OLB24
2-hour Oral Session
Late breaker session: Other

Multicentre evaluation of the FilmArray meningitis/encephalitis panel

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Background:

Recently, the FilmArray meningitis/encephalitis (ME) panel was launched on the FilmArray® platform (Biofire, Salt Lake City, US), an assay for the simultaneous detection of 14 pathogens.

The aim of this multicentre study was to verify the limit of detection (LOD) and the accuracy of all included pathogens as described in the package insert. To guarantee equal results, an inter-laboratory-evaluation was organised.

Material/methods:

All experiments were carried out according to the manufacturer's instructions, using the ME panel v1.4 and protocol CSF v3.0.
The LOD experiments were performed by analysing each pathogen at a concentration of 2- 3 times the LOD. Bacterial NCTC/ATCC strains were cultured, diluted and quantified by colony counting of culture media. Because of the lack of availability of well-defined strains for *Escherichia coli K1* and *Cryptococcus neoformans/gattii*, LOD experiments were not performed for these pathogens. For viruses, dilutions of QCMD samples with known concentration were analysed. Each dilution was analysed once. In case of a negative result the sample was re-analysed in duplicate. If the LOD could not be confirmed, a dilution with a higher concentration was made and analysed in the same way as described.

For the accuracy experiment, 17 clinical samples with none of the suspected pathogens present were analysed. A total of 42 samples suspicious for ME were also analysed. The clinical presentation was combined with other laboratory test results. Discordant results were confirmed with an in-house real-time PCR as referee.

The inter-laboratory evaluation was performed by analysing a physiologic salt solution and a 1:5 dilution of a pool of NATtrol™ ME Controls (Zeptometrix, Buffalo, US) on all sites at 3 different time points, to assess transport and storage conditions.

Results:

The LOD could be confirmed for all pathogens, except for some strains of *H. influenzae*. Figure 1 gives an overview of the LOD as claimed by the manufacturer, compared to our findings.

In 2 of the 17 suspected negative samples, a viral pathogen (Enterovirus and Human herpes virus 6 (HHV6)) was found. The Enterovirus result could not be confirmed by 2 in-house PCRs, nor by GeneXpert (Cepheid).
Out of 42 positive samples, 4 samples reported as false negative. In 3 of the QCMD samples, a positive result for HHV6 was obtained which could not be confirmed by an in-house PCR.

All sites reproduced the same results in the inter-laboratory evaluation, indicating that samples can be kept at room temperature and at 2-8°C for at least 1 and 7 days respectively.

Conclusions:

The FilmArray ME panel seems a promising and useful assay in the diagnosis of central nervous infections. LOD's as claimed by the manufacturer were confirmed except for some strains of *H. influenzae.* Discordant results obtained in the accuracy experiment need further investigation.

Pathogen	Sample (concentration/ml)	LOD (concentration/ml)	Result Filmarray
Haemophilus influenzae	NTC 8468 (1600 CFU)	1000 CFU	Negative (3x)
	NTC 8468 (2800 CFU)		Negative (3x)
	NTC 8468 (3800 CFU)		Negative (3x)
	NTC 8468 (4100 CFU)		Positive (1x)
	NTC 8468 (8000 CFU)		Positive (1x)
	ATCC 10211 (2410 CFU)		Positive (1x)
Listeria monocytogenes	ATCC 13932 (1560 CFU)	1000 CFU	Positive (1x)
Neisseria meningitidis	ATCC 13090 (1200 CFU)	100 CFU	Positive (1x)
	ATCC 1309 (480 CFU)		Positive (1x)
Streptococcus agalactiae	ATCC 12386 (1120 CFU)	1000 CFU	Negative (3x)
	ATCC 12386 (2300 CFU)		Negative (2x) and positive (1x)
	ATCC 12386 (3500 CFU)		Positive (1x)
	ATCC 12386 (5600 CFU)		Positive (1x)
Streptococcus pneumoniae	ATCC 49619 (400 CFU)	100 CFU	Positive (1x)
Cytomegalovirus	QCMD2014-07 (8318 copies)	4300 copies	Positive (also positive for HHV6, not confirmed with in-house PCR)
Enterovirus Coxsackie A9	QCMD2013-03 (10 $TCID_{50}$)	5 $TCID_{50}$	Positive (1x)
Enterovirus type A16	QCMD2013-07(10 $TCID_{50}$)	A16: not mentioned, A17: 5 $TCID_{50}$	Positive (1x)
Herpes simplex virus 1	QCMD2014-01 (5408 copies)	1510 copies	Positive (1x)
Herpes simplex virus 2	QCMD2014-08 (5023 copies)	1290 copies	Positive (1x)
Human herpes virus 6	QCMD 2015 C2-04 (11000 copies)	10000 copies	Positive (1x)
Parechovirus	QCMD EV2010-04 (2240 $TCID_{50}$)	500 $TCID_{50}$	Positive (1x)
Varicella zoster virus	QCMD2014-09 (4140 copies)	1660 copies	Positive (1x)