Letter to Editor:

β-lactamase Production in Uropathogens

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Dear Editor,

β-lactamase production is the most common mechanism of β-lactam drug resistance in gram-negative bacteria.[1] Enterobacteriaceae producing both extended spectrum β-lactamases (ESBLs) and AmpC β- lactamases have been increasingly reported worldwide.[2] Until recently, carbapenems were the choice for the therapeutic management of multidrug-resistant gram-negative bacterial infections. Currently, the resistance to carbapenems in enterobacteriaceae is increasingly recognized.[3] For this reason, aggressive surveillance of β-lactamase producers will be extremely important. Here we present a study of β-lactamase production amongst gram negative bacterial uropathogens.

A prospective study was conducted at the Department of Microbiology, Indira Gandhi Government Medical College and Hospital, Nagpur, Maharashtra from July 2010 to November 2012. Amongst 1948 urine samples from community acquired (CA) and nosocomial urinary tract infection (UTI) processed, significant gram negative bacterial uropathogens include 320 enterobacteriaceae isolates (243 *E. coli*, 57 klebsiella, six citrobacter, 13 enterobacter and one *Proteus mirabilis*), 24 *Pseudomonas aeruginosa*, 45 acinetobacter and one isolate each of myroides spp, *Alcaligenes faecalis* and brevundimonas spp. ESBL and AmpC production was tested in all the enterobacteriaceae isolates. Carba-penemase produ-ction in enterobacteriaceae and non-fermentative gram negative isolates was tested.[4] The statistical analysis was performed by using chi-square test.

Amongst 392 isolates of enterobacteriaceae and gram negative non-fermentative bacilli, carbapenemase production was detected in 21 (5.4%) isolates. Amongst 320 enterobacteriaceae isolates, ESBL and AmpC production was detected in 29 (9.1%) and 10 (3.1%) isolates respectively.

There was no coproduction of β-lactamase (Table 1). As high as 15.8% β-lactamase production was seen in klebsiella.

Introduction of carbapenemase production in enterob-acteriaceae is a matter of great concern. Luckily they are mainly found in nosocomial strains and CA strains are spared till date.

The widespread use of antim-icrobials in community either due to self-medication or incorrect prescription is the possible factor fuelling the emergence of resistant strains. Therefore, careful monitoring of drug resistance and β-lactamase especially carbapenemase is

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necessary. It is a high time for microbiology laboratories to introduce β-lactamase testing routinely for the knowledge of their prevalence and for the measures to be taken to control their spread.

Table 1. β-lactamase production amongst uropathogens (n = 392)

Uropathogens (n1/n2)	ESBL producer (%)		AmpC producer (%)		Carbapenemase producer (%)		Total β-lactamase producer (%)		Sum total (%)
	CA	Noso.	CA	Noso.	CA	Noso.	CA	Noso.	
***E. coli* (173/70)**	0	23 (32.9)	0	7 (10)	0	3 (4.3)	0	33 (47.1)	33 (13.6)
***Klebsiella spp* (45/12)**	0	5 (41. 7)	0	2 (16.7)	0	2 (16.7)	0	9 (75)	9 (15.8)
***Citrobacter spp* (5/1)**	0	0	0	1 (100)	0	0	0	1 (100)	1 (16.7)
***Enterobacter spp* (10/3)**	0	1 (33.3)	0	0	0	1 (33.3)	0	2 (66.7)	2 (15.4)
***P. aeruginosa* (5/19)**	-	-	-	-	0	5 (26.3)	0	5 (26.3)	5 (20.8)
***Acinetobacter spp* (18/27)**	-	-	-	-	0	9 (33.3)	0	9 (33.3)	9 (20)
***Myroides spp* (1/0)**	-	-	-	-	1 (100)	0	1 (100)	0	1 (100)
Total (258/134)	0#*	29 (33.7)@*	0#*	10 (11.6)@*	1 (0.4)*	20 (15)*	1 (0.4)*	59 (44)*	60 (15.3)

CA – Community acquired, Noso. – Nosocomial UTI
*** - p < 0.05**
n1 - Total number of isolates in CA UTI
n2 - Total number of isolates in nosocomial UTI
 # - n1 = 234
@ - n2 = 86

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