



## Short Communication

### Gram negative Enterobacilli; antimicrobials with special reference to azithromycin

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## ABSTRACT

### Keywords

Azithromycin;  
Gram negative  
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quinolones.

In this study 300 gram negative enteric bacilli, isolated from various samples, were processed for the antimicrobial response. Amikacin was quite effective for all these pathogens and azithromycin was found out to be a better choice for treating invasive gastrointestinal microbes i.e., *Salmonella* and *Shigella*.

## Introduction

The members of the family Enterobacteriaceae remain the predominant isolates obtained during the culture of varied clinical specimens. Moreover their treatment is becoming challenging day by day because of the emergence of numerous resistant strains against commonly used antimicrobials, particularly in the developing nations (Murray, 1986). Erythromycin is an antibiotic that was commonly in use to treat the infections caused by gram negative enteric pathogens (Andremont *et al.*, 1983). But we come across frequent gastrointestinal side effects caused by it. At present azithromycin is in frequent use to treat gram negative enteric bacilli

because of its lesser adverse effects and for possessing a broader spectrum of activity.

The present study, conducted in the year 2009, includes in total 300 gram-negative enteric bacilli, isolated from various clinical samples received for culture and sensitivity testing. Equal number of isolates were picked up from the three leading laboratories in Ludhiana namely Microbiology Laboratory, Christian Medical College and Hospital Ludhiana, Microbiology Laboratory, Oswal Cancer Hospital Ludhiana And Microbiology Laboratory, Dr.LalPath Labs Ludhiana. Standard techniques were followed during

**Table.1** Antibiotic susceptibility pattern (No. of Sensitive Isolates with Percentage)

Isolates	Cf	Gf	Ce	Ci	Cp	At	Ak
<i>E.coli</i>	22450 ( 22.32)	156 (69.64)	40 (17.86)	44 (19.64)	43 ( 19.20)	32 ( 14.29 )	164 (73.2)
<i>Klebsiella</i>	3016 ( 53.33)	21 (70.00)	08 ( 26.67)	08 ( 26.67)	10 ( 33.34)	17 ( 56.67)	32 ( 93.75)
<i>Salmonella</i>	217(80.95)	20(95.24)	19 (90.48)	17 (80.95)	17 ( 80.95)	19 ( 90.48)	16 ( 76.19)
<i>Shigella</i>	14 09 (64.29)	09(64.29)	07 (50.00)	08 (57.14)	09 (64.29)	12 ( 85.71)	08(57.14)
<i>Enterobacter</i>	53(60.00)	02(40.00)	04 (80.00)	04 (80.00)	03 (60.00)	03 (60.00)	04 (80.00)

Cf-Ciprofloxacin, Gf-Gatifloxacin, Ce-Cefotaxime, Ci-Ceftriaxone, Cp-Cefoparazone, At-Azithromycin, Ak-Amikacin

culture of the specimens (Betty *et al.*, 2002) and for the identification of the isolates (Betty *et al.*, 2002) Kirby Bauer Disk Diffusion Method was used for studying the antimicrobial susceptibility pattern of these isolates (Mastesen *et al.*, 1969).

Out of 300 isolates belonging to the family Enterobacteriaceae, *Escherichia coli* was predominant i.e. 74.67% (224/300) followed by *Klebsiella* 10% (30/300). *Salmonella*, *Shigella* and *Enterobacter* isolates were 7%, 4.67%, and 1.67% respectively.

It is evident from the table1.that there is varied response of various microbes for different antibiotics. The antimicrobial susceptibility testing showed that *E.coli* and *Klebsiella*, the two predominant isolates were quite sensitive towards amikacin. The response of cephalosporins for various gram-negative enteric isolates was not encouraging because of high prevalence of ESBL producing pathogens in this group. Fluoroquinolones are also showing moderate level of susceptibility towards various pathogens. But

gatifloxacin showed 95.24% effectivity to treat Salmonellosis, which is encouraging. If we focus upon azithromycin it appears to be highly effective for *Salmonella* and *Shigella* species; but is least effective for *E.coli* isolates.

*Salmonella* and *Shigella* are quite common in various enteric infections and pediatric group is quite vulnerable to these microbes. Erythromycin cannot be used to treat invasive enteric pathogens like *Salmonella* and *Shigella* because of high minimum inhibitory concentrations (MICs).

Contrary to this azithromycin penetrates into the cells effectively and hence is a potent therapeutic agent against intracellular pathogens like *Salmonella typhi*. The ability of azithromycin to achieve intracellular concentration in monocytes is 231 times and in polymorphonuclear leukocytes is 83 times greater than that of serum concentration (Wildfeuer *et al.*, 1996). Moreover its dosage schedule i.e. once/twice a day is quite convenient for its administration.

The conclusion is to encourage the use of azithromycin for treating enteric fever as well as shigellosis; both being endemic infections in our developing nation.

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