Poster Session: Diagnostics: Bacteriology/Mycobacteriology

(P-2085) Optimizing GAIHN-AR Network Microbiology Laboratory Assets for Early Detection of Carbapenemase-Producing Organisms in Limited Resources Settings: Argentine Experience

Saturday, October 19, 2024 2:15 PM – 3:30 PM CDT Location: Halls JK

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Background: The Global Action in Healthcare Network-Antimicrobial Resistance Module (GAIHN-AR), led by the U.S. CDC, enhances prevention, detection and response in low-resource hospital settings (LRS) against emerging antimicrobial resistance (AR) threats, with an initial focus on carbapenemase-producing organisms. GAIHN-AR includes a lab. component for improving early AR detection, an infection prevention and control program, and a communication platform for rapid response coordination. We describe the implementation verification/validation of new AR diagnostic methods and their integration into clinical workflowTable

Method	No. of isolates and species	CBP allelic variants	No. of allelic variants	SN (%)	SP (%)	PR (%)	ACCEPTABLE
Verification							
GENEXPERT®- Xpert Carba-R							
• Cepheid swab	27: 12 K. pneumoniae, 5 PAE, 5 E. coli, 2 ABA, 2 Enterobacter spp y 1 M. morganii	OXA (48, 163, 181, 232), IMP (1, 4, 26), KPC (2, 3, 4), VIM (1, 2, 4, 27), NDM (1)	4 OXA, 3 IMP, 3 KPC, 4 VIM, 1 NDM	100	100	100	YES
• Dacron swab				100	100	100	YES
• Direct colony				100	100	100	YES
NG-Test® CARBA-5	27: 13 K. pneumoniae, 6 PAE, 4 E. coli, 2 E. aerogenes, 1 E. cloacae y 1 M. morgannii	OXA (48, 163, 181, 232), IMP (1, 4, 26), KPC (2, 3, 4), NDM (1, 5) VIM (1, 2, 4, 27)	4 OXA, 3 IMP, 3 KPC, 4 VIM, 2 NDM	100	100	100	YES
CHROMagar mSuperCARBA®	25: 10 K.pneumoniae, 5 PAE, 5 E.coli, 2 ABA, 2 Enterobacterspp. y 1 M.morganii.	OXA (23, 24, 48, 163, 181, 232), IMP (1, 4, 26), KPC (2, 3), VIM (1, 2, 4), NDM (1)	6 OXA, 3 IMP, 2 KPC, 4 VIM, 1 NDM	100	100	100	YES
RAPIDEC® CARBA NP	23: 9 K. pneumoniae, 5 PAE, 4 E. coli, 2 ABA, 1 E. aerogenes, 1 E. cloacae, 1 M. morgannii	OXA (23, 24, 48, **181**, 232), IMP (1, 4, 26), KPC (2, 3, 4), NDM (1) VIM (1, 2, 4, 27)	5 OXA, 3 IMP, 3 KPC, 4 VIM, 1 NDM	95	100	96	YES
GENEXPERT®- Xpert Carba-R Validation							
KPC variants	17: 16 K. pneumoniae, 1 K. aerogenes	KPC (14, 25, 31, 33, 44, 57, 73, 80, 81, 96, 97, 160, 161, 162, 163, 164, 165, 168,	19 KPC	100	100	100	YES
IMP variants	12: 6 K. pneumoniae, 1 K. oxytoca, 4 PAE, 1 Acinetobacter spp.	IMP (1, 4, **8, 13, 16, 18**, 26)	7 IMP	**44**	100	**85**	**NO**

CBP: carbapenemase. SN: sensitivity. SP: specificity. PR: precision. False negative results or performace <95% are higlighted

Methods:

Prior to GAIHN-AR initiation in two hospitals in Argentina in January 2023, validation of CPO diagnostic techniques was conducted. For this, reference strains characterized by WGS from the CDC & FDA AR-Bank and Argentina-NRL repository were used. Evaluation followed manufacturer specifications, with GeneXpert also tested with alternative Dacron swabs. Pure colonies were used for validation of all methods, except for GENEXPERT®Carba-R where contrived fecal sample were also used. Methodologies were acceptable with sensitivity, specificity, and precision values ≥ 95%.The following methodologies were verified for carbapenemase detection in *Enterobacterales*, *P. aeruginosa*, and *Acinetobacter* spp. (ACI): (i) GENEXPERT®Carba-R; (ii) NG-Test®CARBA-5 lateral flow (ACI excluded); (iii) CHROMagar mSuperCARBA® chromogenic medium for carbapenem resistance detection; (iv) RAPIDEC® CARBA-NP. Additionally, the GENEXPERT®Carba-R was validated for: i) KPC variants with ceftazidime/avibactam resistance, ii) local circulation metallo-β-lactamase IMP variants

Results: The methodologies under evaluation achieved performance between 95-100%, except for the IMP variants with GenXpert Carba-R where sensitivity was reduced to 44% (Table).

Conclusion:

Verification/validation process demonstrated that most methods had acceptable performance, allowing integration into lab workflows to facilitate prompt diagnosis and rapid communication with IPC teams. Results benefited not only GAIHN-AR hospitals but also other LRS facilities with whom they were shared through the NRL, offering valuable lessons for similar settings

Disclosure(s):

Alejandra Corso, Microbiologist: No financial relationships to disclose

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Paulina Marchetti, n/a: No financial relationships to disclose

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