

Inappropriate use of antibiotics for acute respiratory tract infections in a rural emergency department

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Introduction: Evidence-based reviews and guidelines recommend lowering antibiotic prescription rates for acute respiratory tract infections (ARIs).
Objective: To determine the number of patients presenting with uncomplicated ARIs at the walk-in emergency department (ED) of a rural community health centre and to determine the antibiotic prescription rate for each type of ARI.
Methods: A one-year retrospective data collection of a rural ED was carried out using MEDITECH and chart review to determine numbers of patients presenting with an ARI; antibiotic prescriptions were recorded according to ARI diagnosis.
Results: ARIs accounted for 22% of all patients seen by the ED doctor. In 57% of the ARIs diagnosed, patients were prescribed an antibiotic. Individual rates ranged from 2% for influenza to 100% for pneumonia. A breakdown of rates for each type of ARI is provided.
Conclusions: Antibiotic prescription rates for ARIs remain high, with some ARIs being more inappropriately managed than others. The rate of patients presenting with ARIs to the study ED was higher than in some other EDs, possibly reflecting the problems of recruiting and retaining family doctors in many rural areas, including ours.

Introduction : Les analyses critiques et lignes directrices factuelles recommandent de réduire les taux de prescription d'antibiotiques contre les infections aiguës des voies respiratoires (IAR).
Objectif : Déterminer le nombre de patients qui se présentent avec une IAR sans complication à l'urgence sans rendez-vous d'un centre de santé communautaire rural et déterminer le taux de prescription d'antibiotiques pour chaque type d'IAR.
Méthodes : On a recueilli pendant un an des données rétrospectives d'un service d'urgence rural au moyen de MEDITECH et en procédant à une étude de dossiers pour déterminer le nombre de patients qui se sont présentés avec une IAR. On a consigné les ordonnances pour des antibiotiques en fonction des IAR diagnostiquées.
Résultats : Parmi tous les patients reçus par le médecin à l'urgence, 22 % avaient une IAR. Dans 57 % des cas d'IAR diagnostiquée, on a prescrit un antibiotique aux patients. Les taux individuels ont varié de 2 % dans le cas de la grippe à 100 % dans celui de la pneumonie. On présente une ventilation des taux pour chaque type d'IAR.
Conclusions : Les taux de prescription d'antibiotiques dans les cas d'IAR demeurent élevés et certaines IAR sont moins bien prises en charge que d'autres. Le taux de patients qui se sont présentés avec une IAR au service d'urgence à l'étude a été plus élevé qu'à d'autres services d'urgence, ce qui reflète peut-être les problèmes posés par le recrutement et le maintien en poste des médecins de famille dans beaucoup de régions rurales, y compris la nôtre.

INTRODUCTION

Throughout the world, a large part of the family doctor's work is the diagnosis and management of acute respiratory tract infections (ARIs). Depending on the season and the type of practice, these infections make up 20% to 25% of a family doctor's out-patient work.[1–3] Infections such as colds, sinusitis, bronchitis and influenza are almost always caused by viruses, and infections such as otitis media and pharyngitis (which are sometimes due to bacterial infection) will often recover spontaneously without antibiotics. Nevertheless, it has been

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amply documented that family doctors in most developed countries have high rates of antibiotic prescribing for these conditions.[4–6]

Evidence-based reviews and guidelines (Box 1) recommend less use of antibiotic treatment for ARIs, not only because the antibiotics are ineffective, but because their widespread use is thought to contribute to the development of antibiotic resistance in community bacteria.[7] There has been a recent trend of reduced antibiotic prescribing in the US[8] and the UK.[9] However, prescribing rates are still high, especially for infections in children, and in some countries the rate has actually increased.[10] Prescribing rates in a rural emergency department (ED) in Canada have recently been shown to be very high for children.[11]

In the current study, a 1-year audit of a rural walk-in ED was undertaken to determine the number of patients (all ages) presenting with ARIs and the antibiotic prescribing rate for those patients.

Methods

The Newhook Community Health Centre serves a rural population of approximately 15 000. It provides 24-hour walk-in access to a small ED, with one doctor covering each on-call shift. Retrospective data were collected on all visits to the ED for a 1-year period (September 2002 to August 2003), using both the MEDITECH system (Medical Information Technology, Inc., Westwood, Mass.) and careful examination of handwritten charts.

Patients presenting with ARI symptoms of less than 1-week duration were included in the study, as were all patients with an exit diagnosis of common cold (including croup and laryngitis), viral upper respiratory tract infection, acute otitis media, acute pharyngitis, acute bronchitis (including bronchiolitis in children), acute sinusitis, influenza and pneumonia. In each case, prescriptions were reviewed and prescribed antibiotics were recorded according to ARI diagnosis. Only when an uncomplicated ARI was present (i.e., no underlying complication such as asthma, chronic bronchitis, severe cardiorespiratory disease, or compromised immune status) was the patient eligible for inclusion into this study.

