

Research Article

The Effectiveness of Bedside Low Pressure Irrigation on Pistol Caliber Gun Shot Wounds Bacterial Contamination

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INTRODUCTION

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METHODS

Twenty lamb shanks were shot with a nine- millimeter pistol at a distance of three meters. To replicate a clinical setting, denim fabric was placed in front of the impact zone. The denim fabric was treated with a standardized number of targeted bacteria (*Serratia marcescens*) for post incubation colony identification. This bacterium was chosen for its easily identifiable color on growth media. Two control samples were fired upon without bacterial inoculation. Specimens were cultured immediately after impact and post irrigation with both 250cc and 500cc total normal saline. Irrigation was performed with a 60cc syringe at a rate of 20cc per second. The syringe tip was placed just outside of the entrance wound to allow back flow. Cultures for all specimens were examined after 72 hours by a microbiologist and rated on quantity of growth

RESULTS

Of the 20 specimens that underwent firing and culture procedures, 19 provided viable data for analysis. Before irrigation, 0 (0%) plates showed no growth, 2 (10.5%) showed rare growth, 8 (42.1%) showed few growth, 6 (31.6%)

showed moderate growth, and 3 (15.8%) showed many growth. After 500cc irrigation, the numbers in each category remained similar, with 2 (10.5%), 1 (5.3%), 11 (57.9%), 2 (10.5%), and 3 (15.8%) plates falling within their respective categories. A Fisher exact test confirmed that there was not a statistically significant difference in the proportion of plates within each category across all time points ($p=0.59$). In addition to maintaining similar proportions in each growth category across all irrigation time points, the levels of growth across each specimen showed high variability. There was no clear pattern for change in bacterial growth levels after 250cc or 500cc irrigation, with 5/19 specimens showing a sustained decrease in growth, 7/19 showing no change at either t point, 4/19 showing a transient increase in bacterial growth after 250cc irrigation that returned to baseline levels after the second 250cc irrigation, 1/19 that showed transient decrease in bacterial growth after 250cc irrigation that increased to baseline levels after the second irrigation, and 2/19 that showed sustained increases in bacterial growth. There was no significant correlation between number of irrigations and level of bacterial growth when controlling for specimen ($\rho = -0.15$, $p = 0.25$).

CONCLUSION

Our data demonstrates no statistically significant decrease in bacterial quantity with the stated method of low-pressure irrigation for the management of pistol caliber gunshot wounds and brings into question the use of such method in the clinical setting.

a [Conflicts of Interest Statement for Dr. Colen](#)
[Visit the Open Payments Data Page for Dr. Colen](#)

b [Conflicts of Interest Statement for Dr. Lindeman](#)

c [Conflicts of Interest Statement for Dr. Ablove](#)
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