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Short Communication

Prescribing practices for intravenous aminoglycosides in UK Cystic Fibrosis clinics: A questionnaire survey

Alan R. Smyth *, Emma L. Campbell

Division of Child Health, Obstetrics and Gynaecology, School of Medicine, University of Nottingham, Nottingham NG7 2UH, UK

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Abstract

Background: Intravenous aminoglycoside antibiotics are widely used to treat pulmonary infection with *Pseudomonas aeruginosa* in individuals with cystic fibrosis (CF). Over the last decade evidence has accumulated showing that the choice of aminoglycoside and the dosing regimen may help reduce adverse effects such as nephrotoxicity.
Methods: We undertook an online survey to determine current practice in UK CF Centres.
Results: We received a response from 35/48 (73%) centres. A once daily regimen was used in 30/35 (86%) centres. Around one third had stopped using gentamicin in the last 10 years. In most cases respondents reported changing practice in response to new evidence or evidence based guidelines. Obstacles to introducing evidence based practice were identified both at the level of the CF Centre and the hospital trust.
Conclusions: A once daily aminoglycoside regimen is now used in the majority of UK CF Centres. Tobramycin is first line and many centres have stopped using gentamicin. Obstacles to evidence based practice remain in a minority of centres.

Keywords: Cystic fibrosis; Aminoglycosides; Nephrotoxicity; Once daily dosing; Obstacles to evidence based practice

1. Introduction

Aminoglycoside antibiotics are widely used for the management of pulmonary exacerbations in cystic fibrosis (CF) due to *Pseudomonas aeruginosa*. In the UK around one third of CF patients receive intravenous antibiotics in a year, for a median of 23 days [1]. Aminoglycosides are recommended as first line therapy [2] and so CF patients are vulnerable to adverse effects, such as nephrotoxicity. The risk of acute kidney injury (AKI) is greater in CF than in the general population (100 times greater in children) and most episodes are related to aminoglycosides [3]. There are a limited number of antibiotics which are active against *P. aeruginosa* and so clinicians will continue to use intravenous aminoglycosides. However there is good evidence that nephrotoxicity may be reduced by using a once daily regimen [4] and by avoiding the use of gentamicin [3]. This evidence has informed recommendations in treatment guidelines both in the UK [2] and in the US [5]. Indeed the guideline recommendation on aminoglycoside use has been highlighted as one of the few which is evidence based [5]. We therefore chose to evaluate adherence to this recommendation as an example of guideline adherence in CF. A decade ago, we conducted a survey of aminoglycoside prescribing practices in UK CF centres which showed low uptake of these strategies [6]. We wanted to know whether practice has changed in the light of evidence from recent research and so we repeated this survey.

2. Methods

We contacted the Centre Director for all UK CF centres by email (using a contact list provided by the UK Cystic Fibrosis Trust) and invited them to complete an online questionnaire (Fig. 1) which asked about aminoglycoside prescribing practices in their centre. Answers could be yes/no; choose one option; choose one or more options; or free text, depending on the

* Corresponding author. Tel.: +44 115 823 0612; fax: +44 115 823 0626.
E-mail address: alan.smyth@nottingham.ac.uk (A.R. Smyth).

