



ROYAL COLLEGE OF
PHYSICIANS OF IRELAND

Policy Group on Healthcare-Associated Infection (HCAI)

Antibiotic Use And The Implications For Healthcare-Associated Infection



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Executive Summary

Healthcare-associated infection (HCAI) is a complex and challenging issue for society, involving multiple contributory factors. The Royal College of Physicians of Ireland Policy Group on Healthcare-Associated Infection, chaired by Professor Hilary Humphreys, Professor of Clinical Microbiology, RCSI Education & Research Centre, Beaumont Hospital, intends to publish a number of position papers on contributory factors and other topics related to HCAI over the next 12 months. The first topic to be addressed is antibiotic use and the implications for HCAI.

Antibiotics are a precious health resource and should be used prudently. Many bacterial infections have become resistant to antibiotics because of the bacteria's ability to change and adapt to different environments, including exposure to antibiotics. Ireland is one of only three countries in Europe where outpatient antibiotic prescribing is increasing.

RCPI believes that postgraduate medical education and training has an essential role to play in the reduction of antibiotic consumption in Ireland and has introduced a mandatory prescribing skills course for junior doctors on its training programmes. The public can also help by understanding that not every infection requires an antibiotic. Most common infections, and in particular colds and flu-like illnesses, are caused by viruses and therefore will not respond to antibiotics.

Antibiotic Use And The Implications For Healthcare-Associated Infection

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Key Points

- In Ireland members of the general public often expect an antibiotic when they have an infection, but most common infections are caused by viruses and therefore do not respond to antibiotics. Antibiotics kill bacteria, not viruses.
- Many bacteria have become resistant to antibiotics because of their ability to change and adapt to different environments, including exposure to antibiotics.
- Unlike other medications, excessive antibiotic use has implications not only for the individual patient but also for the wider community, as excessive use leads to antibiotic resistant bacteria that affect us all.
- As a precious health resource, antibiotics should be used prudently. If not, there are implications for all infections including Healthcare Associated Infections (HCAs) such as MRSA.
- Ireland is one of only three countries in Europe where outpatient antibiotic prescribing is increasing (3% since 2000).
- When prescribing an antibiotic, doctors must consider the benefits to the patient, including potential side effects, and the consequences for the wider community, in terms of antibiotic resistance.
- RCPI, through its involvement in postgraduate medical education and training, is supporting efforts to reduce antibiotic use by providing training on this topic to over 1,000 junior doctors on its postgraduate training programmes.
- The public can greatly assist by understanding that not every infection requires an antibiotic. Most common infections, and in particular colds and flu-like illnesses, are caused by viruses and therefore will not respond to antibiotics.

A Brief History Of Antibiotic Use

Antibiotics have only been available to treat bacterial infections since 1941 and in the intervening period have saved millions of lives. Infections that used to be fatal, such as pneumonia and meningitis, can now be cured with a course of antibiotics.

During the 1960s, 1970s and 1980s, many new antibiotics were introduced to the market. However many of them did not represent genuinely new approaches to treatment and were similar to drugs already available. Since the 1980s, relatively few new antibiotics with novel mechanisms of action have been developed to address the problems of antibiotic resistance and the emergence of new infections.

Treating Antibiotic-Resistant Infections - Limited Options

Many bacteria have become resistant to antibiotics in the 60 years since their introduction because of their ability to change and adapt to different environments. Antibiotic-resistant bacteria such as MRSA and vancomycin-resistant enterococci (VRE) have become frequent causes of infection in Irish hospitals. While there are still drugs available to treat these infections, they are more expensive and tend to have serious side effects.

In the case of multi-resistant *E. coli* and *Acinetobacter*, both of which can cause life-threatening infections, there are sometimes only one or two powerful antibiotics to choose from and these can be associated with significant toxicity and serious side effects.

Unfortunately the pharmaceutical sector does not appear to anticipate significant earnings from the development of important but infrequently used anti-bacterial agents to treat resistant bacterial infections, so there are currently few, if any, new agents anticipated for use in HCAI-affected patients in the foreseeable future.

The Challenges Of Controlling Antibiotic Resistance

Every time a doctor prescribes an antibiotic, the effects of that antibiotic, and in particular the development of resistance, affects not only the individual patient but also the wider community.

Unlike other classes of drugs, for example blood-thinners prescribed for stroke prevention, an antibiotic prescribed for an individual has implications for other members of society. The emergence of resistance can spread and resistant bacteria can subsequently cause serious infections in others.

Therefore, the doctor must balance the needs of the individual patient and the choice of antibiotic, against the potential consequences of emerging antibiotic resistance. This is not always easy.

Ireland's Rate Of Antibiotic Consumption Is High And Increasing

Ireland is ranked ninth highest in Europe for the volume of outpatient antibiotics prescribed (our nearest neighbours, the UK, is ranked joint 18th with Norway and Sweden).

