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SHORT RESEARCH REPORT

Infectious diseases physician attitudes to long-term antibiotic use

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Abstract

Background In Australia, it is not known how much antibiotic prescribing by infectious diseases physicians is long-term, or how confident they are with the evidence behind this practice. *Objective* Survey Australian infectious diseases physicians to assess attitudes and prescribing practice prescribing prolonged courses of antibiotics. *Methods* An online questionnaire was distributed to the mailing group for the Australian Society of Infectious Diseases. Responses were collected from 29th October to 12th November 2015. *Results* The majority of respondents practiced in Australia as Infectious Diseases physicians, microbiologists, or trainees. 88% had prescribed long-term antibiotics. Heterogeneity was noted in the indications for prescription, including recurrent UTIs, cellulitis or chest infections, prosthetic joint infection and vascular graft infection. Beta-lactams antibiotics were prescribed most frequently. 22% of respondents had prescribed rifampicin/fusidic acid most frequently, while 11% could not identify a single antibiotic that they used most frequently, due to the heterogeneity of indications for prescribing. 95% stated that they would stop long-term antibiotic therapy if appropriate, and 74% were willing to enrol their patients into a randomised control trial looking at stopping long-term therapy. *Conclusion* Most infectious diseases physicians who responded to the survey prescribe long-term antibiotics, with great heterogeneity in the indications for which these antibiotics are prescribed.

Keywords Antimicrobial stewardship · Antimicrobials · Australia · Infectious diseases specialists · Long term prescribing · Questionnaire

Impacts on practice

- The majority of infectious diseases physicians in Australia prescribe long-term antibiotics.
- In Australia, there is great heterogeneity in indications for long-term antibiotic prescribing, and this is reflected in variation in antibiotics prescribed.
- For patients, the relationship between the benefits and costs of being placed on long term antimicrobials may be quite unclear with consequent difficulty for health care workers in deciding on treatment and in counselling those patients.

Introduction

Antibiotics are generally used for short-term treatment of active infections. Evidence also supports their long-term use as prophylaxis for infection in the setting of immunosuppression after transplantation [1], recurrent urinary tract infections (UTIs) [2, 3] or splenectomy [4]. Long-term antibiotics are also prescribed with less evidence as suppressive therapy for infected prosthetic material not amenable to removal such as prosthetic joint infections [5], or infected cardiac devices [6]. Concerns regarding these practices include risks of potential side-effects, which may only become apparent with long-term use, and the emergence of antibiotic resistance in colonizing organisms. The attitudes and practices

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of infectious diseases physicians prescribing long-term antibiotics have not previously been formally investigated. When we investigated long-term antibiotic prescribing practices within our own institution [7], a healthcare network servicing South-East Metropolitan Melbourne, indications included PJP prophylaxis, suppression in setting of infected prosthetic material, and utilization of anti-inflammatory properties in cystic fibrosis. We sought to explore prescriber attitudes and practices on a wider spectrum.

Aim of the study

The aim of this cross-sectional survey was to assess infectious diseases physicians' attitudes towards prescribing and indications for long-term antibiotic use.

Ethics approval

The study was approved by the Monash Health Human Research Ethics Committee (approval number 14379a), consequent to a larger study of patients receiving long-term antibiotics [7], which we defined as a duration of greater than 12 months, known as SOLLA (study of life-long antibiotics).

Method

Data was collected via an online questionnaire, which we developed to capture respondent demographics and details of long-term antibiotic prescription, including frequency, indications for prescription, most commonly prescribed antibiotics, patient follow-up and side-effects. It was tested amongst infectious diseases specialists, both involved and not involved with the study prior to dissemination. Questionnaires, hosted on the online platform Survey Monkey [8], were distributed to an online mailing group for the Australasian Society of Infectious Diseases (ASID), known as 'Ozbug' [9, 10]. This group consists of over 800 subscribed members comprising infectious diseases physicians, clinical microbiologists, public health physicians, trainees and other clinicians involved in the field of infectious diseases, working in both hospital and community practice. A second reminder email was circulated 1 week following the initial questionnaire release.

Responses were collected from October 29th to November 12th 2015. A descriptive analysis was performed on collated results.

Results

Of the 130 respondents, 109 (84%) practiced in Australia, 10 (8%), practiced in New Zealand 10 (8%) in Singapore and 1 (< 1%) in the United States of America. The majority, 109 (84%), worked as Infectious Diseases physicians, microbiologists or trainees in these fields.

One hundred and fourteen (88%) respondents had previously prescribed long-term antibiotics. Twenty-Seven (21%) only made this type of prescription once per year, 63 (50%) between 2 and 5 times per year, 15 (12%) between 6 and10 times per year and 9 (7%) more than 10 times per year. Fifty-seven (50%) of prescribers personally followed up the patients they had commenced on long-term antibiotics.

Reported indications for long-term antibiotic prescriptions were heterogeneous and included recurrent UTIs, recurrent cellulitis, recurrent chest infections, prosthetic joint infections and vascular graft infections. Choice of antibiotic agent was correspondingly diverse (Fig. 1), with beta-lactams, including flucloxacillin, ampicillin and cephalexin, being the most commonly prescribed agents overall (55/106, 52%). Twenty-three respondents (22%) stated they used the combination of rifampicin/fusidic acid most commonly, whilst 12 (11%) could not identify a single agent most commonly used.

