Susceptibility to Respiratory Fluoroquinolones in Streptococcus pneumoniae in Toronto, Canada

A. McGeer1, K. Green1, G. Tyrrell2, D. E. Low1, on behalf of the Toronto Invasive Bacterial Diseases Network (TIBDN)
Mount Sinai Hospital1, Toronto, ON, National Center for Streptococcus2, Edmonton, AB

Abstract

Background: Fluoroquinolone resistance (FQR) emerged in S. pneumoniae (SPN) shortly after the introduction of ciprofloxacin. FQR increased from 1995 to 2002, and by 2002 was clinically significant in the elderly, and those with recent exposure to FQ and healthcare institutions. We examined trends in FQR in SPN in at-risk populations in Toronto since 2002.

Methods: Since 1995, TIBDN has collected all SPN isolated from sterile sites in residents of Toronto/Peel (pop 4M); from 2002, respiratory tract isolates were collected and the population area expanded. Both broth microdilution susceptibility testing to CLSI standards is performed on all isolates. Pop’n FQ use is obtained from IMS Health. Demographic and medical data were collected from patients.

Results: From 1995-2008, FQ use increased from 67 to 875 prescriptions/1000pop/year between 1995 and 2007, and has remained stable since (Figure 1). Formulary restrictions in the provincial drug benefit formulary resulted in a decrease in ciprofloxacin use between 2000 and 2001; use has since increased to pre-restriction levels. In 2009, levofloxacin usage was 11.7 prescriptions per 1000, and moxifloxacin use was 16.9 prescriptions per 1000 population.

Introduction

The Toronto Invasive Bacterial Diseases Network (TIBDN) has performed population-based surveillance for invasive pneumococcal disease in metropolitan Toronto and Peel region (pop 4M) since January 1, 1995. The emergence of fluoroquinolone resistance in S. pneumoniae from 1995 to 2002 was associated with older age, recent use of FQ, and hospital/nursing home-acquired infection. We examined trends in fluoroquinolone resistance in SPN in Toronto since 2002 and re-examined these previously identified risk factors.

Methods

From 1995 to 2009, all sterile site isolates of pneumococci identified through population-based surveillance for pneumococcal disease in Metropolitan Toronto and Peel region were collected. From 2002 to 2009, all respiratory site isolates from hospital laboratories were also collected. Both broth microdilution antimicrobial susceptibility testing was performed to CLSI standards. Population fluoroquinolone use was obtained from IMS Health Canada. Demographic and clinical data were collected from review of health records and interviews with patients and accompanying physicians. Details of previous antibiotic treatment has been collected since 2000. Patients currently on antimicrobials or who finished a course of antibiotics within 48 hours of positive culture were classified as failing therapy.

Acknowledgements: We are grateful to the infection control practitioners, microbiology technologists, public health staff and our tireless TIBDN staff for their ongoing contributions to this surveillance. This work has been supported in part by an unrestricted grant from Bayer Healthcare AG.