

The influence of antibiotics and other factors on reconsultation for acute lower respiratory tract illness in primary care

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SUMMARY

Background. Antibiotics are prescribed to the majority of patients consulting their general practitioner (GP) for lower respiratory tract illness (LRTi). A common reason for prescription is the belief that antibiotics reduce re-attendance; a motive supported by the high reconsultation rates for this largely self-limiting illness. Information about reconsultation following treatment of LRTi, and the factors that influence it, is scarce.

Aim. To explore factors associated with reconsultation after initial management of LRTi.

Method. Analysis of data collected prospectively during presentation of acute LRTi in primary care.

Results. Seventy-six per cent of 518 patients were prescribed antibiotics, and 30% reconsulted for similar symptoms within the next 28 days (29% of those who were given antibiotics and 33% of those who were not). Forty-one per cent of patients who had seen their GP 15 or more times in the previous two years reconsulted, compared with 13% of those who had made fewer than five visits. Reconsultation was more common in patients with a history of underlying disease (38.6% versus 24.3%) and in patients who reported dyspnoea (41.5% versus 24.3%).

Conclusion. Reconsultation is common in acute LRTi and is associated with a heightened consulting habit prior to the index consultation, the presence of previous ill health, and dyspnoea. It appears not to be influenced by prescribing antibiotics.

Keywords: antibiotics; prescribing; reconsultation; lower respiratory tract illness.

Introduction

LOWER respiratory tract illness (LRTi), including lower respiratory tract infection (LRTI), is a common, incompletely understood symptom complex, usually presenting as a self-limiting condition of mild or moderate severity. The accurate definition of such patients is difficult,¹⁻³ especially in primary care where most patients with LRTi are managed without investigations, where infection is suspected rather than proven, and where organisms are rarely identified.

Although placebo-controlled studies of antibiotics have shown little or no benefit in treating respiratory symptoms either in previously well patients^{4,5} or in those with exacerbations of chronic obstructive pulmonary disease,⁶ few studies have measured repeat GP consultations. This is an important endpoint, as reconsultation rates of between 20% and 28%⁷⁻⁹ within a few weeks of initial management represent a considerable workload for the GP and inconvenience for the patient.

We investigated factors influencing reconsultation in the month following initial management of LRTi in general practice. Our earlier work¹⁰ confirmed the findings of other studies^{11,12} — that diagnostic labels applied to episodes of LRTi by GPs are extremely variable and show little consistency between observers. We therefore chose to study adults presenting with what their GP considered to be an LRTi, where cough was the predominant symptom, and irrespective of whether antibiotics were prescribed.

Method

During the winter of 1994/95, 58 GPs, members of our Community Respiratory Infection Interest Group (CRIIG), contributed to a large observational study in primary care of acute LRTi in adults, documenting an index consultation on purpose-designed data sheets. They recorded consecutive consultations for patients aged 16 and over with an acute LRTi where cough was the predominant symptom. Information, collected in a structured manner, included presenting symptoms and signs, the presence of significant underlying disease (defined as a condition under supervision or therapy), details of any antibiotic prescription and the certainty of the decision to prescribe, the influence of other, non-medical factors on management, and the description of the illness by the GP. These results have been published elsewhere.¹⁰ The GPs of our CRIIG (median age 41 years, range 26–64) provide a representative spectrum with 63% in suburban practices, 23% in inner-city practices, and 14% in rural practices. Seven per cent are single handed.

In the following summer, these GPs agreed to review the medical records of their study patients, first to identify consultations for similar symptoms in the month *after* the index consultation, and secondly to count the number of consultations, for any reason, between these patients and their GP(s) during the two years *before* the index consultation. The former was used to detect reconsultation; the latter provided a measure of consulting behaviour.

