experience<sup>7,20,22</sup> and patients' perception of the

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Received 17 February 2003; Revised 28 October 2003; Accepted 7 January 2004.

Julius Center for Health Sciences and Primary Care, University Medical Center Utrecht, PO Box 85060, 3508 AB Utrecht, The Netherlands; E-mail: i.welschen@med.uu.nl

effectiveness of antibiotics.<sup>22</sup> GPs often assume that prescribing antibiotics will increase patient satisfaction. There are some indications, however, that patient satisfaction is influenced primarily by the amount of time spent by the physician and the information about the disease provided,<sup>7,10,12,24</sup> and not by antibiotic prescription.<sup>7,10,12</sup> The number of studies is, however, very limited, while only one study carried out a multivariate analysis to identify independent determinants of patient satisfaction.<sup>12</sup> In addition, it is not known whether the associations between these determinants and patient satisfaction are modified by patients' characteristics such as expectations regarding antibiotic prescribing. The aim of this study is to determine the associations between receiving antibiotics and information/reassurance on one hand, and patient satisfaction on the other hand, in both patients who expect to receive antibiotics and those who do not.

## Methods

For this study, we used the nationwide network of GP peer review groups. Twelve of the 42 invited peer review groups in the region of Utrecht agreed to participate in an intervention trial concerning respiratory tract infections with antibiotic prescription rates and patient satisfaction as main outcome measures. Claims data showed no differences in volumes of antibiotics prescribed by the participating GPs as compared with the non-participating GPs in the region. During 3 weeks in autumn 2000, 122 GPs registered all patients presenting with acute respiratory tract symptoms (house calls and out-of-hours activity not included) ( $n = 2358$ ). Immediately after the encounter, the GP requested the patient to complete a written questionnaire. The patients' questionnaires were sent directly to the investigators without being shown to the GP. In addition, the questionnaire did not include any information that could reveal the identity of the patient. Parents filled out questionnaires on behalf of children. The questionnaire contained questions addressing patients' expectations and what actually happened during the consultation regarding antibiotic prescriptions and receiving information/reassurance. All item responses were dichotomous (i.e. yes or no). In addition, patients' satisfaction was measured using a 5-point scale (from very dissatisfied = 1 to very satisfied = 5), which was later collapsed conservatively from five categories into the dichotomous variable dissatisfied/satisfied with the consultation (dissatisfied 1–3; satisfied 4–5).

The associations between receiving an antibiotic prescription and receiving information/reassurance on one hand and patients' satisfaction on the other hand were studied primarily by bivariate logistic regression analysis. Multivariate logistic regression analysis, adjusting for the potential confounders 'age' and 'gender', was carried

out to determine whether the formerly mentioned factors were independently associated with patient satisfaction. Separate analyses were performed for patients who expected to receive antibiotics and those who did not. For all analyses, SPSS for Windows (Version 10.0) was used. The Research Ethics Committee of the University Medical Center Utrecht gave their approval for the study.

## Results

The GPs registered 2358 patients with acute respiratory tract symptoms and 1160 patient questionnaires were collected by the investigators; response rate 49%. Mean age of the 1160 patients who returned the patient questionnaire was 33 years (range 0–95) and 57% were female (Table 1). They did not differ much from all patients with acute respiratory tract symptoms registered by the GP regarding age and sex (54% female, mean age 30 years, range 0–95), but they more often received antibiotics (44 versus 30%). Mean satisfaction with the consultation was 4.2 (SD 0.73) on the 1–5 scale. Half of the 1160 patients expected antibiotics (467/926); 73% of them (343/467) actually received them (Table 2). There was no difference in mean satisfaction in those who received antibiotics and those who did not (4.29, SD 0.70; and 4.15, SD 0.74, respectively). Information/reassurance was expected by 90% of the respondents (916/1014), and 97% of them received it (888/916). Patients who did not receive information/reassurance were less satisfied

TABLE 1 Patient characteristics

	Responders ( $n = 1160$ )		All registered patients ( $n = 2358$ )	
	<i>n</i>	(%)	<i>n</i>	(%)
Female	646	(56.5)	1274	(54.3)
Age category				
0–11 years	337	(29.3)	793	(33.6)
12–59 years	617	(53.7)	1242	(52.7)
≥60 years	195	(17.0)	23	(13.7)
Type of symptoms <sup>a,b</sup>				
Earache	299	(34.1)		
Sinusitis-like complaints	717	(73.8)		
Sore throat	477	(54.3)		
Cough	793	(80.0)		
Satisfaction				
Very dissatisfied	13	(1.1)		
Dissatisfied	22	(1.9)		
Not dissatisfied nor satisfied	56	(4.9)		
Satisfied	643	(56.5)		
Very satisfied	405	(35.6)		

<sup>a</sup> More than one answer possible; therefore, the total exceeds 100%.

<sup>b</sup> Results are not comparable because in the registration only one answer was possible.