For every 1,000 members of the Irish population there were 22.5 daily defined doses^{*} of antibiotics per day in Ireland in 2007 (Health Protection Surveillance Centre and the European Surveillance of Antibiotic Consumption). There were 21.1 daily defined doses per 1,000 inhabitants in 2006. Ireland is one of only three countries in Europe where the consumption of antibiotics is increasing, at a rate of 3% per year since 2000.

In countries with low levels of antibiotic resistance, such as the Netherlands and Sweden (11-15 daily defined doses per 1,000 inhabitants per day), the volume of outpatient antibiotic prescribing is low and declining.

The volume of antibiotic prescriptions in Irish hospitals is also increasing, from 78.7 daily defined doses per 1,000 bed days in 2006 to 80.6 daily defined doses in 2007. Compared to the rest of Europe, these are mid-to-high levels of antibiotic use.

The Role Of Medical Education Providers

Antibiotic resistance and the appropriate use of antibiotics is an increasingly important topic in medical undergraduate and postgraduate curricula. All doctors need to understand which antibiotics to use and when, and also how to avoid some of the common side effects, such as nausea, skin rashes and diarrhoea.

In hospitals, this can be achieved by having expert advice readily available from microbiologists, infectious disease physicians and antimicrobial pharmacists. Regular audit, feedback on prescribing and restrictions on the use of some antibiotics also help to inform and educate.

RCPI provides postgraduate medical education and training to over 1,000 junior hospital doctors. As a medical education provider, it is committed to reducing the amount of antibiotics prescribed and improving the quality of prescribing by providing training on this topic for the doctors on its postgraduate training programmes.

By working with pharmacists and other healthcare professionals, RCPI believes that it is possible to significantly alter the consumption of antibiotics in Ireland to levels seen in countries where antibiotic resistance is low, while at the same time not compromising the quality of the individual patient's care.

Public Education Is Also Important

Members of the public often expect an antibiotic when they have a cold or flu-like illness, but these illnesses are caused mainly by viruses and therefore will not respond to antibiotics. Symptomatic relief can be provided by antipyretic agents (to reduce fever), bed rest and hydration. An antibiotic will not shorten the illness, despite what patients may sometimes think.

^{*} A World Health Organisation statistical measure of drug consumption

The public must understand that when a general practitioner or hospital doctor does not prescribe an antibiotic for a viral infection, he/she is not only acting in the best interest of the individual patient but also in the interest of society as a whole.

Prudent antibiotic use benefits the individual patient and the wider community because it helps prevent antibiotic resistance.

Recommendations

RCPI is strongly in favour of reducing antibiotic consumption in Ireland and keen to promote the message that Ireland's overuse of antibiotics has serious consequences for Healthcare Associated Infection.

Reducing antibiotic use will reduce costs for patients and the Health Service Executive, minimise side effects and more importantly, help check the development and spread of antibiotic resistant bacteria.

- In Ireland doctors need to reduce the amount of antibiotics being prescribed, which is high by European standards.
- Efforts must be made to educate trainee doctors about prudent antibiotic use.
- Medical education providers must promote awareness of antibiotic resistance and the appropriate use of antibiotics as key aspects of a modern medical curriculum.
- The public can also help prevent the emergence of antibiotic resistance by not always expecting an antibiotic from a doctor when an infection is present.

RCPI Policy Group on Healthcare-Associated Infection (HCAI)

As part of The Royal College of Physicians of Ireland's (RCPI) aim to play a proactive role in the development of healthcare policy, it is convening a number of issue-focused policy groups that will allow medical experts to meet and discuss healthcare matters of concern to health professionals, healthcare providers and the general public. These policy groups will produce evidence-based position papers that outline the issue and propose specific steps to address the issue.

The RCPI Policy Group on Healthcare-Associated Infection, the first of these policy groups, was established in 2008. It intends to publish individual position papers on contributory factors and other topics related to HCAI over the next 12 months.

Members:

Professor Hilary Humphreys (Chair) - Professor of Clinical Microbiology, based at Beaumont Hospital and recently stood down as Chairman of the National Committee for the Strategy for the Control of Antimicrobial Resistance in Ireland (SARI).

Dr Mary Horgan - Infectious Disease Physician, based at Cork University Hospital and has a long-standing interest in antibiotic use and resistance.

Dr Brian O'Connell - Consultant Microbiologist at St James's Hospital and Medical Director of the National MRSA Reference Laboratory.

Dr Ciarán Donegan - Consultant Physician in Healthcare of the Elderly at Beaumont Hospital. Many HCAI disproportionately affect the elderly.

Dr Phil Jennings - Public Health Specialist, Director of Public Health with the HSE and active in regional and national committees relating to the Strategy for SARI.

Ms Máire Beckett - Senior Infection Prevention and Control Nurse in the Rotunda Hospital.

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