We analysed univariate associations with reconsultation by cross-tabulation in SPSS PC version 4.1 and assessed statistical significance using the chi-square test for independence and the chi-square test for trend. The independence of each effect was tested using multiple logistic regression in EGRET (Cytel Software Corporation). Additional adjustment was made for the effect of GP as a 58 level factor in order to establish the independence of these effects from the characteristics of individual GPs. Interactions between each factor and the prescription of antibiotics in determining reconsultation were examined to investigate the possibility of differential effects of prescribing antibiotics in particular subgroups.

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Results

Fifty-eight GPs examined the notes of 518 of the 584 patients they had initially included. Of 66 patients with no follow-up data, 12 had moved from the practice or had been a temporary resident at the time of initial treatment, three had died, four had been incorrectly entered, and the notes for the remaining 47 patients were not traceable during the follow-up period, mostly because of incomplete patient identification data.

One hundred and fifty-four of the 518 study patients (30%) reconsulted within four weeks for similar symptoms. Factors showing an association with patient reconsultation are shown in Table 1. Reconsultation was univariately associated with the number of GP visits recorded in the previous two years, patient age, the presence of significant underlying disease, the symptoms of shortness of breath and wheeze, and the presence of signs on chest examination. Reconsultation was unrelated to patient sex, whether the cough was dry or productive of clear or discoloured sputum, the presence of chest pain, sore throat, fevers, aches and pains, and the description applied to the illness by the GP. We did not record smoking status.

Three hundred and ninety-three patients (76%) had been prescribed antibiotics at the index consultation. Among all the study patients, reconsultation was unrelated to the prescription of antibiotics or the duration of treatment; 29% (113/393) of those prescribed an antibiotic reconsulted within a month, compared with 33% (41/125) of those who were not prescribed an antibiotic ($P = 0.4$).

In multiple logistic regression, the independent determinants of reconsultation were the number of previous GP visits in the previous two years (adjusted odds ratio (OR) of reconsultation for 10 previous visits relative to none = 1.49, 95% Confidence Interval (CI) = 1.21–1.86, $P < 0.001$), shortness of breath at presentation (adjusted OR = 1.79, 95% CI = 1.18–2.72, $P = 0.006$), and a weak but not significant effect due to the presence of underlying disease (adjusted OR = 1.43, 95% CI = 0.94–2.17, $P = 0.09$). After additional adjustment for each GP, there remained significant independent effects related to the number of previous surgery visits (adjusted OR for 10 previous visits = 1.89, 95% CI = 1.41–2.53, $P < 0.001$) and shortness of breath (adjusted OR = 1.70, 95% CI = 1.00–2.89, $P = 0.048$), but there was no further

effect for the presence of underlying disease. After adjustment for all of these variables, there was no independent effect of the prescription of antibiotics upon reconsultation (adjusted OR = 0.94, 95% CI = 0.52–1.71).

Initial presenting features and reconsultation

Of the symptoms present at the index consultation, dyspnoea, wheeze, and signs on chest examination were associated with increased rates of reconsultation. However, dyspnoea was the only independently significant predictor. After adjustment in multiple logistic regression for dyspnoea, there was a reduced effect from the presence of signs on chest examination and no further effect from wheeze, suggesting that these three symptoms are interrelated and dyspnoea is the strongest determinant of patient reconsultation. The majority (84%) of those with shortness of breath at the index consultation were prescribed an antibiotic. There was no significant interaction between antibiotic prescription and shortness of breath in determining reconsultation; the prescription of antibiotics was not associated with a reduction in reconsultation in patients who presented with shortness of breath.

Prior consultation history, underlying disease, and reconsultation

The strongest independent predictor of reconsultation in our data was the number of surgery visits in the previous two years, the trend being highly significant ($P < 0.001$). Forty-one per cent (56/136) of those with 15 or more visits in the previous two years reconsulted, compared with 13% (15/119) for those with fewer than five previous visits. Although those with an underlying disease were more likely to have a history of frequent consultations, and both underlying disease and prior consultation history were univariately associated with reconsultation, consultation history was the stronger and independent predictor of reconsultation. There was no statistically significant interaction between the number of previous visits and antibiotic use in determining reconsultation.

