Delayed prescribing of antibiotics for self-limiting respiratory tract infections in an urgent care out of hours setting.

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**Abstract**

Long term overuse of antibiotics plus inappropriate prescribing has led to widespread development of antimicrobial resistance. The Department of Health and Social Care recently published a five-year national action plan to reduce antimicrobial resistance, with one aim being to reduce antibiotic use, but when required, to use them in an appropriate way. This is mirrored in the National Health Service, Long Term Plan which aims to reduce unintentional exposure through the combination of antibiotic stewardship and leadership at all levels.

Acute respiratory tract infection is one of the most common presentations in primary care with 16.7% of all prescriptions issued attributed to it. Therefore, Out of Hours prescribers contribute significantly to general antibiotic consumption. This article analyses the practice of delayed prescribing of antibiotics for the treatment of self-limiting respiratory tract infections in an Out of Hours Service. The advantages and disadvantages associated with delayed prescribing, in order to safely treat patients whilst facilitating in the reduction of antimicrobial resistance will be discussed. In addition, recommendations for future practice will be offered. This article will also focus on the development of an Advanced Nurse Practitioner, reflecting on the four pillars of advanced practice which underpins advanced clinical practice and associated competencies (Health Education England (HEE), 2017).

**Emergent threat of antimicrobial resistance**

Long term overuse of antibiotics plus inappropriate prescribing has led to widespread development of antimicrobial resistance (AMR) (Public Health England (PHE), 2015). Global deaths due to infections as a result of AMR are estimated at 700,000 each year, and this figure is predicted to rise (World Health Organisation, 2018). Clearly, it is an emergent threat to public health. The Department of Health and Social Care (DHSC) recently published a five-year national action plan to reduce AMR, with one aim being to reduce antibiotic use, but when required, to use them in an appropriate way (DHSC, 2019). This mirrors the National Health Service (NHS) Long Term Plan which aims to optimise antibiotic use and reduce unintentional exposure through the combination of antibiotic stewardship and leadership at all levels (NHS, 2019). This is particularly pertinent when practising as an ANP.

**Acute respiratory tract infection and inappropriate prescribing**

Acute RTI is one of the most common presentations in primary care (National Institute for Health Care Excellence (NICE, 2008). RTI includes, common cold, sore throat, otitis media, cough, tonsillitis, pharyngitis, rhinosinusitis, and bronchitis (NICE, 2008). OOH is an integral service to primary care; 16.7% of prescriptions are issued for RTI, therefore OOH prescribers contribute significantly to general antibiotic consumption (Lindberg, Gjelstad, Foshaug et al., 2017). Patients with viral RTIs rarely need antibiotics, as they are generally self-limiting, unless there is an underlying comorbidity (Huang, Chen, Wu et al., 2013, NICE, 2008, PHE, 2019). Prescribing antibiotics unnecessarily drains NHS resources and creates risk of serious outcomes for patient health, including associated side effects and AMR (Costelloe, Metcalfe, Lovering et al., 2010). Furthermore, inappropriate use of antibiotics encourages beliefs about the effectiveness of antibiotics, encourages patients to re-consult thereby reducing the probability of self‐management (Williamson, Benge, Mullee et al., 2006). PHE recently published research indicating that 20% of antibiotic prescribing in primary care is inappropriate (Davies, 2018). An immediate reduction of prescribing by 10% is required to meet the Government target which aims to reduce antibiotic prescriptions by 50% by 2020 (DHSC, 2019).

**Delayed prescribing of antibiotics**

To aid unnecessary prescribing by health professionals, DPA for RTI is a method that can be utilised within primary care (Little, Moore, Kelly et al., 2014). This requires the prescriber to issue a prescription for antibiotics with clear advice that they may be taken at a later date, but crucially, only if the symptoms persist or worsen within a specific time frame (NICE, 2008). NICE advocates self-management of self-limiting RTI, however DPA has been recommended as a management option for most patients with RTI, unless they have risk factors that indicate possible complications (NICE, 2008). Evidence suggests that DPA provides similar benefits to prescribing immediate antibiotics with no differing outcomes, whilst creating a reduction in antibiotic use (Spurling, Del Mar, Dooley, et al., 2017). However, reports indicate that DPA may not be used widely or consistently enough by health care professionals, whilst increases in OOH and urgent care antibiotic prescriptions are noted (Public Health England, 2018). ANPs have a crucial role in the management of AMR, to avoid inappropriate prescribing of antibiotics.

