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

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