This case study describes the challenges of treatment strategies for a 63-year-old lady with a 38-year-history of bronchiectasis. She has been managed previously with 6-8 weekly prophylactic intravenous (IV) antibiotics during elective admissions to hospital, yet under new consultant care it is felt that this management is inappropriate and her time spent in hospital excessive. This report reflects upon the challenges of delivering patient-centered care for chronic conditions in a ‘cash-strapped’ NHS. The discussion analyses the patient’s disease progression and turns to review the current evidence base for prophylactic antibiotic treatment of bronchiectasis.

BACKGROUND
This case is of particular interest as it is a good illustration of a clash in the desires of a ‘professional’ patient and a physician’s judgment. Shared decision-making between doctors and patients is vital; Andrew Lansley famously coined the slogan ‘nothing about me, without me’ reflecting the ‘triumph’ of autonomy and the fact that ‘medical paternalism no longer rules’. However, achieving this end-goal is not always simple, and further complicated by the current economic strain on the NHS.

It is also an example where different doctors have had contradictory opinions on how the same patient should be managed, arguably highlighting the need for a strong evidence base upon which to base treatment strategies. Establishing guidelines for antibiotic therapy for non-cystic fibrosis (CF) bronchiectasis has been a challenge. The evidence supporting its diagnosis, investigation, but above all management, has been largely empirical, and the condition has been the focus of comparatively few controlled clinical trials. This case thus highlights the gap in evidence and gives direction for future research.

CASE PRESENTATION
A 63-year-old woman with known bronchiectasis came into hospital on an elective basis for a course of IV antibiotics. The patient contracted tuberculosis when seven years old and experienced recurrent chest infections, subsequently being diagnosed with bronchiectasis when twenty-five years old. This has considerably affected her life, worsening particularly over the past fifteen years. She monitors her sputum and uses physiotherapy techniques daily.

She was managed under the same consultant for thirty years, who eventually established a routine of elective 6-8 weekly hospital admissions for prophylactic IV antibiotic therapy. This management is now considered unnecessary and inappropriate by her new consultant, who is attempting to wean her from her dependence on elective admissions. Understandably this is a challenge; her social life has revolved around these admissions, she trusted her previous consultant who established this routine, and she associates lack of elective admissions with a decline in her health.

Figure 1 summarises her relevant history and documents notable changes in her management and exercise tolerance: Since 2007 she has had a total of forty-two hospital admissions, which average at ten days duration each. Thirteen of these have been emergency admissions for exacerbations, the remainder for elective antibiotic administration (see Figure 2).

Figure 1. A table documenting the progression of the patient’s disease.

Figure 2. Graph documenting number of hospital admissions (elective and exacerbations).
On this admission to hospital the patient felt generally well, yet appreciative of being able to rest. Her baseline symptoms include constant chest pain like an ‘elastic band’ whilst breathing. She becomes short of breath with very mild exertion—performing tasks such as washing herself. Review of systems revealed that she experiences recurrent oral thrush infections, dry mouth, palpitations, stomach pain and restless legs. She attributes most of these to medication side effects. Other medical history includes asthma, depression, osteoporosis, and osteoarthritis. She suffered from a low impact right mid-foot fracture in 2011, associated with osteoporosis and long-term steroid use. The patient takes the regular medications (see Figure 3).

Both of her children have asthma. She lives alone in a house and is a non-smoker and non-drinker. Whilst independent with activities of daily living, it can take her up to an hour to get dressed and she is sometimes too tired to make herself a cup of tea. She finds it tough to cope and is worried about what the future holds. She feels that her treatment options are becoming narrowed and that her exacerbations are more frequent and harder to predict, saying that she never knows if she will ‘wake up with raging pneumonia’.

**INVESTIGATIONS**

The patient had bloods taken on admission, including FBC, U&Es, LFTs and CRP. She was found to have slight neutropenia: 1.63x10⁹ (Normal 1.8-7.5 x10⁹/L). This was not regarded as significant, considering her October 2013 review by the immunologist who found no immunodeficiency.

She had a chest X-Ray taken (Figure 4 – note the portal catheter), which demonstrated changes consistent with bronchiectasis. Compared to previous radiographs, even dating to 2006 (Figure 5), no change or new lesions were seen.

The patient also had a bronchoscopy and washings performed for microscopy & sensitivity. No cultures were grown.

**TREATMENT**

The patient completed a 7-day course of Tazocin (4.5g, TDS, IV) and was seen by the physiotherapy team for chest clearance.

**OUTCOME AND FOLLOW-UP**

The patient’s stay in hospital was largely unremarkable. She was discharged as planned; a follow-up appointment was booked in clinic in 6 weeks.

