

NEQAS 2016 tulemuste arutelu

M. Ivanova

E. Makoid

kõik laborid

Üldinfo

- Osalesid kõik EARS-Net laborid (11) ja Synlab, proovid on ECDC poolt tasuta
- Synlab toetas proovide kohaletoimetamist
- EARS-Net laboritele edastatud sertifikaadid eduka sooritamise kohta
- Synlabile edastatud kontrolltüved ning saadud tulemused kasutatakse kontrollina probleemsete tulemuste analüüsis (BMD meetodil saadud tulemused)
- Väga kaua aega läheb NEQAS-il tulemuste analüüsimiseks ja avaldamiseks

3676 *E.coli*

- This specimen contained an *Escherichia coli* with an acquired AmpC β -lactamase enzyme (BIL-1) conferring resistance to all reference β -lactam agents except imipenem and meropenem
- An excellent concordance of results was seen for all antimicrobial agents except ertapenem and piperacillin-tazobactam

3676 *E.coli*

Ertapenem		
Resistant		
Result	Count	Percentage
Susceptible	5	50,0
Intermediate	1	10,0
Resistant	4	40,0
Not examined	1	
Total (S,I,R)	10	100

Eeldatav tulemus Resistentne

	Result by guideline			
	S	I	R	% concordance
score				
BSAC	4	4	2	20.0
EUCAST	399	47	146	24.7
CLSI	69	5	15	16.9
SFM	23	4	11	28.9
All	495	60	174	23.9
EE	5	1	4	40.0

3676 E.coli

Table 1. Susceptibility of *E. coli* 3676 to ertapenem reported by participants using different guidelines and methods.

Guideline	Method	Number (%) participants reporting		
		S	I	R
EUCAST/EUCAST-related	Automated	239 (83.9)	4 (1.4)	42 (14.7)
	Disk diffusion	101 (49.0)	29 (14.1)	76 (36.9)
	MIC	83 (59.3)	21 (15.0)	36 (25.7)
	Multi/Other	2 (28.6)	1 (14.3)	4 (57.1)
	Total	425 (66.6)	55 (8.6)	158 (24.8)

Phoenix - Sensitive

3676 *E.coli*

Piperacillin-Tazobactam		
Resistant		
Result	Count	Percentage
Susceptible	6	60,0
Intermediate	1	10,0
Resistant	3	30,0
Not examined	1	
Total (S,I,R)	10	100

Eeldatav tulemus Resistentne

	Result by guideline			
	S	I	R	% concordance
score				
BSAC	5	1	9	60.0
EUCAST	223	157	319	45.6
CLSI	35	37	32	30.8
SFM	6	13	17	47.2
All	269	208	377	44.1
EE	6	1	3	30.0

3676 *E.coli*

Table 2. Susceptibility of *E. coli* 3676 to piperacillin-tazobactam reported by participants using different guidelines and methods.

Guideline	Method	Number (%) participants reporting		
		S	I	R
EUCAST/EUCAST-related	Automated	85 (25.3)	99 (29.5)	152 (45.2)
	Disk diffusion	117 (39.7)	49 (16.6)	129 (43.7)
	MIC	28 (27.2)	18 (17.5)	57 (55.3)
	Multi/Other	4 (30.8)	4 (30.8)	5 (38.4)
	Total	234 (31.3)	170 (22.8)	343 (45.9)

Phoenix - Sensistive

EUCAST warning TZP

- Piperacillin tazobactam gradientribad BM ja LF ei anna usaldusväärset tulemust ning annavad süstemaatilisi vigu
- Diskdifusiooni tulemused on usaldusväärsed (30+6 mkg disk) rahuldava sisemise QC tulemuste korral

Võimalikud lahendused

- BMD? Ei tundu samuti usaldusväärne (PHOENIX? VITEK?)
- Liofilchemi uus toode SensiTest™ TZP ei ole veel turule jõudnud, kui ilmub - tasub proovida
- Mitte vastata S tulemused tüvedel ESBL-A, ESBL-M ja ESBL-CARBA mehhanismidega?

3677 *Klebsiella pneumoniae*

- This specimen contained a strain of *Klebsiella pneumoniae* with both OXA-1 and SHV-1 enzymes, expressing resistance to many beta-lactam agents, including inhibitor combinations, colistin (by EUCAST methods) and quinolones. The isolate was susceptible to imipenem, meropenem, ceftriaxone and ceftazidime.
- Cefotaxime was categorised as intermediate/resistant based on an MIC of 2-4 mg/L. The isolate expressed resistance to both gentamicin and tobramycin and intermediate susceptibility to amikacin.
- The organism expressed intermediate resistance to amikacin (MIC 16 mg/L) by EUCAST breakpoints. The 787 participants reporting amikacin susceptibility reported variable results (11.9% susceptible, 33.8% intermediate and 54.3% resistant).
- Ühes laboris on samastatud kui *Klebsiella oxytoca*

3677 *Klebsiella pneumoniae*

Amikacin		
Intermediate EUCAST/ Susceptible CLSI		
Result	Count	Percentage
Susceptible	0	0,0
Intermediate	2	20,0
Resistant	8	80,0
Not examined	1	

Eeldatav tulemus - Intermediate

	Result by guideline			% concordance
	S	I	R	
score				
BSAC	6	1	1	87.5
DIN	0	0	1	0.0
EUCAST	41	231	369	42.4
CLSI	37	21	40	59.2
SFM	10	13	16	59.0
All	94	266	427	45.7
EE	0	2	8	20.0

3677 *Klebsiella pneumoniae*

Table 3. Susceptibility of *K. pneumoniae* 3677 to amikacin reported by participants using different guidelines and methods.

