



The recent report from the chief medical officer placed the issue of antibiotic resistance and antimicrobial stewardship centre stage.<sup>1</sup> Primary care is responsible for the majority of non-veterinary antibiotic use which in turn is linked to resistance, so it is a highly appropriate theme running through this month's issue of the *BJGP* and a good time to reflect on how to make changes in practice.

Each year about one-quarter of the population will visit their GP with an acute respiratory infection (ARI) accounting for 60% of antibiotics prescribed in primary care. Targeting antibiotic prescribing for ARI is a good place to start and there are two potential ways to tackle this problem. First by intervening in the population prior to presentation and secondly by addressing prescribing in the consultation.

#### POPULATION INTERVENTION

The majority of acute respiratory illness is self-limiting and so encouraging self-management in the community will reduce the opportunity for unnecessary prescribing. A study in this issue found around one-fifth of responders suffering from an ARI in the UK will present to their GP,<sup>2</sup> a figure which seems consistent with earlier estimates. Consultations are associated with illness severity, failure of self-treatment, worry about more severe illness, and the involvement of children.<sup>2,3</sup> Hence self-care advice, better access to information on the expected natural history, and effective over-the-counter symptom relief may all influence the decision to consult. Providing self-help intervention leaflets prior to the consultation although appealing, probably

at best has a small effect and results of trials are inconsistent.<sup>4,5</sup> More interactive advice delivered through the internet is currently being evaluated.

#### CONSULTATION INTERVENTION

Interventions during the consultation are also important, since more than half of those attending their GP report expecting an antibiotic.<sup>2</sup> Several options are available including GP and patient education, clinical scores, near-patient testing, and a delayed prescription.

One-third of children presenting to their GP with febrile illness are likely to receive an antibiotic prescription and while severity of the illness at presentation appears to influence prescribing, it only explains a small part of the variation.<sup>6</sup> We need to better understand the other factors involved in the prescribing decision since they may be responsive to intervention. This idea is explored further in a systematic review of interventions to reduce antibiotic prescribing for children:<sup>7</sup> interventions targeted only at parents had no effect while those involving both parents and prescribers had the greatest effect. The most effective intervention involved using an interactive booklet during the consultation.<sup>8</sup> Interventions aimed at GPs alone had inconsistent findings. The evaluation of a 2-day structured education intervention shows a small long-term effect on antibiotic prescribing, with a greater effect observed in the subgroup receiving a problem-solving intervention in addition to this.<sup>9</sup> The investment of time in this study (2 or 3 days) was considerable for a small effect and an educational intervention targeted specifically at communication skills has shown a much greater effect on antibiotic prescribing rates.<sup>10</sup> The literature on implementation predicts a minimal effect of information alone, with greater benefit from interactive interventions or

educational outreach.<sup>11</sup> There is a problem with scaling up intensive educational interventions, although these latter findings have been replicated using an internet-based training package (M Moore, unpublished data, 2013).

Although the average effect of antibiotics is marginal there may be important subgroups either likely to benefit more from a prescription or at greater risk of significant complications. Clinical scores may be of benefit, for instance in acute sore throat the Centor criteria can be used to predict Streptococcal group A carriage, and the criteria to guide antibiotic use is endorsed in the NICE guideline. Near-patient tests may also be used to target antibiotics to those at greatest risk; for instance a streptococcal antigen test in acute sore throat. Both these tests and existing clinical scores suffer the same disadvantage in that they are specific for group A streptococcal infection. Streptococcus groups C and G will not be detected although they are likely to be associated with a similar clinical illness.<sup>12,13</sup> It is not clear currently to what extent incorporating scores and/or tests into clinical practice will influence prescribing and outcomes. In lower respiratory tract infection the C-reactive protein (CRP) is a potential candidate for near-patient testing and has been shown to add discriminatory ability for a detailed clinical assessment alone to detect pneumonia. In addition, there is evidence supporting its use to target antibiotics and hence reduce antibiotic prescribing. The CRP test is used routinely in Scandinavian countries providing an opportunity to assess the effect on clinical management and cost-effectiveness in practice.<sup>14</sup> Use of the test was more likely in those who were more unwell at presentation and with more comorbidities: controlling for baseline imbalance the results showed a non-significant reduction in antibiotic

---

*"Each year about one-quarter of the population will visit their GP with an acute respiratory infection ... which in turn accounts for 60% of antibiotics prescribed."*

---

use, no significant difference in clinical outcomes, an increase in investigation but a reduction in hospital admission. Overall cost-benefit analysis suggests a cost of €112 per antibiotic prescription averted and a cost per QALY gain of €9391. Whether CRP is integrated into clinical care in other countries is likely to depend on the outcome both of further trials and setting specific drivers for implementation. In the UK, for instance, where costs of near-patient tests would potentially be met from practitioner pay it seems unlikely to achieve wide implementation unless backed by financial support from commissioning groups or central funds.

### DELAYED PRESCRIPTION

The alternative approach to consultation management is the delayed prescription strategy endorsed by NICE and backed by evidence from studies in sore throat, acute otitis media, and acute lower respiratory tract infection. An updated Cochrane review published this year<sup>15</sup> reported no difference between delayed prescription and no prescription of antibiotics for patient outcomes or satisfaction.