**DISCUSSION**

Cole first proposed the ‘vicious cycle’ hypothesis of bronchiectasis in the 1980s—that initial airway insult leads to inflammation and damage, disordered mucociliary clearance and predisposition to further infection and inflammation. It is widely regarded that the key of bronchiectasis’ management lies in preventing infections and exacerbations in order to break this cycle.

The latest British Thoracic Society Guidelines lay out the essence of treatment as being annual influenza vaccination, pharmacotherapy, chest physiotherapy and clearance, and antibiotics. Antibiotics are vital and have greatly improved prognosis; prior to antibiotics death could occur within 5 years. Antibiotic therapy can be sub-divided into exacerbation treatment and prophylactic treatment—the latter being the focus of this discussion. Based on consensual view, rather than on a specific evidence base, it is recommended that long-term antibiotics (oral or inhaled) be prescribed for patients with ≥3 exacerbations per year. The rationale behind prophylactic antibiotic treatment lies in an attempt to improve symptoms and reduce exacerbations. The likely mechanism behind this is hypothesized to be reduction of bacterial load and airway inflammation; it is also thought that long-term macrolide antibiotics have immunomodulatory benefits. The sequelae of reducing exacerbations include an improved quality of life; notably, exacerbations have been associated with higher levels of depression and anxiety.

However, the question of what prophylactic...
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strategy is ideal still remains. The most recently published guidelines emphasised that formulating recommended antibiotic regimens was a real challenge due to the deficient evidence base. The ‘surprising lack’ of research on bronchiectasis is dwarfed by the output on the more fashionable Cystic Fibrosis (CF). The authors of the guidelines felt that it was important not to simply extrapolate from the CF data. This is for good reason - in some instances trails of proven CF therapies have had deleterious results when applied to subjects with bronchiectasis. It was necessary therefore for the authors to draw from information gleaned in studies from the 1950s, open to the criticism that the studies have poor and outdated methodology.

Whilst there is consequently a call for ‘large multicentre trials to evaluate efficacy of different management options’, in January 2014 the Lancet heralded the ‘arrival of better evidence’ and reported the findings of recent randomised-controlled trials. To highlight a few examples: Murray et al. studied the efficacy of twice daily nebulised gentamycin over a period of months, randomising sixty-five patients to gentamycin or placebo. Whilst there was no improvement in lung function, the group receiving gentamycin doubled the time to next exacerbation (from 61.5 to 120 days) and experienced an increase in exercise tolerance and quality of life. Significantly, pseudomonas aeruginosa was eradicated in 30.8% of cases, and other pathogens in 92.8%. Similarly studies have shown that nebulised drugs such colonymycobacterium and tobramycin can reduce symptoms, decrease hospital admission time and eradicate pathogens. However, as McDonnell notes, recurrence of colonisation of pseudomonas aeruginosa when treatment is withdrawn is ‘almost universal’.

Altenburg et al. conducted a multicentre Dutch trial of eighty-one patients to examine the efficacy of low-dose azithromycin over a twelve-months period. This drug has gained attention for its immunomodulatory benefits, and the study showed reduction in exacerbation frequency (1.28 per year, P = 0.004) and health-related quality of life (assessed by validated questionnaire, P = 0.006). However, there can be no denial of the study’s limitations: the small study size and consequent lack of generalisability, and as it is not an RCT confounding factors will have influenced the findings. The participants were not blind to their exposure status, so a placebo effect could have resulted, and their report of their quality of life affected. The study nonetheless paves the way for future trials, especially considering the impressive statistic of saving 1020 bed days and £357,000.

Nevertheless, given the complexity of human nature, no number of clinical trials will tell us exactly what is appropriate for this individual patient. The answer, as with most conflict, most probably lies in compromise and communication. There can be no denial that even if prophylactic IV antibiotic therapy was giving her significant therapeutic benefit, despite the lack of concrete evidence base for such a strategy, it would be rational to save bed days and costs by delivering this treatment at home. Yet the issue of her psychological and social dependence on admission would still exist. Simple cessation of this routine risks jeopardising the crucial doctor-patient relationship. She needs to be given social support, true acknowledgement of her concerns, and thorough explanation of the rationale behind any changes in her trusted regimen.

TAKE HOME MESSAGES

The management of patients with chronic conditions poses a challenge for healthcare professionals, especially considering the economic strain on the NHS. Formulating guidelines as how best to give prophylactic treatment for bronchiectasis has been difficult. Current strategy is based largely on consensus view; the gaps in the evidence base highlight areas for future research. Guidelines cannot provide perfect solutions, irrespective of evidence base. Patients, being human, are complex, and management strategies have to evolve and be sensitive to this. Shared-decision making between doctors and patients is key. When differences in opinion arise between patient and doctor, good communication and holistic management are vital.

REFERENCES AND NOTES


For the purposes of this report non-CF bronchiectasis will be simply referred to as ‘bronchiectasis’.