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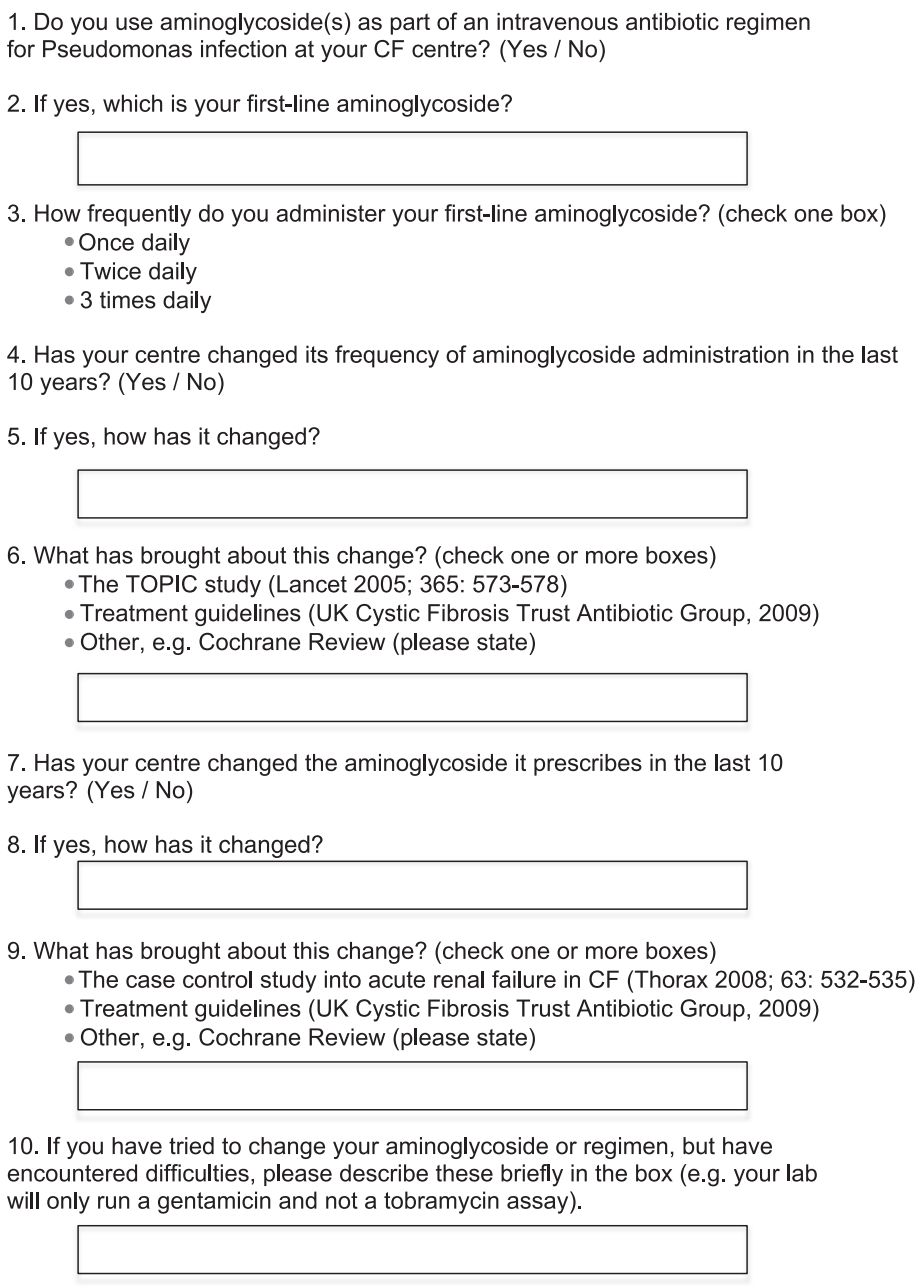

Fig. 1. Online questionnaire.

context of the question. Invitation emails were sent in March 2013 and a follow up to non-responders was sent a month later. The online tool captured the email address of the respondent and so duplicate responses from the same centre could be identified. Where there was more than one response from the same centre, we used the first response only. The questionnaire (Q1-3) asked specifically about first line antibiotic therapy for *P. aeruginosa* (the commonest indication for aminoglycosides in CF). This was to avoid confusion with aminoglycosides given for other indications such as intravenous amikacin for infection with *Mycobacterium abscessus*, where a twice or three times daily regimen is recommended [2].

3. Results

We received a response from 35/48 (73%) centres, of which 21/35 (60%) were paediatric and 14/35 (40%) were adult. Replies came from centres in England, Scotland, Wales and Northern Ireland. All centres reported using an aminoglycoside as part of an intravenous antibiotic regimen for infection with *P. aeruginosa* (Q1) and all named tobramycin as their first line aminoglycoside (Q2).

Results for Q3–Q9 by paediatric and adult centre separately are given in Table 1. A once daily aminoglycoside regimen was used by 30/35 (86%) centres; twice daily by 1/35 (3%), and