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Abstract (eposter session)

Evaluation of matrix-assisted laser desorption/ionisation-time of flight mass spectrometry (MALDI-TOF MS) performed directly on intravascular catheters

M. Guembe*, B. Rodríguez-Sánchez, A. Ruíz, P. Martín-Rabadán, M. Rodríguez-Créixems, C. Sánchez, E. Bouza Santiago (Madrid, ES)

Routine microbiological analysis of catheter tip cultures requires at least 48 hours for a final microorganisms' identification. The use of the matrix-assisted laser desorption/ionization time of flight (MALDI-TOF) mass spectrometry has proven effective and fast in some clinical samples for the identification of colonizing microorganisms. Objectives: To analyze the validity values for the prediction of colonization and catheter-related bloodstream infection (C-RBSI) of the MALDI-TOF mass spectrometry performed at all intravascular catheters that arrived at microbiology laboratory. Methods: During 3 months, catheter tips (after performing the roll-plate technique) were introduced in 5 mL of brain-heart infusion broth and incubated at 37ºC under continuous agitation during 24 hours. The tubes were centrifuged at 3500 rpm for 5 min and discarded the supernatant. The pellet was incubated with TWEEN-80 0.5% for 10 min and spotted onto a MALDI-TOF target place covered with 1µL of formic acid 100% and with 1µL of matrix. The gold standard for colonization and C-RBSI were, respectively: the presence of >or= 15 cfu/plate in the catheter tip culture; and the isolation the same microorganism(s) both in blood cultures and in the colonized catheter (during the 7 days before or after catheter withdrawal). Results: We collected a total of 182 intravascular catheters. The overall colonization rate detected by roll-plate technique and MAL-TOF mass spectrometry was 31.9% and 32.4%, respectively. The majority (98.4%) of colonized catheters detected by MALDI-TOF mass spectrometry were associated with high scores (>or= 1.5). Overall, there were 33 (18.1%) episodes of C-RBSI. The distribution of microorganisms is detailed in table 1. The validity values of the MALDI-TOF mass spectrometry for the identification of colonization and C-RBSI were, respectively: sensitivity (69.0%/66.7%), specificity (84.7%/75.2%), positive predictive value (65.6%/36.1%), and negative predictive value (86.8%/92.6%). The median (SD) time for the final microorganisms' identification was significantly low using MALDI-TOF mass spectrometry than using roll-plate technique: 1.73 (1.16) vs. 3.60 (2.17) days ($p<0.001$), respectively. Conclusion: MALDI-TOF mass spectrometry could be an alternative diagnostic tool for ruling out C-RBSI. However, despite it demonstrated to be faster than conventional culture, future researches are needed to improve the pre-analytical process.

Microorganisms	Roll-plate N (%)	Maldi-Toff N (%)	Blood cultures N (%)
Gram +	**53 (73.6)**	**46 (75.4)**	**44 (68.8)**
S. epidermidis	31 (43.1)	27 (44.3)	28 (43.8)
CNS	9 (12.5)	10 (16.4)	6 (9.4)
E. faecalis	8 (11.1)	7 (11.5)	6 (9.4)
S. aureus	5 (6.9)	2 (3.3)	4 (6.3)
E. faecium	-	-	1 (1.6)
Corynebacterium spp.	-	-	1 (1.6)
B. cereus	-	1 (1.6)	-
Gram -	**11 (15.3)**	**10 (10.6)**	**13 (20.3)**
P. aeruginosa	3 (4.2)	2 (3.3)	3 (4.7)
M. morganii	1 (1.4)	1 (1.6)	1 (1.6)
A. xylosoxidans	1 (1.4)	1 (1.6)	1 (1.6)
S. maltophilia	1 (1.4)	2 (3.3)	2 (3.1)
K. oxytoca	1 (1.4)	1 (1.6)	-
E. aerogenes	-	1 (1.6)	1 (1.6)
E. cloacae	1 (1.4)	-	2 (3.1)
E. coli	-	-	1 (1.6)
P. mirabilis	-	1 (1.6)	-
E. asburiae	1 (1.4)	-	-
A. baumannii	1 (1.4)	-	1 (1.6)
A. genomospecies	-	1 (1.6)	-
K. pneumoniae	1 (1.4)		
Yeasts	**8 (11.1)**	**5 (8.2)**	**7 (10.9)**
C. albicans	4 (5.6)	2 (3.3)	1 (1.6)
C. parapsilosis	2 (2.8)	2 (3.3)	4 (6.3)
C. tropicalis	2 (2.8)	1 (1.6)	2 (3.1)
Total	**72**	**61**	**64**

CNS, coagulase-negative Staphylococci.