Are There Synergistic Effects for Intrawound Vancomycin and High Perioperative Inspiratory Oxygen?

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Purpose: Separate effects for intrawound vancomycin in reducing deep surgical site infection (SSI) and high perioperative inspiratory oxygen to reduce superficial SSI in patients undergoing surgery for high-risk fractures of the lower leg have been recently demonstrated by randomized trials. The existence of a synergistic effect when these 2 therapies are used together is unknown. The objective was to examine the synergistic effect of intrawound vancomycin powder and supplemental perioperative oxygen in reducing deep SSIs among patients with tibial plateau and pilon fractures.

Methods: This was a secondary analysis of data from a randomized trial of intrawound vancomycin, which also collected inspiratory oxygen data. Propensity scored weighting was used to estimate the effect of high vs low inspiratory oxygen when combined with (randomized) receipt of intrawound vancomycin. As in the main study, the primary outcome was deep SSI within 182 days of definitive fracture fixation. Secondary outcomes included: overall, gram-positive, gram-negative-only, and superficial SSI.

Results: As shown in the table, there were no significant differences between the group randomized to vancomycin who received high oxygen, when compared to the group randomized to vancomycin who received low oxygen, for any of the of the 5 outcomes studied.

Conclusion: No synergistic effect of reducing SSI was observed with intrawound vancomycin powder and supplemental perioperative oxygen.

	Group 1: Randomized Vancomycin-Observed High Oxygen	Group 2: Randomized Vancomycin-Observed Low Oxygen
All SSI	0.10 [0.07,0.14]	0.10 [0.04,0.16]
All deep SSI	0.07 [0.04,0.10]	0.06 [0.01,0.10]
All superficial SSI	0.04 [0.02,0.07]	0.04 [-0.01,0.09]
Gram-positive deep SSI	0.04 [0.01,0.06]	0.02 [0.00,0.05]
Gram-negative-only deep SSI	0.03 [0.02,0.03]	0.02 [0.02,0.02]