



Medicines Evidence Commentary

commentary on important new evidence from Medicines Awareness Weekly

Published: April 2019

Respiratory tract infections: UK study finds prescribing feedback and decision support tools reduced antibiotic prescribing in primary care

A UK cluster randomised controlled trial found that a computer-based antimicrobial stewardship (AMS) intervention that provided brief training, prescribing feedback and decision support tools reduced antibiotic prescribing for self-limiting respiratory tract infections, and did not increase complication rates. GP practices who received the AMS intervention prescribed 98.7 antibiotic prescriptions for respiratory tract infections per 1,000 person years, compared with 107.6 antibiotic prescriptions in the control practices. Antibiotic prescribing was reduced most in people aged 15 to 84 years, with 1 antibiotic prescription per year being avoided for every 62 patients in this age range registered in a GP practice. This new study is an example of how feedback and education can be delivered across a wide area to support the national antimicrobial stewardship agenda, as discussed in the NICE guideline on [systems and processes for effective antimicrobial medicine use](#).

Overview and current advice

Every year, most people will develop an acute respiratory tract infection (for example, a sore throat, cough or common cold; [NICE guideline: respiratory tract infections \[self-limiting\]](#)). Acute respiratory tract infections are generally caused by viruses, and for most people antibiotic treatment has little to no effect on symptom severity or duration. Antibiotics may cause side effects, including nausea and diarrhoea.

NICE has published several [antimicrobial prescribing guidelines](#) on self-limiting respiratory tract infections, advocating a no or [back-up](#) antibiotic strategy for most people. For more detailed guidance see the NICE antimicrobial prescribing guidelines on:

- [Cough \(acute\)](#)
- [Otitis media \(acute\)](#)
- [Sore throat \(acute\)](#)
- [Sinusitis \(acute\)](#).

In addition to potentially harming an individual person, the overuse of antibiotics can lead to antimicrobial resistance, threatening the effective treatment of infections in the future. Antimicrobial stewardship (AMS) is an organisational or healthcare-system-wide approach to promoting and monitoring judicious use of antimicrobials to preserve their future effectiveness. NICE has published 2 guidelines on AMS, covering [systems and processes for effective antimicrobial medicine use](#) and

[changing risk-related behaviours in the general population](#). The [TARGET Antibiotic Toolkit](#), hosted by the Royal College of General Practitioners, provides resources and tools that can each be used to support prescribers' and patients' responsible antibiotic use.

New evidence

A UK-based, open-label, cluster randomised controlled trial (RCT) investigated whether a computer-based AMS intervention could safely reduce antibiotic prescribing for self-limiting respiratory tract infections in primary care ([Gulliford et al. 2019](#)).

The cluster RCT included 79 GP practices that contributed data to the UK [Clinical Practice Research Datalink](#) (CPRD) database. Study follow-up was 12 months. The GP practices provided data on 623,648 individual patients, with 582,675 person years of follow-up.

The AMS intervention consisted of 3 elements:

1. A 6-minute, pre-recorded webinar, introducing the project and providing brief training.
2. Monthly email antibiotic prescribing reports (using CPRD data).
3. Decision support tools, deployed into existing practice software, providing:
 - a. Patient information leaflets
 - b. Advice on appropriate indications for antibiotics.

Practices were randomised to either the AMS intervention (41 GP practices; 323,155 person years of follow-up) or usual care (38 GP practices; 259,520 person years of follow-up).

The primary efficacy outcome was rate of antibiotic prescribing for respiratory tract infections per 1,000 person years over 12 months. The antibiotic prescribing rate was significantly lower in the AMS intervention group (98.7 prescriptions per 1,000 person years) compared with the usual care group (107.6 prescriptions per 1,000 person years), adjusted rate ratio (RR) 0.88 (95% [confidence interval](#) [CI] 0.78 to 0.99, $p=0.04$).

A pre-planned subgroup analysis found the effectiveness of the AMS intervention was age-dependent. The rate of antibiotic prescribing was not significantly reduced in children aged under 15 years (RR 0.96, 95% CI 0.82 to 1.12) or in older people aged 85 years and over (RR 0.97, 95% CI 0.79 to 1.18). Approximately 20% of patients registered at the study GP practices were aged under 15 years or 85 years and over.

There was no statistically significant difference between the AMS intervention and the usual care groups for any of the following secondary efficacy outcomes:

- consultation rate for self-limiting respiratory tract infections
- proportion of consultations for respiratory tract infections with antibiotics prescribed
- antibiotic prescribing for all indications.

The AMS intervention did not significantly increase the number of serious bacterial complications (including pneumonia, peritonsillar abscess and septicaemia) compared with usual care (RR 0.92, 95% CI 0.74 to 1.13).

Commentary provided by NICE

The authors estimate that the AMS intervention resulted in 1 antibiotic prescription being avoided per year for every 62 patients registered in a GP practice aged between 15 and 84 years. The AMS intervention was computer-based and relatively low cost - the authors reported that the research and intervention was delivered for less than £1 per patient year.

Reducing antibiotic prescribing was not associated with an increase in serious bacterial complications. It should be noted that the study was not designed to investigate safety. Given the rarity of such complications in the UK, a considerably larger study would be needed to provide conclusive evidence on the safety of reducing antibiotic use. In addition to this, the study did not report on the impact of the AMS intervention on antimicrobial resistance.

An interesting result of this study is that the AMS intervention did not reduce antibiotic prescribing in people aged less than 15 years and over 84 years. The authors suggested that antibiotic prescribing for the youngest and oldest might be the most difficult to modify, possibly because of safety concerns around withholding antibiotics.

The study follow-up was 12 months only, so the impact of the AMS intervention beyond this point is not known. Respiratory tract infections are generally seasonal, and a longer study may show the impact of the AMS intervention on consultation rates. Previous evidence considered in the [NICE guideline: respiratory tract infections \[self-limiting\]](#) has shown that people who did not receive an antibiotic for their last respiratory tract infection may be less likely to visit their doctor when they have similar symptoms in the future.

This new study supports the NICE guideline on [antimicrobial stewardship: systems and processes](#), that recommends AMS programmes can include:

- monitoring and evaluating antimicrobial prescribing and how this relates to local resistance patterns
- providing regular feedback to prescribers
- providing education and training to practitioners about antimicrobial stewardship and antimicrobial resistance
- integrating audit into existing quality improvement programmes.

Study sponsorship

This cluster RCT was funded by the National Institute for Health Research (NIHR) Health Technology Assessment Programme.

References

Gulliford MC, Prevost AT, Charlton J et al. (2019) [Effectiveness and safety of electronically delivered prescribing feedback and decision support on antibiotic use for respiratory illness in primary care: REDUCE cluster randomised trial](#). *BMJ*; 364:l236

About this Medicines Evidence Commentary

Medicines Evidence Commentaries form part of [NICE's Medicines Awareness Service](#) and help contextualise important new evidence, highlighting areas that could signal a change in clinical practice. They do not constitute formal NICE guidance. The opinions of contributors do not necessarily reflect the views of NICE.

[Visit Evidence Search](#)

Copyright © NICE 2019. All rights reserved. Subject to [Notice of rights](#).