Efficacy and safety of sustained release of vancomycin through fibrin glue against local prosthesis infection by methicillin-resistant staphylococcus aureus.

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Abstract:

Purpose: Artificial device infection especially with methicillin-resistant Staphylococcus aureus (MRSA) often becomes critical in cardiovascular surgery. Topical antibiotic administration has been applied empirically; however, no comprehensive data exist showing long-lasting effects and safety of local antibiotic usage. We assessed fibrin glue (FG) as a slow-release vehicle for vancomycin (VCM) against local MRSA infection by means of animal experiments. Methods: Preliminary in vitro experiments were performed to confirm that the FG-VCM mixture maintained viscosity as a sealant and exhibited slowrelease of VCM. We next created a subcutaneous pocket in rodent back and implanted a 1cm 2 woven graft with 1ml of FG alone, or with serial concentrations of vancomycin (0-120 mg/ml. n= 3 for each group). MRSA of 1*107 colony-forming units (CFU) was injected into the pocket after wound closure. The graft was explanted 7 days later and was submitted for culture ('Culture-graft'); blood samples were obtained for regular blood work, serum VCM concentration measurements and blood culture ('Culture-blood'). The pocket tissue was also submitted to measurement of local VCM concentration. Results: There was a remarkable infectious response in the group without vancomycin; however, no other groups developed any sign of infection. 'Culturegraft' showed MRSA growth only with V0. 'Culture-blood' was negative in all groups, and only minimal serum concentrations of vancomycin were detected. Conclusion: One-dose topical

administration of VCM via FG was effective against localized MRSA graft infection without systemic

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VCM administration. Topical administration of antibiotics may help treat difficult graft infections and reduce systemic use of potent antibiotics.
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