EV0310

ePoster Viewing

Basic Science: animal models including experimental treatment

The efficacy of dalbavancin in treatment of rat sternal MRSA osteomyelitis

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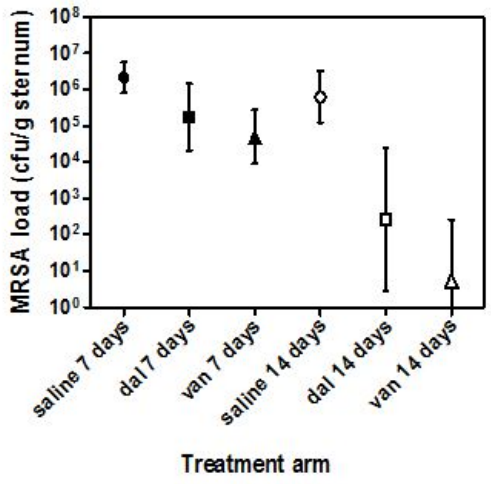
OBJECTIVES: Dalbavancin, a semi-synthetic lipoglycopeptide antibiotic, has been approved by the US FDA for the treatment of adults acute bacterial skin and skin structure infections. . It is characterized by a long plasma half-life which allows for weekly dosing. Thus, dalbavancin may be a good treatment option for patients with deep sternal wound infections due to its improved pharmacokinetic profile and antibacterial activity compared to currently used antibiotics.

We aimed to evaluate the efficacy of dalbavancin in reducing MRSA sternal load in a rat deep sternal wound infection model.

METHODS: A mid-sternal wound was surgically induced in anesthetized rats (n=84). A clinical strain of MRSA was injected (0.05 mL of $1X10^7$ cfu/rat) into the sternum to establish infection following immediate closure. Rats were treated for 7-or 14-days with either dalbavancin (dal), IP 20 mg/kg loading dose followed by 10 mg/kg daily), or vancomycin (van, IP, 50 mg/kg, q12h), or saline, (IP once daily). Quantitative MRSA load in sternum and spleen (for evaluation of systemic infection) were determined (cfu/g tissue), using viable counts following serial dilutions and plating on blood agar plates. The antibacterial efficacy of each antibiotic was determined by the reduction in bacterial counts/gram sternum in each treatment group.

RESULTS: MRSA load (Geometrical mean MRSA cfu/gram of bone with 95% CI) in the sternum of rats of each treatment was analyzed and compared (Figure)



*p values: **Dal 7 vs Saline 7 = 0.001**

Dal 14 vs Saline 14 = 0.006

Dal 7 vs Van 7 = 0.35

Dal 14 vs Van 14 = 0.53

Systemic dissemination: proportion of infected rats with systemic MRSA dissemination after 7 days of treatment were 33%, and 5% for the vancomycin and dalbavancin-treated groups, respectively. P values were 0.025 between saline and dalbavancin or vancomycin-treated groups. Both van and dal-treated groups were similar (p value=1.0).

CONCLUSION: Dalbavancin is effective in the treatment of MRSA rat sternal osteomyelitis. Treatment with dalbavancin was significantly superior to treatment with saline, for 7 days (0.75-log reduction in sternal cfu) or 14 days (>3 log-reduction in sternal cfu), and similar to treatment with vancomycin. Additionally, dalbavancin was also effective in reducing systemic dissemination of MRSA.