The NICE guideline on the diagnosis and management of community- and hospital-acquired pneumonia recommends point of care measurement of C-reactive protein (CRP) to guide antibiotic prescribing in primary care for patients who present with lower respiratory tract symptoms but in whom a clinical diagnosis of pneumonia is not made. When CRP is <20 mg/L, an antibiotic is not indicated. At a level of 20–100mg/L, a delayed prescription for an antibiotic should be considered. An antibiotic should be offered when CRP is >100mg/L.

This simple strategy is cost effective and, perhaps far more importantly in the long term, could reduce antibiotic prescribing in primary care by around 40 per cent, or 10 million prescriptions, according to Straight to the Point. Ensuring the rational use of antibiotics in primary care using C-reactive protein testing.

As NICE noted, “point-of-care CRP testing in primary care would require a significant focus on key infrastructural and clinical requirements for high-quality care”. Straight to the Point, a consensus report by pharmacists, nurses, physicians and an expert in diagnostic technology, commissioned by point-of-care diagnostics manufacturer Alere International, sets out how this can be delivered with recommendations for clinicians, commissioners and policy makers.

CRP is a widely used inflammation marker, with blood levels higher in patients with a potentially serious bacterial infection than in those with viral or self-limiting bacterial infections

Resistance and prescribing

If antimicrobial resistance has not yet reached apocalyptic levels in primary care, warnings about it certainly have; in the report, Chief Medical Officer Dame Sally Davies compared its impact with climate change and international terrorism. There’s no doubt that inappropriate antibiotic use drives resistance and GP prescribing is a major contributor. Primary care accounts for 79 per cent of prescribing; antibiotic use increased by four per cent between 2010 and 2013; and GPs were 40 per cent more likely to prescribe an antibiotic for coughs and colds in 2011 than in 1999.

Antimicrobial stewardship and infection control strategies have greatly reduced the prevalence of complications due to MRSA and cases of Clostridium difficile in hospitals, but the advent of desktop technology that “resolves
diagnostic uncertainty and, therefore, can help GPs prescribe antibiotics where appropriate and, importantly, justify the reason to patients” is potentially another valuable step.

CRP measurement
CRP is a widely used marker of inflammation. Produced by the liver, it binds to phosphocholine on bacterial and fungal polysaccharides and cell membranes, facilitating immunological recognition of pathogens and damaged cells. Blood levels are higher in patients with a potentially serious bacterial infection than in those with viral or self-limiting bacterial infections. Combined with a clinical assessment, its measurement helps to discriminate between patients with a low or high risk of severe lower respiratory tract infection.

The report cites evidence from studies in Europe that using a threshold CRP level of <20mg/L to identify a patient at low risk reduced antibiotic prescribing from about 50 per cent to 30–40 per cent. A Cochrane review also concluded that denying an antibiotic on the basis of the CRP measurement had no effect on clinical recovery compared with standard care.

It is also interesting (if somewhat unscientific) to learn that the 11 countries in Europe with the lowest per capita antibiotic prescribing are all, to some extent, users of point of care CRP; the UK ranks 12th. It is as if the NHS has done well with antibiotic stewardship but could take a step up if it adopted point-of-care CRP testing.

Patient education
GPs cite patient demand as a major driver of antibiotic prescribing. Point-of-care CRP testing could help to reassure patients that they do not need a prescription, the report suggests, citing studies showing that the test is as effective as enhanced communication skills at reducing prescribing from over 50 per cent to around 30 per cent. Put the two together and antibiotic prescribing can be reduced from 61 to 23 per cent of patients, without sacrificing patient satisfaction. Surveys of patients suggest they are receptive to CRP measurement and are less likely to have their delayed prescription dispensed as a result. On the other hand, some GPs worry that patients may demand CRP measurements when it is not clinically indicated.

Costs
In its cost-effectiveness analysis, NICE estimated that a CRP test would cost £12–£15. Considering subsequent resource use (admission and reconsultation) and the reduced cost of antibiotics, the absolute cost per patient is higher with CRP testing than with standard care (£35.16 vs £16.24). Taking account of the quality of life gain associated with testing, NICE concluded that CRP measurement is cost effective, with a cost per QALY gained of £15,763 compared with standard care.

Although the NICE economic model is the one that the NHS must live with, the report details another analysis using a different cost utility outcome (net monetary benefit, NMB). This found that point of care testing by a GP or a nurse offers reduced use of antibiotics with a minimal increase in NMB (£27–£33 per 100 patients over a three-year period).

Policy
The report is on stronger ground when it aligns CRP testing with the aims of the UK Antimicrobial Resistance Strategy and NHS incentives for CCGs to improve GP prescribing. First, however, testing has to be funded and this would most likely be achieved by creative commissioning of enhanced services and new collaborations between primary and secondary care. This could involve local or trust-wide procurement of the technology, quality assurance and support necessary to implement testing, or a mix in which GPs pay for the technology, support is provided by secondary care and training is provided by the diagnostics manufacturer. A private provider is a further option, either alone or in partnership with secondary care. Point-of-care testing by community pharmacists is already feasible and this model could be extended to prescribing antibiotics under a patient group direction.

Conclusion
Point-of-care CRP testing can reduce antibiotic prescribing for lower respiratory tract infections with no impact on patients. This alone is sufficient reason to consider how, and how soon, it can be implemented in primary care. Investment in technology, training and support will be an obstacle for CCGs and this may require partnerships with agencies outside the NHS. Once this is achieved, testing is cost effective compared with current practice and should be encouraged.

References

Declaration of interests
None to declare.

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