The doctor on-call list for the period of the study was also reviewed, and the number of different doctors covering the ED over the study period was recorded.

Results

There were 8682 visits to the ED. Of these, 971 patients came for dressings, injections and conditions managed exclusively by the ED nurses. The remaining 7711 patients were seen by the on-call doctor. A diagnosis of one or more of the ARIs was made in 1730 patients, accounting for 22% of all patients seen by the ED doctor.

As shown in Table 1, an antibiotic was prescribed in 999 cases (57% of the diagnosed ARIs). Also shown is the number of antibiotics prescribed for each type of ARI, which ranged from 2% for influenza to 100% for acute pneumonia.

A total of 29 different doctors worked in the ED during the study year. A brief review of the prescribing rates for ARIs varied from 10%–88%; those doctors who were "high prescribers" had a higher rate of antibiotic prescription for all conditions. The most notable behaviour was of one physician, who was responsible for 36 of 68 (53%) diagnoses of "pneumonia."

Box 1. Evidence-based information on antibiotics and acute respiratory tract infections

Most family doctors would probably agree that antibiotics are needed for pneumonia and not needed for influenza. For other acute respiratory infections, antibiotics may or may not be needed. We use the following evidence-based resources to determine the most appropriate pattern of practice.

The Cochrane Library, Issue 1, 2003. Oxford; Update Software

- Arroll B, Kenealy T. Antibiotics for the common cold.
- Del Mar C, Glasziou P, Spinks AB. Antibiotics for sore throat.
- Glasziou P, Del Mar C, Sanders L. Antibiotics for acute OM in children.
- Williams JW, Aguilar C, Makela M. Antibiotics for acute sinusitis.

Alberta Clinical Guidelines Program (www.albertadoctors.org)

- Diagnosis and Management of Croup
- Diagnosis and Treatment of Acute Pharyngitis
- Diagnosis and Treatment of AOM in Children
- Management and Treatment of Acute Bronchitis
- Diagnosis and Management of Acute Bacterial Sinusitis

Discussion

Our retrospective audit revealed that family doctors are probably still prescribing far too many antibiotics for ARIs. Antibiotic prescription rates varied widely depending on the diagnosis; antibiotics were rarely prescribed when influenza was diagnosed (2%) and always prescribed when pneumonia was diagnosed (100%). There was also evidence of "diagnostic labelling"[12] — the phenomenon of doctors who pick a suitable name for the condition after they have decided to prescribe an antibiotic. This likely accounts for over half the diagnoses of "pneumonia" that were made by one physician. Particularly worrying, however, are the antibiotic prescribing rates found for acute sinusitis (82%) and acute bronchitis (73%); both rates were high despite the fact that these are predominantly viral infections unaffected by antibiotics. Other rates also appeared high. The prescribing rate for acute pharyngitis was 84%, even though antibiotics would normally only be indicated for those with acute streptococcal infections — usually about 30% of children and 10% of adults.[13] The 90% prescribing rate for otitis media also appears unwarranted; although otitis media is usually caused by a bacterial infection, most children improve spontaneously.[14]

Our audit also revealed that ARIs accounted for 22% of ED visits. Large studies of patients attending EDs have found that ARIs usually account for 10%–15% of ED visits. The high rate of patients who presented with ARI in the current study is likely due to the difficulties encountered in recruiting and retaining family doctors for our rural area. Many people do not have a family doctor and use the ED as their source of primary care. Although EDs can and do provide primary care, these ED visits do not provide continuity of care — no fewer than 29 different doctors worked at the site during one year! The 29 doctors ranged from 30-year family practice veterans, to recent medical school graduates moonlighting from residencies in psychiatry and radiology.

Steps must be taken to affect more appropriate antibiotic prescribing rates. Group discussions on the management of ARIs and the use of simple evidence-based protocols, such as the sore throat score developed by McIsaac and colleagues[15] and those produced by the Alberta Medical Association,[16] are currently underway.

Table 1. Acute respiratory tract infection diagnoses (*n* = 1662) and proportions of antibiotic use at a rural community health centre emergency department, Sept. 1, 2002, to Aug. 31, 2003

Diagnosis	No. of patients	No. of patients prescribed an antibiotic (and % of total)
Upper respiratory tract infection (including croup)	683	178 (26)
Influenza	109	2 (2)
Otitis media	277	250 (90)
Acute pharyngitis	377	316 (84)
Acute sinusitis	76	62 (82)
Acute bronchitis (including bronchiolitis)	168	123 (73)
Pneumonia	68	68 (100)
Totals	1758*	999 (57)

*Diagnosis total is higher than patient total because 28 patients were given the diagnosis of 2 simultaneous acute respiratory tract infections.

Competing interests: None declared.

Key words: rural, emergency department, acute respiratory tract infections, antibiotics

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