

Antimicrobial stewardship and antimicrobial resistance in wound management: The role of pharmacists

ABSTRACT

The continued risk of antimicrobial resistance (AMR) is becoming a global crisis and action to reduce and educate all health care professionals, patients and carers is essential. Reduction in AMR is the responsibility of everyone, and it is appropriate to develop and embed the role of antimicrobial stewardship guardians into care environments. A key professional group in the fight against AMR and implementation of antimicrobial stewardship is the pharmacist. This paper explores their unique role in antimicrobial stewardship.

Keywords antimicrobial resistance, antimicrobial stewardship, pharmacists, wounds

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ANTIMICROBIAL RESISTANCE

The continued risk of AMR, defined as the loss of effectiveness of any anti-infective medicine, including antiviral, antifungal, antibacterial and antiparasitic medicines¹, has been highlighted by the World Health Organisation² [WHO] as being a global catastrophe. Antimicrobial resistance arises when organisms that cause infection evolve in ways to survive treatments³, this resistance is a natural biological phenomenon increased and accelerated by various factors including for example, misuse of medicines and poor infection control practices⁴. Development of new antibiotics has been slow while there has been an increase in resistance of microorganisms identifying the urgent need for the world to implement clear and effective strategies to combat this crisis. Without effective antimicrobials for prevention and treatment of infections, the success of organ transplantation, cancer chemotherapy and major surgery would be compromised. Inappropriate use of antimicrobials drives the development of drug resistance, both overuse, underuse and misuse of medicines contribute

to the problem. The overuse of antimicrobials in wound care has been identified with Lipsky et al.,⁵ discussing global studies demonstrating that approximately 80% of antibiotic courses, and 20% of all antibiotics administered, are prescribed in the community or ambulatory setting. Guest et al⁶, in their United Kingdom study, concluded 50% of all community wounds annually had at least one course of antibiotics prescribed.

Reduction in AMR is the responsibility of all health care providers. All professionals involved in patient treatment are essential partners in any strategy to control the use of antimicrobials and reduce and prevent AMR including patients, carers medical staff, nurses, podiatrists and pharmacists. To tackle the spread of AMR and make effective use of antimicrobials, antimicrobial stewardship programmes (AMSP) are being supported and implemented across all health and social care areas globally. These AMSP are defined as organisational or healthcare-system-wide approach to promoting and monitoring judicious use of antimicrobials to preserve their future effectiveness¹.

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PHARMACISTS AND ANTIMICROBIAL STEWARDSHIP

The role of the pharmacist has often been overlooked in the fight against AMR and their role in AMSP despite the profession being responsible for the dispensing of antimicrobial prescriptions in both the hospital and community setting. There have been several studies which have identified the role and impact of pharmacists and AMSP. Jamshed et al⁷ conducted a scoping review exploring AMSP in community pharmacies concluding that community pharmacists were aware of the antimicrobial resistance crisis and considered it a significant health issue with many pharmacists stating

dispensing antibiotics without medical prescription was a key concern in the dissemination of multidrug resistant bacteria. Essack⁸ et al demonstrated introduced a Global Respiratory Infection Partnership pharmacy-led educational initiative had a positive impact and promoted appropriate self-management of upper respiratory tract infections reducing levels of inappropriate antibiotic use. Similarly, Abubakar⁹ et al studied the impact of pharmacist-led antibiotic stewardship interventions in Nigeria on compliance with surgical antibiotic prophylaxis in obstetric and gynaecologic surgeries and found the interventions improved compliance with surgical antibiotic prophylaxis and reduced antibiotic utilization and cost. The role of pharmacists within AMSP and the opportunities for pharmacist-driven antimicrobial stewardship strategies in hospital and community settings was investigated by Garau¹⁰ who concluded AMR is a growing public health threat and pharmacists have a responsibility to take a prominent role in AMS and infection prevention and control programmes. Within the acute hospital, Ourghanlian¹¹ et al conducted a multicentre observational study identifying that antibiotic consumption was lower when the antibiotic advisor was a pharmacist and when the pharmaceutical team reviewed all prescriptions. The importance of a collaborate relationship between pharmacists and physicians was discussed by Klepser et al¹² suggesting a model where community pharmacists use rapid point-of-care tests to guide clinical decision making and initiate treatment as appropriate under a physician-led, evidence-based protocol. They concluded this research initiative can lead to more judicious use of antibiotics and antivirals, improve public health, and provide safe and convenient care for patients.

Education of health professionals and the community is critical to change over prescribing and inappropriate patient requests for antimicrobials. Gallagher et al¹³ compare the teaching of pharmacy students with mandates for antimicrobial stewardship to teaching infectious diseases thereby equipping them with the skills and knowledge required for antimicrobial stewardship, and providing recommendations for, and examples of, best practices in training student pharmacists to become antimicrobial stewards.

