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P1425 Can dalbavancin be used as a catheter lock solution?

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Background: Dalbavancin is a newly emerging lipoglycopeptide with high activity against Gram positive microorganisms, which due to its pharmacokinetic and pharmacodynamic characteristics, can be administered only necessary as single IV doses every 7-14 days. At present, dalbavancin is only approved for the treatment of soft tissue infection but there are several studies that demonstrate its efficacy also for other infections such as catheter-related bloodstream infection (C-RBSI). When catheter retention is attempted, lock solutions with antimicrobial agents with good biofilm penetration are indicated. Regarding dalbavancin, there are few data in the literature of its potential application as a lock solution in catheters that must be retained and which are colonized by Gram-positive microorganisms. Our objective was to assess the stability and efficacy of dalbavancin alone and in combination with heparin against MRSA and MRSE biofilms, and to compare results with that obtained with Vancomycin alone and in combination with heparin.

Materials/methods: We used a 96-well plate in vitro model of 24h-biofilms of MRSA ATCC 43300, MRSE ATCC 35984, and two clinical strains of MRSA and MRSE. Biofilms were exposed to dalbavancin (0.128 mg/ml) and vancomycin (5 mg/ml) alone and in combination with 60 IU heparin. Median percentage reduction of metabolic activity, biomass, bacterial load, and cell viability of each solution were assessed and compared. In order to test viability of heparin and dalbavancin together as a potential antibiotic lock solution to be used in a clinical setting for 7 days, heparin and dalbavancin stability assays were also performed during this time.

Results: Dalbavancin combined with heparin reduced significantly the median (IQR) percentage of metabolic activity in MRSA strains compared to vancomycin: 90.0% (70.4%-92.9%) vs. 35.0% (14.8%-59.6%), p=0.006. For the rest of the variables tested, it showed no inferiority with respect to vancomycin both in MRSA and MRSE strains (**table**). Moreover, we demonstrated that heparin and dalbavancin kept its effectiveness and stability in an antimicrobial lock solution during 7 days.

Conclusions: Dalbavancin demonstrated to be active against biofilms of MRSA and MRSE and its potential use as catheter lock solution combined with heparin seems to be a promising approach.

Table. Comparison between the different antibiotic lock solutions against biofilms of MRSA and MRSE

Microorganism	Treatment						
	Median (IQR) % reduction	DAL[a]	VAN[b]	P value	DAL+HEP[a]	VAN+HEP[b]	P value
MRSA	XTT	88.9 (84.7-92.2)	39.3 (3.6-56.5)	<0.001	90.0 (70.4-92.9)	35.0 (14.8-59.6)	0.006
	CV	42.3 (21.7-50.1)	0.0 (0.0-21.7)	0.019	38.1 (13.2-47.7)	0.0 (0.0-42.3)	0.113
	Log_{10} cfu	19.5 (19.4-)	16.5 (15.9-)	0.200	19.3 (19.2-)	23.1 (23.1-23.1)	0.667
	Viable cells	61.1 (28.9-78.1)	25.2 (16.3-53.1)	0.179	45.9 (34.2-57.5)	62.8 (35.7-)	0.517
MRSE	XTT	93.2 (90.8-96.4)	68.4 (62.4-86.4)	0.009	88.8 (74.6-97.0)	91.0 (79.0-92.0)	1.000
	CV	47.3 (0.0-81.3)	26.2 (0.0-40.9)	0.485	35.2 (0.0-87.9)	39.8 (2.1-69.3)	0.937
	Log_{10} cfu	56.1 (41.1-68.0)	25.2 (18.6-)	0.286	34.0 (19.4-)	26.7 (19.2-)	0.667
	Viable cells	85.7 (84.6-)	68.9 (59.3-81.2)	0.095	76.6 (67.4-84.6)	77.8 (67.5-88.8)	0.937

Values in bold represent statistical significance.
[a] We did not found statistical significant differences between dalbavancin and dalbavancin+heparin regaring any of the variables.
[b] We did not found statistical significant differences between vancomycin and vancomycin+heparin regaring any of the variables.
MRSA; methicillin-resistant *Staphylococcus aureus*; **MRSE**, methicillin-resistant *Staphylococcus epidermidis*; **IQR**, interquartile range; **DAL**, dalbavancin; **VAN**, vancomycin; **HEP**, heparin; **XTT**; tetrazolium salt; **CV**, cristal violet; **cfu**, colony forming units.