Effects of daptomycin treatment on TNF-α-stimulated human endothelial cells.

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Background

Daptomycin is a lipopeptide antibiotic used in the treatment of systemic and life-threatening infections caused by Gram-positive organisms. It has a particular mechanism of action, disrupting multiple aspects of bacterial cell membrane function, which makes it useful in treating infections caused by multiple drug-resistant bacteria.

In addition to its antibacterial properties, there is also some evidence indicating that **daptomycin could also exhibit anti-inflammatory and immunomodulatory properties beneficial in the treatment of infections.**

Using an *in vitro* approach, our study pretends to explore how daptomycin administration modulates human endothelial cell response to TNF-α stimulation, a common cellular model used to study inflammatory conditions.

Methods

■ Statistical analysis was performed with ANOVA followed by *post hoc* test when appropriate using statistical software Prism 5.
■ A p<0.05 was considered statistically significant.

Results

Daptomycin (µg/mL)	Cell death (% necrosis)	IL-6 (pg/mL)	MCP-1 (pg/mL)	E-selectin (pg/mL)
0 (control)	100	258.3 ± 19.2	115.3 ± 8.8	298.7 ± 25.4
15	74.2 ± 2.6*	245.6 ± 37.9	118.5 ± 10.2	280.3 ± 30.8
25	63.1 ± 4.4*	201.5 ± 16.4 *	75.7 ± 5.4*	210.6 ± 10.1*
50	66.5 ± 5.1*	151.7 ± 21.5*	60.8 ± 3.3*	204.5 ± 15.2*
100	65.7 ± 6.3*	148.8 ± 17.1 *	60.5 ± 6.1 *	208.3 ± 18.7*

Cell death: mean percentage of dead cells ± S.D. respect to control, considering control as 100% death
IL-6, MCP-1, E-selectin: mean ± S.D. *p<0.05 respect to control group
IL: interleukin-6, MCP-1: chemokine monocyte chemoattractant protein 1 .

Conclusions

- ➡ Daptomycin has shown protective effects against human endothelial cell death induced by TNF-α, which might be related to an attenuation of inflammatory, chemotactic and cell adhesion mechanisms.
- ➡ Future studies might explore the potential role of daptomycin in modulating molecular mechanisms involved in inflammatory processes, expanding its beneficial role besides its known antimicrobial effect.