Saving Lives: reducing infection, delivering clean and safe care

Antimicrobial prescribing

A summary of best practice

Objective

To provide a framework for trusts to review their antimicrobial prescribing practice in order to ensure the safe and appropriate prescribing of antimicrobials.

This framework is aimed at:

- directors of infection prevention and control
- drug and therapeutic committee chairs
- consultant medical microbiologists and infectious diseases physicians
- pharmacists
- clinical directors

to help them develop their antimicrobial prescribing strategies and policies.

Aim

This strategy presents recommendations that, if implemented, will help:

- reduce the risk of infection from MRSA, other resistant bacteria and *Clostridium difficile* (*C. difficile)*
- maintain the effectiveness of antimicrobial agents in the treatment of infections by reducing the risk of bacteria developing antimicrobial resistance.

Context

With the increasing incidence of *C. difficile* associated disease (CDAD), the continued emergence of organisms resistant to antimicrobial agents, and increasing concern about healthcare-associated infections (HCAIs), there is a clear need to optimise the use of antimicrobial agents in all healthcare settings.

In 2003, the Chief Medical Officer's report Winning ways set out a strategy for managing infectious diseases and controlling antimicrobial resistance.[1] This approach was given legal force in 2006 with the Code of Practice for the Prevention and Control of Healthcare Associated Infections (part of the Health Act 2006),[2] which requires NHS bodies to have an antimicrobial prescribing policy in place. The Healthcare Commission will be using antimicrobial prescribing and infection control as elements of its review indicators. The Specialist Advisory Committee on Antimicrobial Resistance has recently set out more detail on antimicrobial strategies and policies in its antimicrobial prescribing framework.[3]

Reasons for action

Effective antimicrobial stewardship in hospitals, in combination with the high impact interventions for clinical procedures, makes an important contribution to the control and prevention of CDAD and other HCAIs.

Since 1990, there has been a considerable rise in the incidence of CDAD, and this has been paralleled by a large increase in antimicrobial consumption. There is now a large body of evidence to support the hypothesis that the use of broad-spectrum antimicrobials is a major factor in inducing CDAD. It is therefore likely that increased antimicrobial prescribing is a major factor in increasing rates of CDAD.[4,5]

Antimicrobial management is a key component of infection prevention and control, and prudent antimicrobial prescribing is important in reducing the prevalence of CDAD. Although the evidence is not so readily available, there are indications from the DH Improvement Programme that a reduction in the use of broad-spectrum antimicrobials can play a part in reducing MRSA infection rates too. There is evidence to show an association between total antimicrobial use and MRSA prevalence, and it also appears that some specific classes of antimicrobials, such as macrolides, quinolones and third-generation cephalosporins, are associated with higher MRSA prevalence.

The evidence that overprescribing and inappropriate usage is generally the main driver of increased resistance to antimicrobials is overwhelming. However, a reduction in the use of one class of antimicrobials alone may not always have the desired effect in terms of overall resistance reduction.

In view of the dangers of overprescription, all trusts should regularly review their antimicrobial prescribing policies to ensure they include essential information on dose, route and duration of therapy as well as selection of antimicrobial agent. This is a requirement of the Health Act 2006 Code of Practice for the Prevention and Control of Healthcare Associated Infections.

Effective antimicrobial stewardship programmes improve patient care and can be financially self-supporting.

This best practice summary sets out the essential components of an effective antimicrobial prescribing policy. It does not recommend specific antimicrobial agents for particular clinical circumstances but does indicate the main principles that should underpin locally decided policies.

Recommendations for overall antimicrobials management

1. The trust should have an antimicrobial prescribing and management policy
The policy must be reviewed regularly and compliance-audited. In most situations, the director of infection prevention and control should have executive responsibility along with the drug and therapeutic committee for the content, implementation and monitoring of the policy, in collaboration with a range of professionals (clinicians, microbiologists, pharmacists).

The policy should be readily available to all relevant healthcare professional prescribers, to whom a 'pocket-sized' summary should be provided at induction.

