

Can catheter slicing be replaced by sonication for the diagnosis of neonatal intravascular catheters' colonization?

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A recent study of our group demonstrated that slicing longitudinally before culture silicone neonatal peripherally inserted central catheters (SN-PICCs) showed better results than the roll-plate technique (Maki) to detect catheter colonization (Martín-Rabadán et al. ECCMID 2014, O189). However, this laboratory procedure can take a risk for healthcare workers. Then, finding a safer and easier alternative procedure to process the SN-PICCs is required.

**Objectives.** To assess the improvement of sonication for the detection of colonization and catheter-related bloodstream infection (C-RBSI) in SN-PICCs in comparison to the roll-plate technique.

**Methods.** During 6 months we prospectively performed in the Microbiology laboratory catheter tip cultures of SN-PICCs withdrawn from pediatric patients admitted to our institution. We first performed catheter tip culture by the roll-plate technique (Maki) in blood agar plates and then we sonicated it (1 min + vortex) in 1 ml of BHI. We cultured 100 µl of the sonicate into blood agar plates. The gold standard for catheter colonization was the presence of ≥15 cfu/plate in Maki and/or ≥100 cfu/catheter segment in sonication. C-RBSI was defined as the isolation of the same microorganism(s) both in the catheter tip and in blood cultures obtained 7 days before of after catheter withdrawal.

**Results.** We included a total of 90 SN-PICCs, and the prevalence of colonization and C-RBSI was 28.9% (26/90) and 22.2% (20/90), respectively. The rate of colonized catheters detected only by the roll-plate, sonication, and both were, respectively: 2/26 (7.7%), 9/26 (34.6%), and 15/26 (57.7%). When we compared the validity values of each technique to predict CC and C-RBSI, we found that sonication was significantly better than roll-plate (p<0.001) (table).

**Conclusion.** We suggest that SN-PICCs should be performed in the Microbiology laboratory combining the roll-plate technique with the sonication method.

	sensitivity% CI (95%)	specificity% CI (95%)	positive predictive value% CI (95%)	negative predictive value% CI (95%)	validity index CI (95%)	prevalence% CI (95%)	Likelihood ratio + CI (95%)	Likelihood ratio - CI (95%)
<b>Catheter colonization</b>								
roll-plate	65.4 (45.2-85.6)	100 (99.2-100)	100 (97.0-100)	87.7 (79.4-95.9)	90.0 (83.2-96.7)	28.9 (18.9-38.8)	NA	0.35 (0.20-0.59)
sonication	92.3 (80.1-100)	100 (99.2-100)	100 (97.0-100)	96.9 (92.0-100)	97.8 (94.2-100)	28.9 (18.9-38.8)	NA	0.08 (0.02-0.29)
<b>C-RBSI</b>								
roll-plate	70.0 (47.4-92.6)	95.7 (90.3-100)	82.3 (61.3-100)	91.8 (84.8-98.8)	90.0 (83.2-96.7)	22.2 (13.0-31.4)	16.33 (5.20-51.26)	0.31 (0.16-0.61)
sonication	90.0 (74.3-100)	91.4 (84.2-98.7)	75.0 (55.6-94.4)	96.9 (92.0-100)	91.1 (84.7-97.5)	22.2 (13.0-31.4)	10.20 (4.82-22.82)	0.11 (0.03-0.41)