Underlying disease, antibiotic use, and reconsultation

Table 1. Factors significantly associated with patient reconsultation within four weeks.

		Reconsultation			P-value
		Total	Number	%	
Number of visits in the past two years	0–4	119	15	12.6	$P_{\text{trend}} < 0.001$
	5–9	147	42	28.6	
	10–14	114	40	35.1	
	15 or more	136	56	41.2	
Underlying disease	absent	321	78	24.3	$P < 0.001$
	present	197	76	38.6	
Shortness of breath	no	354	86	24.3	$P < 0.001$
	yes	164	68	41.5	
Wheeze	no	382	104	27.2	$P = 0.04$
	yes	136	50	36.8	
Chest examination	Clear	284	72	25.4	$P = 0.009$
	General or focal signs	216	79	36.6	
Patient age	< 30	83	16	19.3	$P_{\text{trend}} = 0.006$
	30–39	85	22	25.9	
	40–49	85	27	31.8	
	50–59	60	17	28.3	
	60–69	97	33	34.0	
	70+	102	38	37.3	

On univariate analysis, there was evidence that reconsultation was increased in patients with underlying disease: 76 of the 197 patients with a history of underlying disease re-attended (38.6%), compared with 78 of the 321 with no such history (24.3%) ($P < 0.001$). There was a weak interaction between underlying disease and antibiotic prescription ($P = 0.1$), such that there was no effect of antibiotic prescription in patients with underlying disease. Conversely, in those patients without a history of underlying disease, the prescription of antibiotics was associated with a significant reduction in reconsultation (OR = 1.79, 95% CI = 1.04–3.06, $P = 0.035$). However, reconsultation in this group was strongly related to the number of visits in the previous two years; after adjustment for this factor, the effect of antibiotic prescription was reduced and was no longer statistically significant (adjusted = OR 1.58, 95% CI = 0.91–2.75, $P = 0.1$).

Antibiotic choice and reconsultation

There were discernible differences on reconsultation rates between the various antibiotics used at the initial consultation. Patients who were prescribed cephalosporins, quinolones, and trimethoprim were the most likely to return, and those prescribed amoxicillin the least likely ($P = 0.004$, Table 2). Although there was a significant relationship between initial antibiotic choice and the presence of underlying disease, with amoxicillin being used less in the presence of underlying disease ($P = 0.001$), when adjusted in multiple logistic regression, the magnitude of the effect of antibiotic type was reduced but still significant ($P = 0.003$).

Discussion

Our findings confirm that a second consultation for the same symptoms is common in LRTi. It affects nearly a third of the patients in this group, which compares with rates of 18% to 23% in other recent studies of LRTi.⁷⁻⁹ Although LRTi is often considered a condition of minor importance, its associated workload and patient discomfort is considerable.¹³

Overall, we found that there was a complex interaction between the various factors associated with reconsultation. Our study has had the power to extract only some of these. The most important factors relating to reconsultation in the month following initial management appear to be the prior health of the patient, his or her consultation habits, and whether the patient was dyspnoeic at the time of consultation.

The effect of antibiotics in LRTi

In previously healthy patients, antibiotics have been shown to have little effect on the natural history of acute LRTi and 'acute bronchitis'.⁴ Although some authorities have stated that antibi-

otics are never or very rarely indicated in this situation,¹⁴ this advice is rarely followed by European GPs¹⁵ (a finding that agrees with those of our earlier study where three quarters of patients received antibiotics at their first consultation;¹⁰ this situation appears to have changed little over the past 25 years.¹⁶

There is a widespread but poorly documented belief among GPs that an antibiotic prescription reduces reconsultation, at least in the short term. In a retrospective study of young patients consulting for acute respiratory illness, Howie and Hutchinson¹⁷ found that 5% of those given antibiotics (33/639) reconsulted compared with 9.2% (20/217) of those who were not ($P = 0.03$ by our calculation).

