Increasing burden of antimicrobial resistance in pseudomonas aeruginosa from adult patients with cystic fibrosis (CF) in Northern Ireland: Then and now

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LETTERS

INCREASING BURDEN OF ANTIMICROBIAL RESISTANCE IN PSEUDOMONAS AERUGINOSA FROM ADULT PATIENTS WITH CYSTIC FIBROSIS (CF) IN NORTHERN IRELAND: THEN AND NOW

Editor,

Cystic fibrosis (CF) is characterised by defective mucociliary clearance and chronic airway infection. The most commonly isolated pathogen from CF airways is a Gram-negative bacterium, *Pseudomonas aeruginosa* (PA). Chronic PA infection is associated with significant morbidity and mortality in CF patients and necessitates multiple antibiotic courses. Antimicrobial resistance (AMR) in PA may be driven by the exposure of bacterium to antibiotic, either in the acute setting or during anti-pseudomonal chronic suppressive therapy. We examined AMR from PA isolates from a single adult CF centre, by comparing antibiotic susceptibility from contemporary isolates with a collection from 13 years ago.

Two collections of PA isolates were examined, each consisting of 100 non-duplicated organisms, which had isolated from the sputum of adult CF patients attending the Northern Ireland Adult Cystic Fibrosis Centre, Belfast City Hospital. Collection A was isolated during the period 1996-2001 and Collection B (2015-2016). Microbiological isolation of PA was performed from freshly expectorated sputum, by employment of selective culture for 24-48h, followed by biochemical confirmation with API20NE identication strips (Biomerieux Ltd, UK). Antibiotic susceptibility was performed on each isolate by standard disk diffusion assay and strips (Biomerieux Ltd, UK). Antibiotic susceptibility was interpreted against published CLSI data (S, I &R) from disk diffusion assay. However, RRI and AMR increased significantly for ciprofloxacin (p<0.0001)***, aminoglycosides (both amikacin and tobramycin, p<0.0001)*** and meropenem (p<0.0001)*** for PA isolates from 1996-2001 to 2015-2016. There was reduction in AMR during this period with piperacillin/tazobactam and ceftazidime.

Overall, this study showed markedly greater resistance in the 2015-2016 PA cohort. Increase in AMR may reflect chronic exposure of PA to several classes of antibiotics used in the management of CF airways infection. Until now, it has been relatively difficult to perform comparative studies on AMR in CF, due to the reliance on generating largely qualitative data (S, I &R) from disk diffusion assay. However, RRI may help tracking changes in resistance patterns either at a population level or at an individual patient level, either with a single antibiotic agent, several agents within a single class or collectively between antibiotic classes.

This approach may be useful in helping to track emergence in AMR epidemiologically, those agents which display the greatest shift in AMR, as well as helping to guide antimicrobial stewardship practices and policies in CF.

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