

Integrating hypochlorous acid into a wound hygiene protocol: creating a new standard of care

Dr. Laura Swoboda DNP, APNP, FNP-BC, FNP-C, CWOCN-AP

Background: Wound care is a significant source of antibiotic prescriptions and thus an important field for implementation of antimicrobial stewardship. Research has found 16.4% of total antibiotic prescriptions can be attributed to wounds. In 2016, 270.2 million antibiotic prescriptions were written in the US, enough for 5 out of 6 adults to receive antibiotic coverage. Biofilm, known inhibitor of wound healing, normally creates a protective casing to wound microbes that shields them from antimicrobials and antibiotics. After disrupting biofilm a therapeutic window exists where antimicrobials, such as hypochlorous acid (HOCl), are more effective.

Purpose: To determine whether incorporating hypochlorous acid as a standard of care within a wound hygiene protocol of care decreases the number of patients receiving antibiotics, and the number of days of antibiotic therapy.

Methods: At an academic health system's community hospital division in the Midwest a Wound Hygiene Protocol was implemented incorporating hypochlorous acid (Puracyn Plus, Innovacyn, Rialto CA) treatment as a standard of care for all wound types and patient presentations to proactively treat common barriers to wound healing including limiting the re-formation of biofilm and addressing pro-inflammatory bioburden. Topical and systemic antibiotic prescriptions including total antibiotic days prescribed per month per provider, as well as the form and type of antibiotics prescribed were reviewed for a one month time period. Patients seen for ostomy issues, those with chronic long term antibiotic coverage managed by infectious disease, and antibiotic courses started prior to establishing in the wound clinic were not included. Comparisons between providers that incorporated hypochlorous acid as a standard of care and intermittent usage were analyzed.

Results: A total of 219 patients were treated at the wound centers under review, 213 of which met inclusion criteria. Of the three wound specialists under review Group 1 (n=54) utilized HOCl as a standard of care within a wound hygiene protocol. Groups 2 (n=74) and 3 (n=85) utilized HOCl intermittently.

Of patients in group 1 utilizing HOCl as part of wound hygiene protocol: 0% received topical antibiotic therapy; 5% of patients received oral, IM, or IV antibiotic therapy.