DEVELOPMENT OF ANTIMICROBIAL STEWARDSHIP PROGRAMMES

Development of AMSP should be devised in association with local healthcare providers, local advocacy groups and facility administration to meet local needs and reflect policies, however they should all be reviewed annually. When devising AMSP attention should be given to include guidance from international leading bodies including, The World Health Organisation, Transatlantic Taskforce on Antimicrobial Resistance (TATFAR), the Global Antibiotic Resistance Partnership (GARP) Global Health Security Agenda (GHSA), the Joint Programming Initiative on Antimicrobial Resistance (JPIAMR), Member States of the World Health Organization (WHO), Food and Agriculture Organization (FAO) and World Organisation for Animal Health (OIE) have endorsed a Global Action Plan on Antimicrobial Resistance¹⁴ (GAP).

Fundamentally all should incorporate:

- Definition of AMR and AMS
- Local guidance for identification, prevention, and management of wound infection
- Local wound care formulary
- Regular review and documentation of appropriateness of out and in patient prescribing of antimicrobials.

Lipsky et al., recommends conducting audits of:

- Frequency of examining for, and recording clinical signs of wound infection
- Recording specific infectious syndrome diagnoses
- Rationale for choice of an antibiotic regimen
- Compliance with local policies
- Clear documentation for duration of therapy and review dates
- Documentation of any antimicrobial adverse reactions

Integral to education are local quality improvement programmes which assess key components of wound assessment, management of wounds, wound infection rates and antimicrobial usage; these should include regular review, clear documentation, and measurement of clinical outcomes, for example, time to healing, incidence of wound infection. The importance of including pharmacists in development of AMSP is essential, they develop a unique relation with their customers and are able to discuss antimicrobial issues with in-depth knowledge, indeed Allison et al¹⁵ describes the ways in which pharmacists can help educate the public on key issues. Pharmacists have a significant role in optimising prescribing behaviour, monitoring antimicrobial use, infection control and education. However, there is a need for more AMS-trained pharmacists within the hospital and community settings. They have the expertise and skills to be able to effectively communicate any concerns to the prescriber and recommend alternative treatments.

Ousey et al¹⁶, (2021) highlighted the role of pharmacists and pharmacy teams in the management of wounds has become more apparent during the Covid-19 pandemic as the pharmacist often became the first point of contact for people with a wound. Pharmacists are often expected to deal with a wide variety of conditions and health questions, so can be responsible for effectively diagnosing as well as prescribing (NHS¹⁷; Pharmacy Magazine¹⁸). They are also highly trained in Pharmacokinetics (PK) and Pharmacodynamics (PD) and can advise on appropriate choices for a specific patient management to ensure both the effectiveness and safety of antimicrobials.

ANTIMICROBIAL GUARDIANS

With the continued AMR crisis, it is appropriate to develop the role of antimicrobial stewardship guardians like that of the antibiotic guardian role. This role will lead education programmes, development of resources for raising professional and public understanding of AMR and implementation of clear measures of success for the AMSP. An element of the guardian

role would be support for all clinicians when attempting to initiate these programmes across a range of health and social care areas. The pharmacist is in an ideal position to be a guardian and custodian of effective and appropriate antimicrobial prescribing. They are often the first point of contact for community patients when looking for advice re wounds, coughs, colds, chest infections and for professionals, the pharmacists are often asked for their advice for correct use of antimicrobials.

It is essential with any change there is clear measurement of AMSP to assess the difference, if any they make, to appropriate use of antimicrobials, reduction in inappropriate antimicrobial dressing use and to ensure that antimicrobial therapy is being implemented when clinically required. Collecting this data will allow for benchmarking that can promote improvements and development of local policies and guidance. Involvement of patients and relatives in guardian roles will help to raise the importance of AMSP, having a patient voice brings the importance of prevention and early appropriate treatment strategies to life. Similarly involving pharmacy teams will safeguard the judicious use of antimicrobials, with their expertise being used to suggest alternatives to antimicrobials and to only prescribe for a recommended period before a review of medications is needed.

SUMMARY

AMS is everyone's responsibility the crisis of AMR is not in the future it is now, strategies must be implemented globally and measured for their effectiveness if we are to avert tragedy. The importance of a multi-disciplinary team approach to AMR cannot be over emphasised but the often-overlooked role of the pharmacists in managing AMR and promoting AMSP requires further development. Pharmacists have a key role in the management of AMR and promotion of AMS as they are often the first point of contact for individuals with wounds and can advise health care professionals effective use of antimicrobials offering alternatives if appropriate.

FUTURE RESEARCH

The role of pharmacy teams continues to evolve globally with this professional group working seamlessly across all health care areas including primary, secondary and community. They possess an specialist knowledge of poly pharmacy and medications and are in an ideal position to provide expert advice for a range of skin conditions. There needs to be research exploring how pharmacists and pharmacists' teams can integrate into wound care and be recognised as an integral member of the multi-disciplinary team in this specialist area. Pre and post registration education should include wound allowing opportunities for pharmacists to develop an in-depth knowledge of wound care. Through education and development of pharmacists with a special interest in wound care there is potential to reduce hospital attendances to emergency departments and general practitioners for minor wounds.

CONFLICT OF INTEREST

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