TABLE 2 *Expectations prior to the encounter and GPs' management (n = 1160)*

		Patients expected antibiotics?		
		Yes (n = 467)	No (n = 459)	Total (n = 926)
GP prescribed antibiotics	Yes	343	66	409
	No	124	393	517

  

		Patients expected information/reassurance?		
		Yes (n = 916)	No (n = 98)	Total (n = 1014)
GP gave information/reassurance	Yes	888	70	958
	No	28	28	56

TABLE 3 *Patients' satisfaction and its associations with patients' expectations and GPs' management*

	All Adjusted OR <sup>a</sup> n = 947	Patients expected to receive antibiotics?	
		Yes Adjusted OR <sup>a</sup> n = 434	No Adjusted OR <sup>a</sup> n = 454
Received antibiotics	2.2 (1.3–3.8)	3.8 (1.9–7.5)	2.4 (0.6–9.8)
Received information/reassurance	10.6 (5.6–20.1)	4.7 (1.9–11.9)	21.6 (7.4–62.7)

Results of multivariate logistic regression models: adjusted odds ratios (ORs) with 95% confidence intervals.

<sup>a</sup> Adjusted for age and gender.

compared with those who did receive information and reassurance (3.57, SD 1.13; and 4.27, SD 0.68, respectively).

Receiving an antibiotic prescription and receiving information/reassurance were both independently associated with patient satisfaction; adjusted odds ratios (ORs) 2.2 [95% confidence interval (CI) 1.3–3.8] and 10.6 (95% CI 5.6–20.1), respectively. The relationship between being prescribed antibiotics and receiving information/reassurance on one hand and patient satisfaction on the other hand was modified by the fact of whether or not patients expected antibiotics. In patients who did not expect antibiotics, receiving information/reassurance was the only independent determinant of satisfaction; adjusted OR 21.6 (95% CI 7.4–62.7). However, in patients who expected an antibiotic prescription, being prescribed antibiotics was as important as receiving information/reassurance,

yielding adjusted ORs of 3.8 (95% CI 1.9–7.5) and 4.7 (95% CI 1.9–11.9), respectively (Table 3).

## Discussion

Almost all patients who visited the GP because of respiratory tract symptoms expected to receive information/reassurance from the GP. The fact of whether or not the GP gave information/reassurance was more strongly associated with patient satisfaction than prescription of antibiotics. These results are in accordance with previous studies.<sup>7,10–12,18,20–22</sup> Nevertheless, we found that the associations were modified by the expectation of an antibiotic prescription. In patients who did not expect an antibiotic, receiving information/reassurance was strongly associated with patient satisfaction. However, in patients who expected an antibiotic, information/reassurance and prescribed antibiotics were equally strong predictors of patient satisfaction.

Some comments should be made. Non-response can be explained partly by the fact that not all patients were given a questionnaire by the GPs. Our experience shows that time constraints during the encounter is the most important reason for this and that this phenomenon occurs more or less randomly. Nevertheless, satisfied patients may be somewhat over-represented in our sample because GPs may have tended to give out questionnaires to patients in whom they expected a high level of satisfaction. Importantly, however, this will not bias the results if there is an over-representation of satisfied patients in both those who were prescribed antibiotics and those who did not receive antibiotics. Bias would only occur if of the patients who received antibiotics those with a high level of satisfaction were more likely to be included, while of those who did not receive an antibiotic prescription those with a lower level of satisfaction were more likely to participate (or vice versa). We think this is highly unlikely.

The results may have been influenced by the fact that patients completed the questionnaire after the consultation had taken place. Thus the reported expectations prior to the consultation may have been influenced by the consultation itself. An alternative design would have been to measure expectations before the consultation took place, but this can also influence expectations because patients might become more aware of possible expectations by filling in a questionnaire. We chose the most pragmatic design in which we could address questions on expectations, management and satisfaction at the same time.

We are aware of the fact that by dichotomizing the outcome, some information could be lost and that, for example, linear regression analysis with patient satisfaction as an ordinal variable could theoretically provide additional information. Since, however, the data showed a skewed distribution, linear regression

was not the best option. In addition, from a clinical point of view, the dichotomizing of satisfaction (yes/no) was relevant. The results of linear regression analysis of the data did not differ from the multivariate logistic regression analysis. For these reasons, a multivariate logistic regression analysis with satisfaction (yes/no) as the dependent variable was performed.

In conclusion, all patients in this study were more satisfied when they received information/reassurance during the encounter for acute respiratory tract symptoms compared with when they did not. GPs should keep in mind that they overestimate the influence of antibiotic prescription on patient satisfaction: most patients just want appropriate information/reassurance regarding their complaints.<sup>7,24</sup> Only in patients expecting antibiotics was prescription of these drugs an independent determinant of patient satisfaction. Therefore, it is suitable to explore patients' expectations<sup>23</sup> and also why patients think that antibiotics are more appropriate. Following patients' expectations and views about antibiotics, GPs can provide accurate information about the self-limiting character of most respiratory tract symptoms<sup>20,21</sup> and the (in)effectiveness of antibiotics<sup>17,20,21,25–27</sup> before making a management decision together with the patient (shared decision making<sup>28</sup>).

## Acknowledgements

We wish to thank the GPs and their patients who participated in this study, our data managers P. Zuithoff and F. Verheij for their help with data processing and the analyses, and Dr C Weijnen for comments on an earlier version of this article. We acknowledge financial support from the Netherlands Organisation for Health Research and Development (Zorg Onderzoek Nederland) project number 2200.0057 and Foundation for the Advancement of Appropriate Prescription Drug Usage in the Central Region of the Netherlands (Stichting Doelmatig Geneesmiddelengebruik Midden Nederland). No conflict of interest.

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