2. The trust should have a strategy for implementing the policy
Although there is no single model, appropriate antimicrobial stewardship should include the following elements:
- an expert multidisciplinary antimicrobial stewardship team (including a microbiologist, an infectious diseases physician and/or other appropriate clinician(s), and a clinical pharmacist with infection training) which should oversee the policy
- regular audit of antimicrobial prescribing by individual clinicians or teams, at directorate and institutional levels, against the recommendations in the local formulary
- hospital pharmacists with special responsibility for antimicrobial prescribing
- implementation of electronic/computer-aided prescribing tools where appropriate
- collaboration between the antimicrobial stewardship team and the hospital infection control and drug and therapeutic/pharmacy committees
- an appropriate training programme which all prescribers should undergo.

3. The trust should have an antimicrobial formulary and guidelines for antimicrobial treatment and prophylaxis
Trusts should have an antimicrobial formulary, developed locally and regularly reviewed by a microbiologist and/or infectious diseases consultant with an understanding of local resistance data and a pharmacist with responsibility for antimicrobials.

Within a trust's overall formulary, each clinical division/directorate or unit should have its own specific formulary. These should identify antimicrobials that are:
- restricted (ie need authorisation)
- unrestricted
- permitted for specific indications.

The guidelines should be evidence-based and reflect nationally agreed practice, and should specify recommended agent(s), dose, route and duration of antimicrobial treatment for major categories of infection.

Good practice recommendations for appropriate prescribing of antimicrobials

4. Decision to prescribe
The decision to prescribe an antimicrobial should always be clinically justified and the reason(s) should be recorded in the patient's medical record. It is important not to prescribe antimicrobials on a 'just in case' basis. Antimicrobials prescribed empirically in life-threatening situations should be reviewed early in the light of microbiological results, clinical progress etc and where necessary changed or discontinued as soon as is reasonable.

Individual patient and drug-specific factors to consider in all cases include:
- previous antimicrobial history
- previous infection with multi-resistant organisms
- allergies
- availability of and absorption by oral route.

5. Intravenous or oral therapy
Unless there are no alternative suitable agents, intravenous (IV) therapy should only be used for those patients with severe infections and/or who are unable to take oral antimicrobials.

As a general rule, IV antimicrobials should only be prescribed for two days, after which the prescription should be reviewed and, if appropriate, the patient switched to an oral equivalent.

6. Review of antimicrobial treatment
It is important to embed a prescribing culture which includes daily review, de-escalation from IV to oral therapy, and setting a maximum duration for treatment without repeat prescription, unless there is a clear indication in the medical record that antimicrobials should be continued, eg a specific infection that requires extended therapy.

Antimicrobials should generally be prescribed for a maximum of seven days, or a shorter period if this is clinically appropriate; however, some specific conditions require a longer course.

The patient's microbiology results should be reviewed regularly and antimicrobial therapy rationalised accordingly. In a critical care environment, for example, joint daily rounds between intensivist, microbiologist and pharmacist should be considered.

7. Minimising use of broad-spectrum antimicrobials
As observed above, the use of broad-spectrum antimicrobial agents is a major factor in inducing CDAD. Clinicians should therefore avoid the widespread use of cephalosporins, quinolones, broad-spectrum penicillins (including amoxicillin) and clindamycin unless there are clear clinical indications for their use.

Broad-spectrum antimicrobials should be restricted to the treatment of serious infections when the pathogen is not known or when other effective agents are unavailable.

Restricted antimicrobials should not be held in main ward stocks and should only be issued on advice from a microbiologist/infectious diseases consultant or under an agreed policy.

8. Use of single dose for surgical prophylaxis
Prophylactic antimicrobial use has an important part to play in the prevention of post-operative wound and deep site infections. However, the key principle in this use is to have a high concentration of the antimicrobial agent(s) in the relevant tissues at the time of the operation, when bacteria may contaminate the tissues. For most operations, this requires only a single dose of the antimicrobial(s) at induction of anaesthesia. Only in lengthy operations (over four hours) may a second intraoperative dose be considered necessary. Policies for the prophylactic use of antimicrobials should state that the single dose is the preferred option.

Conclusion
All trusts, as a matter of urgency, should review their strategies and policies for antimicrobial prescribing so as to determine the most appropriate local approach for the immediate implementation of these recommendations.

References

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281812/ANT 1p 50k Jun07 (BEL)