Guideline	Method	Number (%) participants reporting		
		S	I	R
EUCAST/EUCAST-related	Automated	7 (2.4)	103 (35.7)	179 (61.9)
	Disk diffusion	39 (13.5)	104 (36.1)	145 (50.4)
	MIC	9 (8.9)	32 (31.7)	60 (59.4)
	Multi/Other	2 (20.0)	5 (50.0)	3 (30.0)
	Total	57 (8.3)	244 (35.5)	387 (56.2)

Phoenix - Intermediate

3677 *Klebsiella pneumoniae*

	Result by guideline			% concordance
	S	I	R	
<hr/>				
score				
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BSAC	1	0	5	83.3
EUCAST	40	2	455	91.5
CLSI	3	0	59	95.2
SFM	2	0	16	88.9
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All	46	2	535	91.8
EE	0	0	5	100.0

Colistin – eeldatav tulemus
Resistant MIC 32

MIK Eesti laborites

Phoenix – Sensitive, tulemuste korratavus on halb

EUCAST warning

- **Colistin gradient tests** can be obtained from [bioMérieux](#) and from [Liofilchem](#). The EUCAST Development Laboratory has evaluated the two available gradient tests. Results were similar for both gradient tests on Mueller-Hinton agar from two manufacturers. Etests were also tested on MH-E (the MH produced by and recommended by bioMérieux). Both gradient tests underestimated MIC values by one or more twofold dilutions, especially for concentrations on or above the breakpoint of 2 mg/L, **leading to false susceptible results (VME)**. Results on Etest were marginally better when the test was performed on the MH recommended by the manufacturer but VMEs were still a significant problem, and even more so with *Pseudomonas* and *Acinetobacter*.
- Both manufacturers have been informed and are working on improving their products. It is not known whether or not this issue can be resolved by recalibrating the gradient tests or whether it is related to the same difficulties as those seen with disk diffusion. **The currently available gradient tests should until further notice be withdrawn from use in the laboratory!**

EUCAST warning

- **Internal quality control.** To detect the problems we have described it is not enough to use the recommended QC strains for *E. coli* (ATCC 25922) and *P. aeruginosa* (ATCC 27853). Most failures occurred where broth microdilution MICs were 2, 4 and 8 mg/L and the MICs of the QC strains are lower. The EDL is currently developing a suitable QC strain in the MIC range 4 - 8 mg/L.

EUCAST warning

- For colistin broth microdilution, colistin frozen panels from TREK Diagnostics (Thermo Fisher Scientific) were compared with standard freeze-dried panels (Sensititre, Thermo Fisher Scientific™) and two different Micronaut panels from Merlin™. All tested colistin broth microdilution panels worked well and only few errors occurred with any of the panels

EUCAST poster P 161

- Evaluation of five commercial MIC methods for colistin antimicrobial susceptibility testing for Gram-negative bacteria
- Conclusions: the commercial BMD methods reliably determined colistin MICs. **The correlation between gradient tests and reference MICs was poor, even when QC results were within range.** This was probably related to the poor diffusion of colistin in agar. Based on the results of this study, EUCAST recommends laboratories to use BMD methods for colistin MIC determination and advice against the use of gradient tests at this point.

SensiTest™ Colistin



P. aeruginosa 3678

- This specimen contained a strain of *Pseudomonas aeruginosa* resistant to ciprofloxacin, gentamicin, tobramycin, carbapenems, and piperacillin-tazobactam
- The carbapenem resistance in this isolate is likely to be mediated by porin loss/efflux as **no known carbapenemase** enzyme is present
- A good concordance of results was obtained for all agents except ceftazidime
- The ceftazidime MIC (8 mg/L) was **susceptible by both EUCAST and CLSI breakpoints**. The 891 participants reported variable results (31.4% susceptible, 7.2% intermediate and **61.4% resistant**)
- Eesti laborites on saavutatud **100% Resistant** tulemused
- **PHOENIX – Sensitive!**
- **Järeldused.... Ettepanekud...**

P. aeruginosa 3678

Table 5. Susceptibility of *P. aeruginosa* 3678 to ceftazidime reported by participants using different guidelines and methods.

Guideline	Method	Number (%) participants reporting		
		S	I	R
EUCAST/EUCAST-related	Automated	79 (21.6)	8 (2.2)	278 (76.2)
	Disk diffusion	86 (31.0)	1 (0.4)	190 (68.6)
	MIC	57 (44.2)	3 (2.3)	69 (53.5)
	Multi/Other	7 (53.8)	1 (7.7)	5 (38.5)
	Total	229 (29.2)	13 (1.7)	542 (69.1)

3679 *S. aureus*

- mecC MRSA
- Ühes laboris ei tuvastatud cefoxitin-oxacillin resistentsust

Järeldused

- Süsteemsed probleemid:
 - Piperacillin-tazobactam laiendatud toimespektriga beeta-laktamaase produtseerivatel tüvedel
 - Ceftazidim ja *P. aeruginosa*?
- Üksikud juhuslikud probleemid erinevates laborites
- Colistini määramise reaalne pilt ebaselge, vajab täpsustamist
- EARS-Net (NEQAS) võimaldab hinnata diagnostilisi probleeme laiemalt (mitte ainult ühe labori vaatevinklist)