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Paper Poster Session VI

Biofilm: formation, pathogenesis, diagnosis

Is sonication of needleless connectors useful to predict central venous catheter colonization?

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Semiquantitative cultures of skin surrounding intravascular catheter entrance and the catheters hubs ("superficial cultures") demonstrated to have a high negative predictive value to assess catheter tip colonization (CC) without catheter withdrawal [Cercenado et al. Arc Inter Med 1990]. However, culturing the inner side of the hubs (hub cultures) requires catheter manipulation that could be a risk for microorganisms migration to the bloodstream. Hubs are nowadays closed by needleless connectors (CONs) that could be purportedly predictors of catheter colonization.

Objectives. To evaluate the yield of culture of sonicates of CONs for the prediction of CC in comparison to hub cultures.

Methods. During 6 months we prospectively collected all central lines and systems (SYS) removed from patients admitted to the cardiac surgery postoperative care unit irrespective of the reason of withdrawal. Hub cultures were obtained immediately before catheter withdrawal and cultured by the semiquantitative method (positive: ≥15 cfu/plate). Catheter tip culture was performed by the roll-plate technique and sonication (positive culture: ≥15 cfu/plate and/or ≥100 cfu/catheter segment, respectively) and whole CONs were cultured by semiquanitative culture after sonication (≥20 cfu/CON). We defined colonization of the CON when ≥1 cultures of all CONs were positive.

Results. We collected a total of 73 SYS. The CC rate was 8.2% (6/73). The hub and CON colonization rates were, respectively: 6.8% (5/73) and 9.6% (7/73). The validity values of hub and CON to predict CC were, respectively: sensitivity, 33.3%/83.3%, especificity, 95.5%/97.0%, positive predicitive value, 40.0%/71.4%, negative predicitve value, 94.1%/98.5%, and validity index, 90.4%/95.9%. In the table we detailed the microorganisms recovered in the CC.

Conclusion. Closed needleless connectors can be used as an alternative non-invasive and conservative diagnostic procedure to predict CC. However, futures prospective studies are required using a high sample size and adding skin superficial cultures.

Sample No.	Microorganisms, cfu		
	Catheter tip	Hub	Connector
40	*Staphyloccocus capitis*, 1000 *Staphyloccocus hominis*, 1000	*Staphyloccocus epidermidis*, 50 *Staphyloccocus hominis*, 100	*Staphyloccocus capitis*, 1000 *Staphyloccocus hominis*, 500 *Klebsiella pneumoniae*, 30
67	*Staphyloccocus epidermidis*, >1000	*Staphyloccocus epidermidis,* >1000	*Staphyloccocus epidermidis*, 1500
97	*Rhodotorula mucilaginosa*, >1000	-	-
53	*Staphyloccocus epidermidis*, 1000 *Corynebacterium tuberculoestearicum*, 1000	-	*Staphyloccocus epidermidis*, 600
36	*Staphyloccocus epidermidis*, 100 *Enteroccocus faecalis*, 200 *Klebsiella penumoniae*, 79	-	*Staphyloccocus epidermidis*, 1300
31	*Staphyloccocus epidermidis*, 500	-	*Staphyloccocus epidermidis*, 1000