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ePoster Viewing
Resistance mechanisms

Evaluation of the performance of OXA-48 K-SeT immunochromatographic test for rapid identification of OXA-48 carbapenemase-producing Enterobacteriaceae

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Background: Carbapenemase-producing *Enterobacteriaceae* pose great diagnostic challenges to microbiology laboratories. The phenotypic tests lack the required sensitivity and specificity and the molecular methods are costly and time-consuming. Among carbapenemases, OXA-48 is particularly problematic since there is currently no specific inhibitor to identify its activity in phenotypic tests. In this study we evaluated the performance of newly developed immunochromatographic test "OXA-48 K-SeT" to rapidly detect OXA-48-like carbapenemases from bacterial colonies.

Material/methods: A well-characterised collection of carbapenemase positive and negative clinical *Escherichia coli* and *Klebsiella pneumoniae* isolates together with reference strains was used to evaluate the performance of OXA-48 K-SeT (Coris BioConcept, Belgium) lateral flow assay. For this purpose, a total of 232 isolates harboring one or two carbapenemase gene(s) were studied in this study; OXA-48 (n=194), OXA-48+NDM-1 (n=13), OXA-48+VIM (n=1), NDM-1 (n=16), KPC (n=3), IMP (n=3), VIM (n=2). In addition, 30 isolates which lack any carbapenemase activity (negative in CARBA NP test, negative in multiplex polymerase chain reaction test designed for OXA-48, IMP, VIM, NDM-1 and KPC genes) were included to assess the specificity of the test. Bacterial colonies grown on Columbia agar + 5% sheep blood plates (bioMerieux, France) were used to perform the test as per manufacturer's instructions.

Results: The test showed excellent sensitivity (100%) and specificity (100%) for the study collection (Table 1). The performance of the test was found not to be affected by the presence of OXA-48 together with another carbapenemase gene (NDM, n=13; VIM, n=1), also none of the other carbapenemase-gene harboring isolates gave a positive result. The test provided easy-to-read results in 10 minutes with less than 15 minutes total hands-on time.

Conclusions: The OXA-48 K-SeT immunochromatographic test was recently developed for the detection of OXA-48 carbapenemases from colonies grown on solid media which allows rapid and easy detection of an important resistance mechanism. The test was found to provide excellent sensitive and specific results within minutes that may help to proper manage the treatment and initiate necessary infection control measures. In Turkey OXA-48 is the most prevalent carbapenemase gene in *Enterobacteriaceae*, followed by NDM-1 and the new kit exhibited superb performance for these carbapenemases (no false positivity, no false negativity). This new test might be useful for institutions with limited molecular microbiology services to rapidly detect OXA-48-producing isolates.

Table 1. The performance of OXA-48 K-SeT on challenge strains (n=262)

		OXA-48 K-Set (n)	
Carbapenemase gene	**n**	**Positive**	**Negative**
OXA-48	194	194	0
OXA-48 + NDM-1	13	13	0
OXA-48 + VIM	1	1	0
NDM-1	16	0	16
KPC	3	0	3
IMP	3	0	3
VIM	2	0	2
Negative	30	0	30