

# ESBL carriage upon hospital admission: prevalence and risk factors

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## background

- Extended spectrum beta-lactamase producing Enterobacteriaceae (ESBL) are increasing worldwide.
- In recent years, a shift from infections with Klebsiella ESBL to E. coli ESBL was observed.
- At Meir Medical Center, we have observed a consistent rise in nosocomial E. coli ESBL blood stream infections despite contact isolation of patients with positive ESBL clinical cultures

## objectives

The aim of this study was to assess the additive value of surveillance cultures in identifying unknown ESBL carriers.

## methods

- We performed universal screening for ESBL of all new admissions, excluding the Pediatric and Obstetric Departments, during one week
- Rectal swabs were collected and sent to the Microbiology Laboratory for ESBL identification. Demographic and clinical data were collected for all patients from the hospital electronic data system.
- Multivariate analysis to identify independent risk factors for ESBL carriage was performed.

## results

### Prevalence

- 952 patients were admitted to the hospital from April 4-11, 2011.
- 525 (55.14% compliance) were screened for ESBL.
- 10.6% (56) were positive for ESBL, 41 (73.2%) samples were E. coli.

### Undetected Ratio

- 77% of positive patients did not have positive clinical cultures and were not known as previous ESBL carriers.

### Risk factors

- Four independent risk factors for current ESBL carriage were found:
  1. nursing home residency OR 2.8 (95% CI: 1.34-5.85),
  2. prior hospitalization at another hospital OR 3.0 (95% CI: 1.21-7.41),
  3. prior antibiotic treatment OR 3.31 (95% CI: 1.97- 6.59),
  4. prior ESBL carriage OR 4.19 (95% CI: 1.76- 10.01).

	ESBL carriers N 56	Non carriers N 469	P value
Female gender	29 (51.8)	238 (50.7)	0.88
age	68.86	65.73	0.69
Nursing home	18 (32.1%)	51 (10.9%)	0.000
Hospitalization in previous year	39 (69.6)	241 (51.4)	0.01
Hospitalization in previous year: Meir Medical Center	26 (46.4)	205 (43.7)	0.67
Hospitalization in previous year: another hospital	13 (23.2)	36 (7.7)	0.002
Operation in previous year	15 (26.8)	80 (17.1)	0.08
Previous ESBL carriage	12 (21.4)	22 (4.7)	<0.001
ESBL infection on current hospitalization	4 (7.1)	5 (1.1)	0.009
Length of stay current hospitalization	7.54	4.75	<0.001
Previous antibiotic treatment	37(72.5%)	169(44%)	<0.01
Previous antibiotic treatment- Cephalosporins	20(39.2%)	78(20.4%)	0.002

## Results - cont

### Detection Ratio

- 52% (273) of the screened patients had at least one risk factor.
- 18% of patients at risk were screen positive, compared to only 2.8% patients with no risk factors.
- By screening targeted population with one of the risk factors we would discover 88% of positive patients (49 out of 56).

## conclusions

- A 10.6% prevalence of ESBL carriers among new admissions to the hospital was found.
- Targeted screening for high-risk patients would allow us to screen 52% of the new admissions and identify 88% of ESBL carriers.