Regarding noted side-effects, 68 (63%) respondents could identify a most common side effect attributable to long term antibiotics. Gastrointestinal sequelae such as nausea, vomiting and diarrhea were most frequently attributed to the prescription of long-term antibiotics, being identified by 57 (53%) respondents. Other reported side-effects included pruritus and other non-life threatening complaints. Side-effects were most commonly attributed to prescription of rifampicin in combination with fusidic acid (39, 41%).

Of the 130 respondents 111 (95%) stated they would stop patients' long-term therapy if appropriate and 87 (74%) would be willing to enroll their patients into a randomized controlled trial investigating outcomes of cessation of their antibiotic therapy.

Discussion

We performed a cross sectional survey of infectious diseases physicians' practices and attitudes towards long-term antibiotic prescribing. We found that the majority of infectious diseases physicians, prescribe long-term antibiotics, and despite this, feel that they need more guiding evidence behind their common practice. As observed from

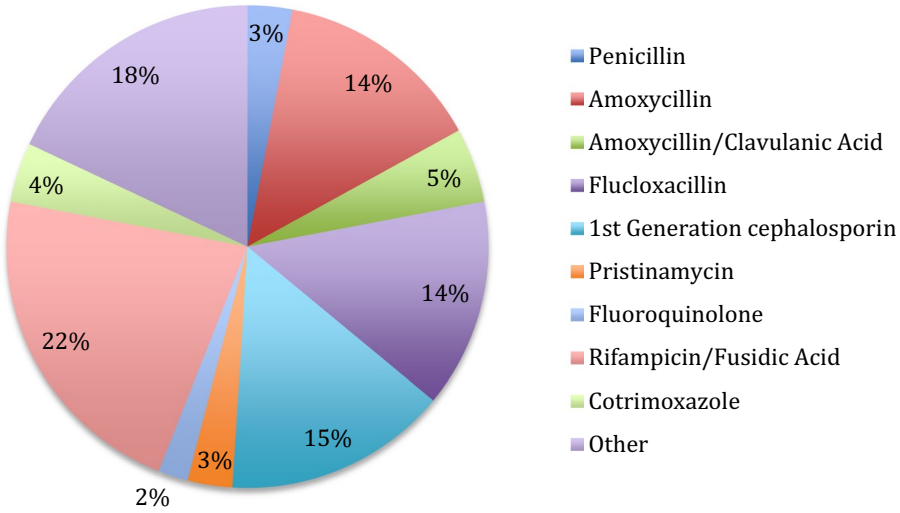

Fig. 1 Proportion of long-term antibiotics prescribed by physicians

our previous study of our own organization on long-term antibiotic prescribing [5], there was widespread variability in practice, with varying indications and antibiotics used. Again this may be attributed to the lack of guiding evidence as well as heterogeneity in indications and organisms. In addition, the response rate is relatively low, and may itself be subject to bias between responders and non-responders suggesting there may be even further heterogeneity than demonstrated by this study.

There is awareness of the pitfalls of this practice, with those prescribing also recognizing side-effects experienced by their patients, as well as the potential for antimicrobial resistance with more liberal use of antibiotics.

A key strength of this study is that to our knowledge it is the first study detailing infectious diseases physicians' attitudes toward long-term antibiotics. It is however limited by the potential for selection bias, with voluntary respondents more likely to be interested in long-term antibiotic use, and sought responses from a single specialty. Additionally it is not known how many members of the mailing list regularly engage with the content, or the overall response rate. Nevertheless, the heterogeneity of practice amongst respondents reflects the paucity of guiding research.

With the varying indications for long-term antibiotic usage, and the differing choices of antibiotics, it is understandable that executing controlled trials to further inform practice would be difficult. Clinical and microbiological case definitions would have to be strictly defined to reduce heterogeneity, and trials would likely need to be large and multi-centered to achieve necessary case numbers to produce significant results. An example of such a study in our context would be to stop fusidic acid and rifampicin therapy, given evidence of decreased levels of fusidic acid when combined with rifampicin [11], in those with a prosthetic joint infection after a specified duration of therapy, and measuring clinical and microbiological evidence of recurrence or lack thereof within a defined period e.g. 1 year. Our study of infectious diseases physicians' attitudes demonstrates demand for this research from the clinicians who engage with this practice due to the recognized short-falls, and is reflected by respondents being willing to enroll their patients in studies of ceasing long-term antibiotics, indicating capacity for future research into an area with limited evidence.

Additionally, commonly prescribed antimicrobials combinations may be potentially ineffective or harmful. Clinical data is important to elucidate in vivo efficacy and determine consequences of long-term antibiotics that may only be observed in large cohorts or other post-marketing studies.

Conclusion

As previously observed within our own institution, the practice of prescribing of long-term antibiotics is heterogeneous and common amongst infectious diseases physicians. Amongst this cohort, there is a clear demand for more guiding evidence for this practice. Currently this information is limited [12] both in the volume of research on the topic and as a consequence the availability of good evidence based guidelines.

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Conflicts of interest There are no conflicts of interest amongst those involved in the study.

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