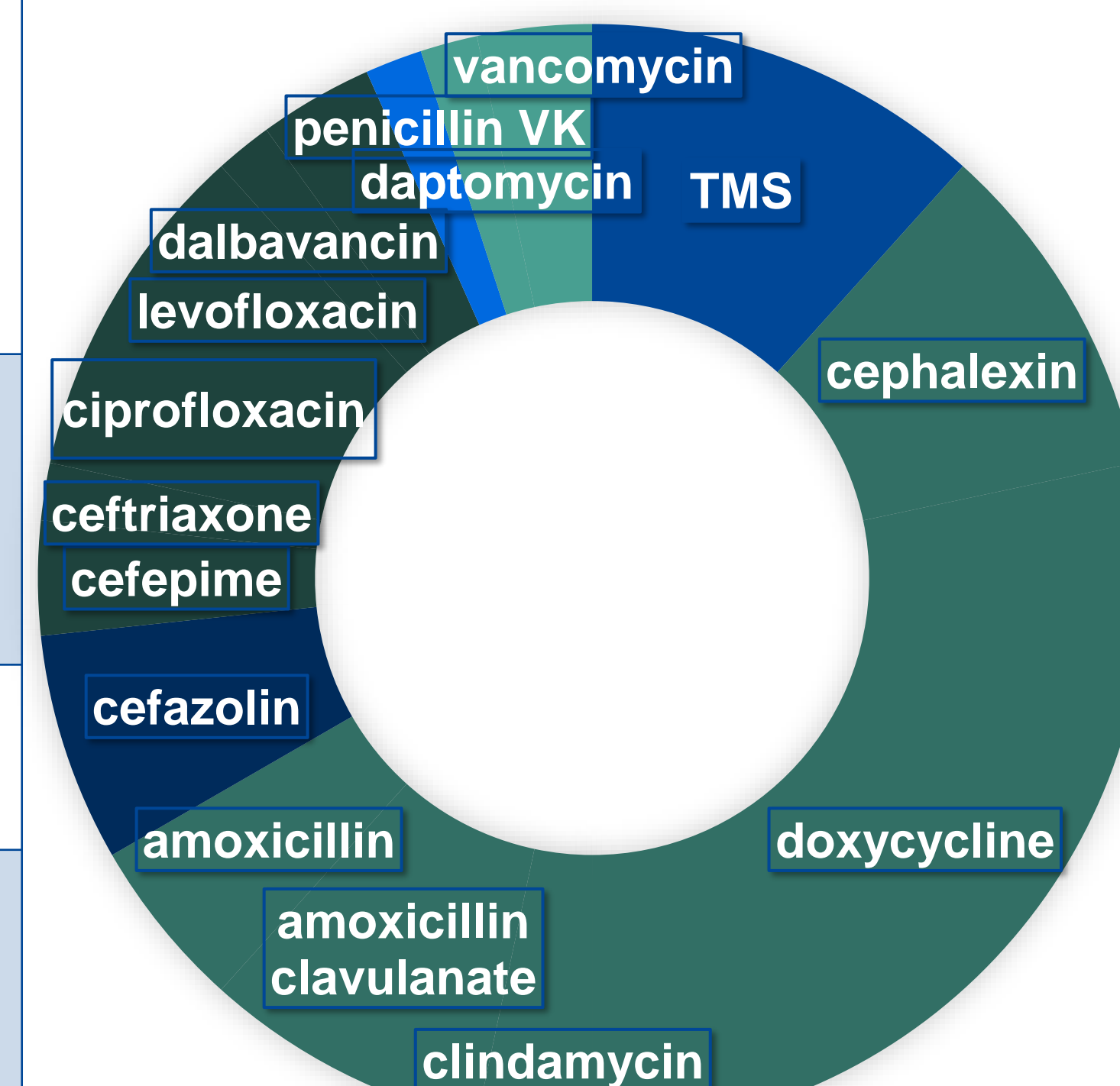
Of patients in group 2: 16% of patients received topical antibiotic therapy; 42% received oral, IM, or IV antibiotic therapy. Of patients in group 3: 20% of patients received topical antibiotic therapy; 33% received oral, IM, or IV therapy. The most common topical antibiotics utilized were mupirocin 2% ointment and gentamicin 0.1% ointment. The most common oral antibiotic utilized was doxycycline. The most common IV antibiotic prescribed was cefazolin



Patient with calcific arteriopathy of the posterior calf
 (A) Prior to presentation in the wound center
 (B) Following 2 weeks of wound hygiene including HOCl
 (C) Following 1 month of wound hygiene including HOCl
 (D) Epithelialization at 16 weeks

	Number of patients receiving topical ATB	Number of patients receiving oral, IM, or IV ATB	Total number of topical ATB days	Total number of oral, IM, or IV ATB days	Percentage of patients receiving topical ATB	Percentage of patients receiving oral, IM, or IV ATB
1. Wound hygiene & hypochlorous acid as standard of care (n=54)	0	9	0	60	0%	5%
2. Routine management (n=74)	12	31	153	166	16%	42%
3. Routine management (n=85)	17	28	383	205	20%	33%

ATB: antibiotic; IM: intramuscular; IV: intravenous; HOCl: hypochlorous acid; TMS: trimethoprim sulfamethoxazole



Antibiotic Usage: Oral, IM, IV

Conclusion/Discussion: Hypochlorous acid is an ideal agent to incorporate into a wound hygiene protocol for decontamination of the wound and periwound following cleansing. It has favorable effects on fibroblast and keratinocyte migration compared to other antimicrobial cleansers making it preferable to limit bioburden while avoiding cytotoxicity. Wound hygiene is a protocol of care that incorporates evidenced-based wound bed preparation and biofilm based wound management to routinely, regularly, and proactively address common barriers to healing. Wound hygiene protocols that incorporate hypochlorous acid support antimicrobial stewardship without compromising healing, and have potential to limit antibiotic usage in complex patients with palliative and hard-to-heal wounds.

References
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