Antibiotic prescribing — a microbiology-pharmacy review

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Pharmacists are becoming increasingly involved in monitoring antibiotic prescribing. This article describes a pilot study at Ipswich Hospital NHS Trust designed to increase clinical pharmacists' contribution to patients on antimicrobial treatment. The study involved pharmacists identifying and reviewing patients as a joint initiative with the microbiology department

Mark Cheeseman, senior clinical pharmacist, discussing recommendations with the referring pharmacist, Tina Islam, senior clinical pharmacist

Prudent antibiotic prescribing was a need highlighted in "Winning ways", published by the Department of Health in 2003.[1] This document described a number of recommendations to implement such prescribing. Around the same time, £12m was set aside for clinical pharmacists to become more involved in antibiotic prescribing.[2] Acute trusts in the UK have used this funding in a number of different ways and at Ipswich Hospital NHS Trust (IHT), this money was used to fund the part of my role concerned with antimicrobial prescribing (approximately one third of the role).

One of several interventions that have been developed at IHT is a weekly ward-round called the micro-pharm review. This was devised so that clinical pharmacists could become more involved with and contribute to the review of individual patients' antimicrobial treatment. Clinical pharmacists and medical and nursing staff were all made aware of this new initiative before it began, by the circulation of a memo from the consultant microbiologists and antimicrobial pharmacist.

The initiative was based on my experiences at Southampton University Hospitals NHS Trust (SUHT) where I worked before joining IHT. At SUHT, a similar review is operated on a directorate-based system and results from this work have been published.[3]

The review

At IHT, an 800-bed district general hospital, a directorate-based review such as that in operation at SUHT would not have been practical, mainly due to the limited time available to both the directorate pharmacists and consultant microbiologists. Therefore a trust-wide review (excluding oncology and paediatrics), based on the format used at SUHT, was piloted for eight months.

Every Wednesday morning, as part of their normal ward visits, clinical pharmacists identified patients who would benefit from a review of their antimicrobial treatment using specific criteria. The criteria, kept broad to widen the basis for prescribing review, were:

- Inappropriate choice of antimicrobial for the infection being treated
- Inappropriate duration of antimicrobial treatment
- Inappropriate route of antimicrobial treatment
- Inappropriate dose of antimicrobial treatment

The clinical pharmacist recorded patient details, the ward, the antimicrobial treatment prescribed, the indication and any other relevant information (eg, renal function and allergy status) on a form. These forms were then collated by the antimicrobial pharmacist and copied to the consultant microbiologist by about midday so that any microbiological data could be recorded before the afternoon ward round. Relevant biochemistry was added to the form by the antimicrobial pharmacist.

The antimicrobial pharmacist and the consultant microbiologist jointly reviewed

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the treatment of these patients in the afternoon of the same day using the patients' notes and drug charts. Where antimicrobial treatment was found to be inappropriate or unnecessary, recommendations were documented in the patient's notes and feedback was given to the referring clinical pharmacist. Medical staff were also contacted to discuss individual cases where appropriate.

During the pilot period (February to September 2004), 87 patients were reviewed. Of these, 81 were reviewed once, five were reviewed twice and one patient was reviewed three times (a total of 94 reviews). The specialty of the prescribing teams involved during the pilot can be found in Panel 1. Each weekly review took approximately 40 minutes.

A recommendation to review the drug choice, dosage, route, course length or the need for antimicrobial treatment was made in 52 reviews. No recommendation was needed in 42 reviews. The medical teams reviewed the patients' antimicrobial treatment according to the recommendation(s) made by the micro-pharm review in 48 out of the 52 cases (52 per cent changed the prescription the same day, 85 per cent made a change within 24 hours and 95 per cent made a change within six days).

The most common reason for intervention was inappropriate choice of antimicrobial. The remaining reasons (in descending order of frequency) were: no indication for the antimicrobial, inappropriate dose, inappropriate route, and inappropriate course length.

The pilot period showed that the SUHT model can be adapted successfully for use in a district general hospital. Where patients are reviewed and recommendations made, medical teams act on the advice given.

Limitations

There were a number of limitations to this review, which were highlighted during the pilot. A significant problem was the inability to identify why patients had been prescribed an antibiotic, which commonly proved time-consuming to resolve. Often the indication was not recorded in the notes which meant that pharmacists referred patients for review according to the study criteria. Consequently, after discussion with the medical team some patients referred for review were found actually to be on appropriate antimicrobial treatment. This may be one explanation as to why no action was needed in 42 out of the 94 reviews. As a result it has been highlighted that improvements are needed in documenting antimicrobial prescribing in the medical notes.

This pilot was not designed to show any effect on antimicrobial expenditure because of the difficulties in accurately calculating this information. However, ensuring that antimicrobials are prescribed appropriately does not necessarily result in cost saving. A useful direction for future research would be to investigate this aspect.

The pilot study only provided a "snapshot" of antimicrobial prescribing in the trust. Patients were only referred once a week and if a patient needed to be reviewed on the following day this was done outside the study. There are also possible limitations in relying on patients' case notes when evaluating antimicrobial treatment for the reasons given above.

Panel 1: Prescribing teams involved in the pilot

Prescribing Team	No of Reviews
Medical	62
Orthopaedic	8
Surgery	19
Urology	1
Rheumatology	2
Special surgery	2

Benefits

Clinical pharmacists at IHT are now more confident when enquiring about the use of antimicrobials. They receive feedback about each patient that they have referred which helps improve their understanding and knowledge of infection management. One example of this has been the importance of distinguishing between colonisation and infection when an organism has been isolated from a wound by the laboratory. The review has also identified areas where prescribers within the trust could benefit from education, such as the treatment of methicillin resistant *Staphylococcus aureus*, the treatment of community-acquired pneumonia, and the need to document prescribing decisions in the patient's notes.

This review has continued to strengthen the working relationship between the pharmacy and microbiology departments at IHT and there is now a greater awareness of the review on the wards because of the increased visibility of both professions.

Future plans

The micro-pharm review will continue at IHT. The criteria will largely remain the same but the antimicrobial pharmacist may now intervene at the point of referral if the patient does not need to be reviewed. The review will also be used to monitor and target antimicrobial prescribing for specific infections when there is a change in the trust antimicrobial policy. The review will continue to identify areas where pharmacists can become more proactive (eg, allowing the clinical pharmacist to switch patients from intravenous to oral quinolones). Finally the inclusion of oncology and paediatric patients in the review and inviting junior medical staff to attend the review as part of their education and training will be considered.

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