The only patients for whom we found antibiotics to have an effect on reconsultation were those who were previously healthy — a surprising finding that may be spurious as its statistical significance was lost when adjusted in MLR (multiple logistic regression) for the number of previous visits. Previously healthy patients in this group who did re-attend consulted more often in the previous two years than those who did not.

Most GPs are aware that it is appropriate to prescribe fewer antibiotics for acute LRTi. The potential for reducing such prescribing was shown in our earlier study,¹⁰ which demonstrated that in 20% of episodes of acute LRTi antibiotics were prescribed even when the prescribing GP thought they were 'probably not indicated' or 'definitely not indicated'. However, the circumstances of many consultations for LRTi — busy surgeries, unplanned, urgent consultations, and high patient expectation of medication — are hurdles to prescribing fewer inappropriate courses of antibiotics. Overuse of antibiotics encourages patients to associate the natural improvement in their symptoms with the prescription of medication and encourages future consultation.¹⁹

The availability of modern antibiotics has not reduced the rate of reattendance for this condition. Indeed, we found a striking association between initial antibiotic choice and reconsultation. Patients receiving newer antibiotics returned more frequently: an effect not simply explained by the use of these antibiotics in patients with significant underlying disease. It has been suggested that using newer or more broad spectrum antibiotics in those with underlying disease is appropriate;¹⁸ we found no evidence to support it.

Why do patients reconsult?

Patients consult and reconsult for a variety of reasons that reflect disease as well as temperament and circumstance. We speculate that some patients return to their GP because of unrealistic expectations of the resolution of their symptoms, a heightened consulting habit, and, in those who did not initially receive antibiotics, concern about the lack of 'treatment'. We did not assess compliance with any therapy prescribed at the index consultation. It is possible that poor compliance may lead to persistent symptoms prompting reconsultation; however, in this study, antibiotics were prescribed at reconsultation to less than half of the patients, suggesting that the GPs did not feel persisting infection to be a major concern.

The influence of prior consulting behaviour on reconsultation is credible and appears to have an independent effect. We had limited data with which to study the independence of prior consultation behaviour from factors related to the individual GPs; after adjusting for each GP, the adjusted odds ratio for this relationship was 1.44, still pointing to a real effect but with loss of power and statistical significance. A much larger sample would be needed to adjust for 58 (GP) variables in this way. Consulting habit is clearly an important influence, and it would seem prudent that studies examining the influence of medication in LRTi should control for this variable in their analysis.

Table 2. Patient reconsultation within four weeks according to the type of antibiotic prescribed.

Antibiotic	Reconsultation	
	Total	Number %
Beta lactam (such as amoxicillin)	233	57 24.5
Macrolide	59	16 27.1
Co-amoxycylav	40	10 25.0
Cephalosporin	25	14 56.0
Tetracycline	22	7 31.8
Quinolones	10	7 70.0
Sulphonamide and/or trimethoprim	3	2 66.7

Conclusion

Reconsultation is a common outcome in acute LRTi and is associated with the presence of previous ill health, dyspnoea, and a heightened consulting habit. It appears not to be influenced by prescribing antibiotics.

Perhaps the most effective tool to improve management is better information for patients and doctors. Further studies to define the natural history of LRTi and to establish the role of antibiotics in their management will help GPs to be more confident in reducing unnecessary prescription, and to be enthusiastic in educating patients of the rate of improvement they can reasonably expect.

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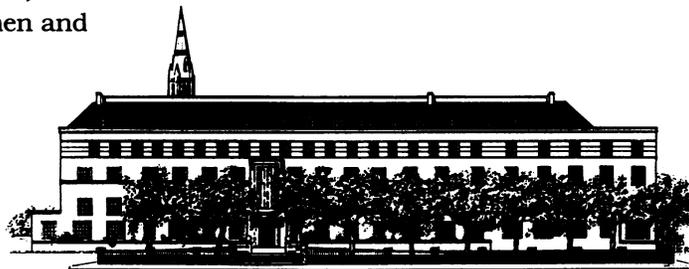


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