**Role of ANP’s**

ANPs have an important role in all elements of patient care, including assessment, diagnosis, prescribing and individualised management planning; therefore, they have the capacity for considerable impact on reduction of antibiotic use. In the OOH setting, patients who attend are more likely to be seriously unwell (Huibers, Moth, Bondevik, er al., 2011). When considering whether to prescribe antibiotics, increased risk of serious illness presents a challenge to autonomous practise as an ANP. Immediate antibiotics or referral to secondary care is required for patients that are systemically unwell, or with signs or symptoms indicating pneumonia, peritonsillar abscess, cellulitis or mastoiditis (NICE, 2008). Pre-existing comorbidity is considered because this creates high risk of serious complications for example immunosuppression, organ disease, cystic fibrosis, neuromuscular disease, and prematurity (NICE, 2018). DPA is unsuitable for use with patients older than 65 years with acute cough and previous hospitalisation in the last year, type one or two diabetes, history of heart failure, or the use of oral glucocorticoids (NICE, 2008).

Working as an ANP involves responsibility and accountability for personal practice (Nursing and Midwifery Council (NMC), 2018), requiring a high level of knowledge to correctly diagnose an infection and treat it appropriately (HEE, 2017). However, it is important to recognise that diagnostic uncertainty plus patient pressure and expectations, can influence prescribing and alternative management interventions (Courtenay, Rowbotham, Lim et al., 2019). Utilising DPA involves a high level of clinical confidence as a key aspect when making prescribing decisions; low confidence leads to poor decisions. However, prescribing antibiotics on a just in case basis is associated with increased AMR (Courtenay, Rowbotham, Lim et al., 2019). Prescribing antibiotics without a clear rationale or evidence of a bacterial infection is inappropriate; national guidance should be adhered to regarding the management of infection in primary care (PHE, NICE, 2019).

**Delayed Prescribing of Antibiotics**

As highlighted, DPA in practice should be utilised for patients without risk criteria or concerns about deterioration (NICE, 2016). Methods of DPA include giving prescriptions by recontact; arranging for collection at a later date; or issuing the prescription with clear advice about when to use it (Little, Moore, Kelly et al., 2014). Evidence indicates little difference in the methods used for DPA with a similarity in patient satisfaction (Little, Moore, Kelly et al., 2014). In the OOH setting, recontact for review cannot be arranged during an initial consultation and collection at a later date is not applicable. This poses difficulties for non-prescribing clinicians in OOH, who work from patient group directions (PGD), supplying antibiotics directly from stock within a strict clinical situation (NICE, 2017). DPA is not written into these criteria and therefore practitioners would have to supply the patient with the medication in the hope that they would not administer the antibiotics immediately, but they would be working beyond the strict boundaries of the PGD legal framework; this may represent a criminal act (NICE, 2017). In this situation if DPA is required, advice should be sought from a prescribing clinician to maintain patient safety (HEE, 2017).

**Patient centered care**

The use of DPA should be individualised and patient centered (NICE, 2008). Patient centered care is essential to ensure adequate, efficient, secure and responsive healthcare provision (Coulter and Ellins, 2006, HEE, 2017). Within this, shared decision making is a vital element and has been shown to reduce antibiotic prescribing by nearly 40% for acute RTI within primary care (Coxeter, Del Mar, McGregor et al., 2015). DPA incorporates the shared decision-making process by allowing for discussion regarding the treatment options that are available to patients, clearly explaining about benefits and harms whilst allowing for values and preferences (Little, Moore, Kelly et al., 2014). Engaging and educating patients in decision making about antibiotic prescribing facilitates reduction of the side effects of antibiotics and helps to reduce AMR (Rawson, Moore, Holmes et al., 2018). This is a clear benefit of DPA. However, excellent communications skills are essential during each consultation, to allow for the assessment of the patient's basic knowledge and expectations and to tailor education appropriately about the natural history, development and recovery of RTI, plus antibiotic advantages and harms (Fleming-Dutra, Mangione-Smith, Hicks, 2016).

Little (2016) advocates the use of the mnemonic six “Rs” in consultations to aid in the delivery of safe practice with DAP, these include: reassurance, reasons not to use antibiotics, relief eg., paracetamol, realistic natural history of RTI, reinforce when to use antibiotics and rescue or safety netting. However, this can lead to an overly lengthy consultation (Williams, Halls, Tonkin-Crine, Moore et al., 2018). Whilst patients may benefit from and value the additional time spent with them (Courtney, Rowbotham, Lim et al., 2017), this may increase costs to an already financially constrained service (Moth, Huibers, Vedsted, 2013). In a fast paced OOH setting, with high patient demand, this is problematic and poses a clear disadvantage. In contrast there is evidence to indicate that there is no need for clinicians to devote additional time to consultations regarding prescribing antibiotic strategies as this can be achieved in the same average time of consultation while preserving a high degree of patient satisfaction (Cals, Butler, Hopstaken et al., 2009).