No significant difference in complication rates between delayed or no prescription strategies were observed but since complications are uncommon the combined studies may still have been underpowered to detect a difference in rare outcomes. Since no antibiotic prescription resulted in the lowest antibiotic use it was suggested that this would be the optimum strategy. This may be the case when patients are seeking reassurance rather than an antibiotic. However both strategies will result in reduced antibiotic uptake and given that some GPs may struggle to change from high prescribing strategy to no prescribing and some patients have a high expectation for a prescription I still believe a delayed prescription has a place in the consultation.

### TIME TO ACT

Practices should use prescribing data supplied by local pharmaceutical advisors and practice audit to prompt reflection on current prescribing in acute respiratory illness. Learning to use the delayed prescription approach would result in a substantial fall in antibiotic consumption. There is also good evidence to support

### ADDRESS FOR CORRESPONDENCE

#### Michael Moore

University of Southampton, Primary Medical Care, Aldermoor Health Centre, Southampton, SO16 5ST, UK.

E-mail: [mvm198@soton.ac.uk](mailto:mvm198@soton.ac.uk)

training in communication skills and the use of interactive leaflets in the consultation.<sup>8</sup> The use of near-patient tests to target prescriptions in ARI has potential to reduce prescribing and may be cost effective but the case is yet to be proved. The RCGP website provides a resource for practices with sample audits, patient leaflets to support delayed prescribing, and links to training and other published studies.<sup>10</sup>

#### Michael Moore,

Reader, RCGP National Clinical Champion for Antimicrobial Stewardship and Academic Lead, Primary Care Research Network South West, Aldermoor Health Centre, Southampton.

#### Provenance

Commissioned; not externally peer reviewed.

DOI: 10.3399/bjgp13X668447

### REFERENCES

- Annual Report of the Chief Medical Officer. *Infections and the rise of antimicrobial resistance*. London: Department of Health, 2013.
- McNulty CAM, Nichols T, French DP, *et al*. Expectations for consultations and antibiotics for respiratory tract infection in primary care: the RTI clinical iceberg. *Br J Gen Pract* 2013; DOI: 10.3399/bjgp13X669149.
- Banks I. Self care of minor ailments: a survey of consumer and healthcare professional beliefs and behaviour. *SelfCare* 2010; **1**: 1–13.
- Little P, Somerville J, Williamson I, *et al*. Randomised controlled trial of self management leaflets and booklets for minor illness provided by post. *BMJ* 2001; **322(7296)**: 1214–1216.
- Heaney D, Wyke S, Wilson P, *et al*. Assessment of impact of information booklets on use of healthcare services: randomised controlled trial. *BMJ* 2001; **322(7296)**: 1218–1221.
- Elshout G, van Ierland Y, Bohnen AM, *et al*. Alarm signs and antibiotic prescription in febrile children in primary care: an observational cohort study. *Br J Gen Pract* 2013; DOI: 10.3399/bjgp13X669158.
- Vodicka TA, Thompson M, Lucas P, *et al*. Reducing antibiotic prescribing for children with respiratory tract infections in primary care: a systematic review. *Br J Gen Pract* 2013; DOI: 10.3399/bjgp13X669167.
- Francis N, Hood K, Simpson S, *et al*. The effect of using an interactive booklet on childhood respiratory tract infections in consultations: study protocol for a cluster randomised controlled trial in primary care. *BMC Fam Pract* 2008; **9**: 23.
- Le Corvoisier P, Renard V, Roudot-Thoraval F, *et al*. Long-term effects of an educational seminar on antibiotic prescribing by GPs: a randomised controlled trial. *Br J Gen Pract* 2013; DOI: 10.3399/bjgp13X669176.
- Cals JW, Butler CC, Hopstaken RM, *et al*. Effect of point of care testing for C reactive protein and training in communication skills on antibiotic use in lower respiratory tract infections: cluster randomised trial. *BMJ* 2009; **338**: b1374.
- Grol R, Grimshaw J. From best evidence to best practice: effective implementation of change in patients' care. *Lancet* 2003; **362(9391)**: 1225–1230.
- Little P, Hobbs FR, Mant D, *et al*. Incidence and clinical variables associated with streptococcal throat infections: a prospective diagnostic cohort study. *Br J Gen Pract* 2012; DOI: 10.3399/bjgp12X658322.
- Lindbaek M, Hoiby EA, Lermark G, *et al*. Clinical symptoms and signs in sore throat patients with large colony variant beta-haemolytic streptococci groups C or G versus group A. *Br J Gen Pract* 2005; **55(517)**: 615–619.
- Opong R, Jit M, Smith RD, *et al*. Cost-effectiveness of point of care C-reactive protein testing to inform antibiotic prescribing decisions. *Br J Gen Pract* 2013; DOI: 10.3399/bjgp13X669185.
- Spurling GK, Del Mar CB, Dooley L, *et al*. Delayed antibiotics for respiratory infections. *Cochrane Database Syst Rev* 2013; **4**: CD004417.
- Royal College of General Practitioners. TARGET Antibiotics toolkit. <http://www.rcgp.org.uk/targetantibiotics/> [accessed 6 Jun 2013].