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IMPACT OF REMOVING ESBL TESTING REPORT from CULTURE on THE SELECTION OF ANTIBIOTICS for THE TREATMENT AND 30-DAY MORTALITY of PATIENTS INFECTED with ESBL-PRODUCING ORGANISMS

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INTRODUCTION

- Carbapenem use is a risk factor for the development of infections with carbapenem-resistant gram-negative organisms.
- Minimizing the use of carbapenem is a main goal of antimicrobial stewardships in hospitals around the world.
- In 2010, the CLSI revised routine ESBLs testing was no longer necessary, treatment decisions can be made solely on MICs.
- Recent studies described the impact of removal of the ESBL designation from electronic medical record reports was associated with reduction in carbapenems use for definitive treatment for ESBL-E infections.

AIMS

- We aimed to characterized the impact of removal of the ESBL designation from microbiology reports on inpatient antibiotic prescribing and mortality.

METHODS

- A historical control and interventional analysis study at a 1300-bed university hospital in Bangkok, Thailand.
- We compared inpatient antibiotic prescribing and mortality for 1 year before (period 1; August 1, 2019 to July 31, 2020) and 1 year after removal of ESBL designation (period 2; August 1, 2020 to July 31, 2021) in the Hospital Information System (HIS).
- We conducted a washout period for 1 month (August 1, 2020 to August 31, 2020).

RESULTS

- 2,314 patients were ESBL detected during the study period.
- A total of 213 and 207 patients were selected after simple randomization to the two periods, before and after elimination of the ESBL reports in the HIS.

Table 1. Patient and Microbiology Laboratory Characteristics

	Before report eliminated (n=154)	After report eliminated (n=143)
Sex, male (%)	67 (43)	66 (46)
Age, median y (IQR)	67 (56-81)	67 (52-78)
Immunocompromised (%)	66 (42.9)	74 (51.7)
Specimen (%)		
- Blood	33 (21.4)	35 (24.5)
- Urine	89 (57.8)	89 (62.2)
- Respiratory	32 (20.8)	19 (13.3)
- Blood + urine	14 (9)	13 (9)
- Blood + respiratory	1 (0.6)	2 (1.4)
Microbiology (%)		
- *Escherichia coli*	113 (73.4)	110 (76.9)
- *Klebsiella pneumoniae*	19 (18.8)	25 (17.5)
- *Enterobacter cloacae*	6 (39)	1 (0.7)
- *Salmonella spp.*	2 (1.3)	2 (1.4)
- *Proteus mirabilis*	2 (1.3)	3 (2.1)
- *Citrobacter spp.*	1 (0.6)	0 (0)
- *Morganella morganii*	1 (0.6)	0 (0)
- *Klebsiella aerogenes*	0 (0)	1 (0.7)
- *Phytobacter spp.*	0 (0)	1 (0.7)
ID consult obtained, no.(%)	62 (40)	59 (41)

Definitive ATB prescribed

- Carbapenems use decreased from 56.5% to 41.3%.
- Cefepime use decreased from 13.6% to 3.5% .
- Piperacillin-tazobactam use increased from 10.4% to 28.7%.

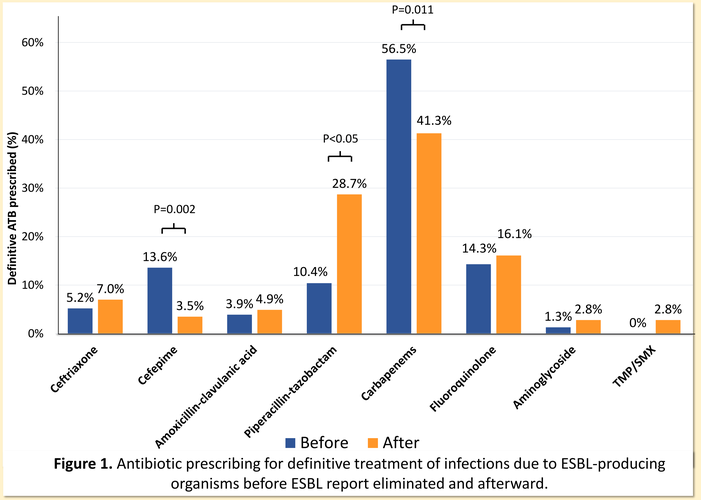

Figure 1. Antibiotic prescribing for definitive treatment of infections due to ESBL-producing organisms before ESBL report eliminated and afterward.

30-day mortality

- 30-day mortality from any cause was not different with 22 of 154 patients (14.3%) in period 1, and 24 of 143 (16.8%) in period 2 (P = 0.55).

Subgroup analysis

- Non-statistically significant decrease in carbapenem used for definitive treatment of bacteremia 84.4% in period 1 vs 68.6% in period 2, P = 0.155.
- Carbapenem used for UTI decreased from 49.4% to 28.1% (P = 0.005),while piperacillin-tazobactam used was more (11.2% versus 32.6%, P = 0.001).
- We did not observe decreased use of carbapenem for pneumonia, both as empirical and definitive therapy.

Table 2. 30 days mortality from any cause in subgroup analysis

Definitive ATB prescribing	Before report eliminated (n=22)	After report eliminated (n=24)	P value
- Ceftriaxone (%)	2 (9.1)	1 (4.1)	0.559
- Cefepime (%)	3 (13.63)	1 (4.1)	0.75
- Amoxicillin-clavulanic acid (%)	0 (0)	0 (0)	N
- Piperacillin-tazobactam (%)	2 (9.1)	5 (20)	0.975
- Carbapenems (%)	14 (63)	14 (58)	0.287
- Fluoroquinolone (%)	1 (4.5)	2 (83)	0.596
- Aminoglycoside (%)	0 (0)	0 (0)	N
- TMP-SMX (%)	0 (0)	1 (4.1)	N

N = no statistic are computed because no subjective

CONCLUSIONS

✓ Definitive prescribing of carbapenems and cefepime were decreased. Piperacillin-tazobactam was increased after removal of the ESBL report.

✓ Our findings confirm the importance of collaboration between microbiology and antimicrobial stewardship programs.

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