**Prediction scoring tools**

Patient care should represent individual requirements and preferences, particularly if there is no requirement for immediate antibiotics. In combination, it is essential to incorporate evidence-based practice (EBP) (NICE, 2008). EBP definitions frequently indicate that research evidence, patient values and clinical knowledge need to be integrated in order to provide optimal care (Sackett et al.,1997). EBP is key to the role as an ANP, incorporating research activity and adhering to excellent research practice guidelines is crucial to enhance safe patient care and outcomes (HEE, 2017). Several guidance documents produced by NICE (2008, 2018, 2019) are utilised when considering the use of DPA, a summary for prescribing antibiotics for common infections reduces risk of variation in practice (NICE, PHE, 2019). Other guidance offers symptomatic treatment alongside the consideration of DPA (NICE, 2019, 2008). Sore throat management must incorporate either the Centor clinical prediction score (Centor et al., 1981) or the FeverPAIN score (Little, Hobbs, Mant et al., 2012), to determine the possibility of a streptococcal infection and guide the necessity for antibiotic therapy (NICE, 2018). However, these tools are vague in approach because in previous guidance NICE (2008) advise that self-limiting RTIs do not require antibiotics, placing an emphasis on self-care as the preferred management option. Contradictory to this recent guidance, NICE (2019) highlights a FeverPAIN score of two or three for consideration of DPA, plus they advocate that immediate antibiotic prescribing should be initiated even when evidence indicates that antibiotics give no clear benefit.

Utilisation of other tools helps when considering DPA, including the fever traffic light system (NICE, 2013) which helps to assess a child under the age of five with a fever and URTI and associated risk of deterioration and illness. The National Early Warning Score 2 (NEWS2), (Royal College of Physicians (RCP), 2017) identifies adult, non-pregnant patients that are at risk of serious illness or deterioration (RCP, 2017). Whilst these tools aid decision making, it is recognised whilst practising, that they should not be used as solitary predictors for the safe management of patients. As such, clinical judgement is always applied on an individual basis (HEE, 2017).

**Antimicrobial stewardship**

It is imperative as an ANP to use leadership skills to promote an awareness of DPA as a potential treatment strategy to colleagues and patients to attempt a reduction in AMR. Whilst focusing on self-education as an ANP, a focus is also maintained on cascading findings to educate and empower peers with regard to DPA use in practice (PHE, 2019, HEE, 2017). Poor knowledge regarding the effects of antibiotic overuse and the DPA approach have been recognised as a hindrance to promoting the correct use of antibiotics (Costelloe, Metcalfe, Lovering et al., 2010). Antimicrobial stewardship guidelines have been developed, aiming to reduce AMR (NICE, 2015) throughout organisations. Antimicrobial stewardship programmes are provided to audit antimicrobial prescribing, assist clinicians to prescribe optimally and help change prescribing attitudes (PHE, 2015). Such programmes allow for regular feedback and audit regarding individual antimicrobial use and can be used as a benchmark to improve prescribing practice (NICE, 2015). Practising as an autonomous ANP it is essential to participate in self-directed learning, peer review and personal critical reflection, thus exploiting clinical knowledge and enhancing personal skills and ability to develop and lead both care and services (HEE, 2017). A web-based toolkit founded on EBP is utilised as key to self-directed learning, assisting in decision making and reducing inappropriate prescribing (Royal College of General Practitioners, 2018). ANP’s should familiarise themselves and peers with HEE e-learning which has online modules regarding AMR and prudent use of antibiotics (HEE, 2019). Overall knowledge of AMR increases the likelihood of adopting DPA into practice and recommending it to colleagues, which will help reduce side effects and complications related to antibiotic overuse (NICE, 2008).

**Patient expectations**

A difficulty in implementing DPA is patient’s expectations of being prescribed antibiotics (Peters, Rowbotham, Chisholm et al., 2011), inappropriate use of antibiotics has led to patients increased belief about their use, encouragement to reconsult and unwillingness to self-manage (NICE, 2008, Little, Moore, Kelly et al. 2014). In practice, working as an ANP in OOH this is problematic, and has been recognised amongst patients that have already been seen regarding their RTI if their symptoms have not yet resolved. Leadership skills are utilised by educating patients about how to self-manage their URTI when DPA has been agreed (NICE, 2017). Evidence has demonstrated that re-consultation rates and the demand for antibiotics are reduced if patients are advised regarding the expected progression of an illness and a self-care plan is negotiated (Ryves, Eyles, Moore et al., 2016, Ivers, Arroll, Allan et al. 2011). Acceptance of DPA improves when information is given regarding self-management with research highlighting that DPA encourages patient-centred care, empowering and educating patients to accept responsibility for their own health (Peters, Rowbotham, Chisholm et al., 2011). Patients can misinterpret the difference between viral and bacterial infections (Mehta, Schilder, Fragaszy et al., 2017), therefore as an ANP, educating patients about the differences, alongside the reasons not to prescribe antibiotics immediately is vital. Communication is fundamental, discussing the duration and the natural history of RTI, management of symptoms, with reinforcement about when and how to take the DPA allows for safe patient management (NICE, 2017).

