Increased erythromycin resistance in clinical Campylobacter in Northern Ireland—an update

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Keywords: poultry, pigs, macrolides, antibiotic resistance, zoonosis

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Sir,

Thermophilic campylobacters, particularly Campylobacter jejuni, Campylobacter coli and Campylobacter lari, continue to remain the most common cause of acute bacterial enteritis in Northern Ireland, with ~743 laboratory reports per annum (equating to circa 44 cases per 100 000 population) and where the trend has been decreasing since 2000 (Figure 1).¹ Previously, we have reported trends in antibiotic susceptibility in these organisms for the period 1980–2000.² However, since 1999, we have noted a trend in increasing resistance (0.4%–11.3%) to erythromycin in isolates obtained from clinical faecal material.

Human isolates were obtained from faecal specimens submitted to the Northern Ireland Public Health Laboratory for routine analysis from general practitioners in the community, as well as from hospital wards over the period 2001–2003 (n = 703). Isolates were obtained by direct selective plating onto Preston’s selective agar and incubated at 42°C for 48 h. Antibiotic susceptibility studies were performed at 37°C for human isolates by the standard disc diffusion. The following antibiotic agents were employed at the given disc concentrations: penicillin (2 μg), cefalexin (30 μg), erythromycin (15 μg), chloramphenicol (10 μg), gentamicin (10 μg), tetracycline (10 μg) and ciprofloxacin (1 μg), as previously described.³

With the exception of erythromycin, susceptibility to the other antibiotics has remained relatively static over this period, most notably in relation to resistance to ciprofloxacin (13%). It is especially noteworthy that ciprofloxacin susceptibility has remained stable despite the widespread prescription of quinolone antibiotics. However, from 1999, there has been an increasing trend in erythromycin resistance, rising to 11.3% resistance in 2002, as shown in Figure 1. In concert with this, there has been a concurrent rise in erythromycin resistance in isolates originating from poultry in Northern Ireland, rising to 15.3% resistance in 2002 (Figure 1), and where there has been no other marked increase in antibiotic resistance levels in poultry isolates, [2003 data; tetracycline (16.4%); chloramphenicol (5.5%); nalidixic acid (3.8%); gentamicin (0%)]. Such patterns are in contrast with those reported for the USA,³ Pakistan⁴ and the Republic of Ireland,⁵ where rates of erythromycin resistance in clinical campylobacters remain unchanged at ~2%.

Although the number of laboratory reports of clinical Campylobacter has been decreasing in Northern Ireland, on average, 9.4% per annum since 2000, the frequency of erythromycin-resistant isolates has been increasing, to a maximum value of 11.3% resistance, as was recorded in 2002. Although antibiotic therapy is not normally given for this usually self-resolving infection, where antibiotic intervention is required, oral erythromycin is the first-line treatment. Therefore, any increase in resistance levels to the first-line treatment option is worrying and necessitates an exploration of the potential sources of acquisition of such resistant organisms in the local food chain. However, it is important to note that all clinical isolates remain susceptible to gentamicin.

Concurrent with a rise in the resistance levels in human faecal isolates, there has been a rise in resistant rates in campylobacters originating from poultry, suggesting a possible association between the poultry and human isolates. The presence of macrolide resistance in poultry isolates in Northern Ireland is in contrast to other countries, where such data are available, including Russia, where Stern et al.⁶ recently described erythromycin resistance in poultry to be < 1%. Alternatively, it has been reported previously⁷ that the local pig population harbours a high-level resistant C. coli phenotype, which may be the cause of this increase in the frequency of human erythromycin-resistant campylobacters. In the previous study by Moore et al.,⁷ these workers demonstrated the presence of C. coli isolates taken from pigs at slaughter, where the MIC of erythromycin was > 500 μg/mL. Indeed, this high-level erythromycin resistance observation in C. coli originating from pigs is not unique to Northern Ireland, as similar observations have been made in North America.

Figure 1. Trends in erythromycin resistance levels in human faecal isolates (thin continuous line), poultry isolates (broken line) and total laboratory reports for Northern Ireland (thick continuous line), over the period 1997–2003.

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Erythromycin-resistant *C. coli* has been also observed in the USA, where Wang et al.\(^3\) demonstrated that 27% of pig strains were resistant and Taylor & Courvalin\(^3\) demonstrated high-level erythromycin resistance in strains of *C. coli*. More recently, Payot *et al.*\(^9\) showed the presence of resistant organisms isolated from fattening pigs in France, where erythromycin resistance was described to be 55%, with all isolates examined being *C. coli*.

Few laboratories in the UK identify their isolates to species level and fewer still utilize any of the recognized typing schemes. The combined consequences of these is that there is scanty information about the frequency and distribution of strain types that cause human infection and where they are to be found in the food chain. Hence, it may be important for laboratories to consider speciating such erythromycin-resistant isolates, to help in epidemiological investigations to identify potential animal sources, where such isolates may have originated.

Further work is therefore required to help ascertain the origins of the erythromycin resistance in these campylobacters, and careful monitoring/surveillance is also important to help observe resistance trends, so that increasing trends in resistance do not begin to impact on current antibiotic policies.

**Acknowledgements**

This study was funded by the Research & Development Office, Department of Health & Public Safety, Northern Ireland [Infectious Disease—Recognised Research Group (RRG) 9.9].

**References**


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Keywords: carbapenems, *Streptococcus pneumoniae*, France, bacteraemia

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Sir,

*Streptococcus pneumoniae* is the most common cause of infections of the lower respiratory tract in adults and children. In Europe, France has the highest rates of penicillin and erythromycin resistance in pneumococci: in 2002, 53% and 58% of the strains were found to be non-susceptible to these antibiotics, respectively.\(^1\) In American guidelines (but not in French guidelines), ertapenem, a newly licensed parenteral carbapenem, constitutes an alternative to the usual parenteral β-lactams for inpatients with pneumococcal infection.\(^2\) The purpose of this national multicentre study was to report the *in vitro* susceptibility to ertapenem and comparator compounds of *S. pneumoniae* isolated from French adults suffering from bacteraemic pneumonia.

Between 2000 and 2003, 339 strains of *S. pneumoniae* were collected by The ColBVH Study Group, a network of 105 non-teaching hospitals representative of general hospitals in France. These non-duplicated isolates were from blood cultures from hospitalized adults with pneumonia and were sent to a central laboratory (Service d’Hygiène, Centre Hospitalier de Versailles). The MICs of ertapenem, and penicillin G, amoxicillin, cefuroxime, cefotaxime, ceftriaxone, imipenem, erythromycin,