27th ECCMID Vienna, Austria 22 – 25 April 2017

The congress of ESCMID

Session: P018 Detection of resistant pathogens

Category: 4a. Diagnostic bacteriology – culture based

22 April 2017, 15:30 - 16:30
P0379

Evaluation of a new commercial medium, the chromagar msupercarba, for the detection of carbapenemase-producing Enterobacteriaceae

Maayan Amar[1], Ohad Shalom*[2], Amos Adler[1]

[1]*Tel-Aviv Sourasky Medical Center*

[2]*Tel-Aviv Sourasky Medical Center; Laboratory of Clinical Microbiology*

Background: In Israel, the carbapenemase-producing Enterobacteriaceae (CPE) epidemic was initially caused by KPC-producing K. pneumoniae. in recent years, new types of CPE, including NDM- and OXA-48-producing Enterobacteriaceae, have disseminated in Israel. Thus, surveillance media such as the CHROMAgar™-KPC (KPC) or MacConkey with Imipenem (1 mg/L) (MAC/IMI) that are widely used in Israel might be inadequate to cope with these new challenges. The objective of this study was to evaluate the performance of a new commercial media, the CHROMAgar™ mSuperCARBA™ (SUPERCARBA), for the detection of variety of CPE strains.

Material/methods: The study examined the in-vitro performance for the detection of CPE of three media: 1) KPC; 2) MAC/IMI; 3) SUPERCARBA. The study used a collection of 98 carbapenem-resistant Enterobacteriaceae (CRE) strains, that included 69 CPE's of various genes (table) and 29 non-carbapenemase-producing (NCP) CRE's. Growth of all isolates was tested at a 101 to 103 cfu inoculum. The sensitivity was calculated as 1) the growth of CPE's at the 101 inoculum; 2) sensitivity score (growth at 101,102 and 103 credited 2, 1 and 0.5 points, respectively); 3) sensitivity adjusted to the actual prevalence of each of the CPE types at our hospital (Tel-Aviv Sourasky Medical Center). The specificity was calculated based on the growth of NCP-CRE. In addition, the 3 media were tested with a set of non-CRE organisms, including ESBL- and AmpC-producing Enterobacteriaceae, carbapenem-resistant non-fermentor gram-negative bacteria, gram-positive bacteria and Candida spp.

Results: The sensitivity and specificity of the three media in detecting CPE's vs. NCP-CRE are presented in the table. The SUPERCARBA was the most sensitive media by all parameters, especially in detecting OXA-48 CPE. The MAC/IMI media was the second most sensitive by the non-adjusted

measures but scored below the KPC media by the prevalence-adjusted measure. The MAC/IMI media was slightly more specific compared with the SUPERCARBA media. All three media were able to efficiently differentiate CRE from non-CRE organisms.

Conclusions: The CHROMAgarTM mSuperCARBATM media is superior to commonly used surveillance media in detecting non-KPC CPE's that are becoming more prevalent in Israel.

	Total		Detection at ~10^1 cfu			Detection score		
	Isolates (n)	Score (max.)	MAC/IMI	SUPERCARBA	KPC	MAC/IMI	SUPERCARBA	KPC
KPC	11	22	8	9	9	16	19	19
NDM	17	34	13	12	11	28.5	26.5	24.5
OXA-48	19	38	5	14	6	15	32	13
VIM	15	30	14	14	10	28	28.5	21
IMI	5	10	5	3	4	10	6	9
CPE, total	67	134	45	52	40	97.5	112	86.5
Sensitivity (%)			67	78	60	73	83	64
95% C.I.			55-77	66-86	48-70	65-80	76-89	56-72
Adjusted sensitivity			62	78	66	66	84	70
NCP-CRE	29	58	14	15	18	32	32.5	37
Specificity			52	48	38	45	44	36