**DPA in children**

In practice, children with URTI present frequently to OOH. Evidence indicates that antibiotic use for RTI in children has reduced significantly by almost half, primarily due to DPA being adopted in primary care (Little, 2005). However, care must be implemented when issuing DPA for children(Royal College of Paediatrics and Child Health (RCPCH), 2019). DPA should not be utilised as a method of treatment in children under three months of age (NICE, 2008), this age group has an increased occurrence of febrile illness as a result of occult bacteraemia (RCPCH, 2019). Children under two years may also have risk due to their inability to communicate symptoms accurately, caution is therefore exercised in this age group (RCPCH, 2019). However, DPA does have a place in the treatment of self-limiting RTI in children within primary care (NICE, 2008), and it is an ANP responsibility to ensure parents have adequate understanding regarding DPA, their home circumstances and about when to seek help, plus appropriate safety netting to provide safe care (RCPCH, 2019).

Working as an ANP patient safety and managing risk is pivotal to the role (HEE, 2017). Patient safety-netting is given following any consultation, with the use of DPA information being provided regarding potential side effects of antibiotics, red flag symptoms and signs of significant worsening symptoms despite using DPA and signposting about who to contact if symptoms worsen (NICE, 2008). Written guidance is offered, including fever management guidelines, a treat your infection leaflet (RCGP, 2018) and signposting to online web sites such as NHS choices.

**Legal implications**

A clear worry as a clinician is the legal implications of DPA. DPA or no prescribing of antibiotics may lead to disappointed patients and increase the chance of complications, complaints or a possible claim for clinical negligence (Pinder, Sallis, Berry et al., 2015). Large cohort studies regarding the use of DPA have shown that there is a reduction in antibiotic use without an increase in complications compared to immediate antibiotics for respiratory RTI (Moore, Stuart, Hobbs et al., 2017, Spurling, Del Mar, Dooley, et al., 2017). This clearly indicates that DPA is safe to use in practice if utilised correctly involving safety netting where there is clinical doubt (NICE, 2008). However, to inform clinical judgement and decision making, a duty as an ANP is to consider all guidelines and latest evidence available and assess patients on an individual basis (HEE, 2017). Excellent communication, good documentation of prescribing, clinical decisions and associated reasoning are the safest way to counter any possible complaints (NICE, 2015, Royal Pharmaceutical Society, 2016, HEE, 2017, NMC, 2018).

**Recommendations for practice**

Reducing AMR is a significant healthcare challenge. DPA is shown to be a safe and effective way of reducing AMR. A large number of patients attend OOH with acute RTI, these are commonly severe in nature, thus making DPA difficult to implement on such occasions (Williams, Halls, Tonkin-Crine, et al., 2018). It is crucial that all clinicians have the knowledge and skills to assess and manage patients that present with RTI within OOH, to allow for safe practice which is essential to the role as an ANP (HEE, 2017). Improving clinician awareness and knowledge regarding antimicrobial stewardship and DPA will promote its application in practice, reduce antibiotic misuse, and inappropriate prescribing (NICE, 2008, 2015, 2016, 2017). This is enabled by utilising education and leadership skills that are acquired as an ANP. ANPs must integrate EBP, guidelines and scoring tools to allow for safe practice and promote consistency (NICE, 2008, 2013, 2015, 2018, 2019, HEE, 2017). Excellent communication skills promote education of patients regarding the complications related to antibiotic use, the natural history of RTI and common causes associated. In turn this will allow for a patient centred approach, empowering patients to self-manage their symptoms (HEE, 2017). This has been recognised to reduce re-consultation rates in practice (Little, 2016). NICE (2008), gives clear guidance for the use of DPA for RTI, however when applying it into practice there is no agreed protocol recognisedand the strategy is left to the discretion of the individual clinician**.** This is a distinct challengeto itsapplication, however the use of appropriate communication skills, comprehensive documentation and governance, robust safety netting, continuing education of clinicians and patients allows for its safe and effective management in practice.

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