

Antibiotic Resistance: Role of General Dental Practitioners

Peninsula Dental School is a key provider of dental education in the UK and its unique setting in primary care provides huge opportunities for engagement with general dental practitioners (GDPs) many of whom are involved in teaching and training of dental students. The school is committed to raising awareness regarding antibiotic resistance and ensuring that antibiotics are prescribed appropriately to patients attending the Dental Education Facilities across multiple sites across the South West. Many students and staff members have already become “Antibiotic Guardians”.

The purpose of this blog is to reinforce the role of general dental practitioners in minimising the unnecessary use of antibiotics in Dentistry as part of the World Antibiotic Awareness Week (WAAW).

The Challenge

Dental professionals working in Primary Care Settings contribute to the antibiotic prescriptions in the UK. Antibiotic resistance is a major global public health issue with increasing magnitude, general dental practitioners have a key role in the preventing and minimizing the threat of antibiotic resistance. The World Health Organisation (WHO) has predicted that a *“Doomsday health crisis looms if we do not anticipate a post-antibiotic era”*. As highlighted by the Director General WHO *“A post antibiotic era means, in effect, an end to modern day medicine as we know it. Things as common as Strep throat or a child’s scratched knee could once again kill”*. The risk of growing antibiotic resistance is significant and may not only result in common infections becoming potentially fatal but may also mean that life-saving treatments such as surgical procedures & cancer treatments may not remain feasible due to the risk of infection. The implications not limited to humans but also involve animals especially livestock.

The Reasons

Bacteria have the ability to change and develop resistance to antibiotics which is either plasmid-mediated or maintained on the bacterial chromosome. This can happen in several ways including production of bacterial enzymes which inactivate antibiotics; modifications in the bacterial cell walls rendering them impermeable to antibiotics; activation of drug efflux pumps reducing the concentration of antibiotics in bacterial cells; and alterations in target sites for antibiotics.

The main reasons of growing antibiotic resistance include: Over-prescription of antibiotics in humans as well as livestock and fish farming; patients not completing their course of treatment; self-prescription including use of left-over antibiotics; poor hygiene and sanitation; and inadequate infection control in healthcare facilities including hospitals and clinics.

Unfortunately, there is lack of new antibiotics to target the growing populations of resistant bacteria. Current research is focused on developing alternate and new treatments to tackle antibiotic resistance including the use of probiotics, vaccines, bacteriophage therapy, inhibitors of drug efflux pumps, photodynamic therapy and new classes of antimicrobial agents. However, most of these treatments are still under development and antibiotic resistance remains a massive challenge!

Antibiotic in Dentistry: *To Prescribe or not prescribe?*

Most dental problems do not warrant antibiotic prescriptions and are best managed with appropriate operative treatment. Antibiotics should only be used as an adjunct to operative intervention when strictly indicated. Moreover, antibiotics do not compensate for poor operative treatment. When prescribing, dental practitioners need to consider dosage, duration and recognition of adverse effects / contra indications of antibiotics. Any temptation to prescribe antibiotics due to patients insisting on antibiotics must be avoided.

Dental pain resulting from pulpitis and localised endodontic infection does not warrant use of antibiotics and should be managed by operative treatment (root canal treatment/ tooth extraction as indicated) with appropriate analgesic cover. Similarly, localised dental abscesses due to a pulpal or periodontal cause are treated by establishing drainage using appropriate methods (pulp access opening; surgical incision, or extraction of the offending tooth). Lastly, mild pericoronitis and dry socket (alveolar osteitis) do not require antibiotics and can be managed conservatively with irrigation and analgesics.

Antibiotics may be required for patients presenting with acute necrotising ulcerative gingivitis; severe pericoronitis, rapidly progressing diffuse swelling involving fascial spaces, severe trismus (<20mm) and jaw osteomyelitis. However, patients with signs of a spreading orofacial infection

should be referred to secondary care urgently and should not be managed in primary care with or without antibiotics. The indications for referral include: difficulty in breathing/swallowing due to diffuse swelling; severe malaise or toxic appearance with elevated temperature (>102°F) severe trismus, compromised host defences, and need for a general anaesthetic.

Resources



Developed in 2014 by Public Health England, **Antibiotic Guardian** aims to raise awareness regarding antibiotic resistance and includes links to the UK Five Year Antimicrobial Resistance Strategy 2013-18

<http://antibioticguardian.com/>



The Dental Antimicrobial Stewardship (AMS) toolkit for primary care

<https://www.gov.uk/guidance/dental-antimicrobial-stewardship-toolkit>

Comprehensive guidance on antimicrobial prescribing in dentistry can be accessed online free of cost:



Faculty of General Dental Practitioners (FGDP UK):

Antimicrobial Prescribing For GDPs

<http://www.fgdp.org.uk/publications/antimicrobial-prescribing-standards.ashx>



Scottish Dental Clinical Effectiveness Programme (SDCEP)

Bacterial Infections Management Guide poster

SDCEP Drug Prescribing for Dentistry 3rd edition

<http://www.sdcep.org.uk/published-guidance/drug-prescribing/>

Dental professionals in the UK can undertake online education and training through the e-learning for Healthcare at <http://www.e-lfh.org.uk/>

The screenshot shows the e-LFH website interface. At the top left is the e-LFH logo with the tagline 'e-Learning for Healthcare'. To its right is a quote: 'An extraordinary project in terms of breadth and skill of content' attributed to 'e-Learning Age - Judges citation'. Further right are 'Register' and 'Log in' buttons. Below this is a navigation bar with links for Home, Programmes, About, Latest News, Support, Demo, and Contact Us, along with a search box. The main content area features a large banner for 'Reducing Antimicrobial Resistance' with a sub-headline 'An e-learning package to support staff in understanding the threats posed by antimicrobial resistance' and an image of a microorganism. Below the banner are three columns: 'Menu' with radio buttons for 'Antimicrobial Resistance' and 'Resources for all staff working in health and'; 'How to access' with instructions on creating an account or logging in; and 'In partnership with' featuring the NHS Health Education England logo.

The Message Antibiotic resistance is major public health issue and dentists need to play their role by restricting antibiotic prescriptions to clinical situations when absolutely necessary. A range of resources are available to help improve our understanding regarding antibiotic resistance. Dental professionals should stay updated on antibiotic resistance and spread the message to their colleagues and patients.