



Impact of Doxycycline Prophylaxis on Skin and Soft Tissue Infections in Navy SEAL Trainees

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Background

- The military has a 21% higher incidence of Skin and Soft Tissue Infections (SSTI) than similarly-aged non-military populations, with a disproportionate burden of those SSTI occurring in recruit and training settings
- U.S. Naval Special Warfare (NSW) trainees are frequently exposed to prolonged periods of intense physical exertion and extreme environments placing them at high risk for SSTI
- Several severe cases of SSTIs caused by salt-water associated Gram-negative pathogens (mainly *Shewanella algae*) prompted introduction of doxycycline prophylaxis during the highest risk portion of training, "Hell Week" starting in 2015



FIGURE 1. Necrotizing fasciitis caused by *Vibrio harveyi* in an NSW trainee during "Hell Week" prior to introduction of doxycycline prophylaxis

Methods

- Retrospective cohort study assessing affects of doxycycline prophylaxis on all NSW trainees who participated in the "Hell Week" phase of training from April 2013 to February 2020
- Examined hospital admission data and local medical clinic data for all trainees and compared data prior to Doxycycline prophylaxis (pre-Aug 2015) to data after (post-Aug 2015)

Results

Primary Outcome:

- Hospital admissions rates for SSTI before and after intervention

Secondary Outcomes:

- Overall incidence of SSTI
- Percentage of diagnosed SSTI that required hospital admission
- Average length of hospital stays
- Incidence of infections with salt-water associated Gram negative rods (*Shewanella aglae*, *Vibrio spp.*)

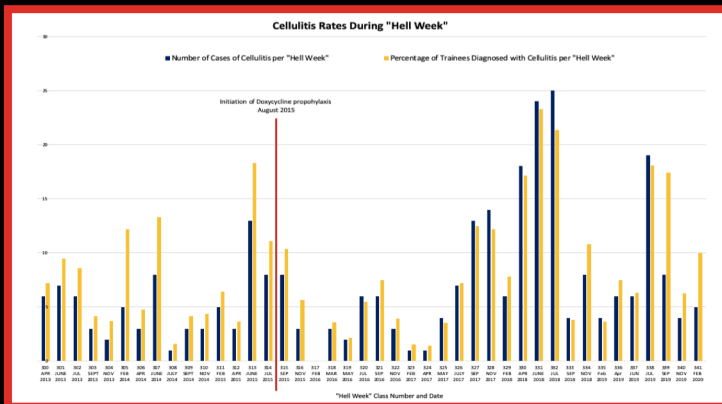


FIGURE 2. Total number of SSTI diagnosed at NSWCM medical clinic each "Hell Week" training period with corresponding percentage of NSW trainees diagnosed with SSTI in each class.

Outcome	Pre-Doxycycline prophylaxis	Post-Doxycycline prophylaxis	Rate ratio	P-value
Hospital Admission rate (per 100 trainees)	1.37 (14/1024)	0.64 (15/2347)	0.468 (95% CI: 0.226 – 0.968)	p = 0.036
Overall SSTI incidence rate	7.42% (76/1024)	8.86% (208/2347)	1.19 (95% CI: 0.918 – 1.55)	p = 0.185
Hospital Admission rate per diagnosed SSTI	18.4% (14/76)	7.2% (15/208)	0.392 (95% CI: 0.189 – 0.811)	p = 0.0089
Hospital Admission length (average mean days)	9.07 (n=14)	4.33 (n=15)	---	p = 0.034

TABLE 1. Primary and secondary outcome data with associated rate ratios (when applicable) and p-values.

	Wound Cx (pre-Doxy)	Blood Cx (pre-Doxy)	Wound Cx (post-Doxy)	Blood Cx (post-Doxy)
<i>Staph aureus</i>	6	1	5	1
GAS	4	---	4	---
<i>Shewanella algae</i>	3	1	---	1
<i>Vibrio harveyi</i>	1	1	---	---
Coag (-) <i>Staph</i>	2	---	1	1
<i>Staph lugdunensis</i>	1	---	---	---
<i>Diphtheroids</i>	1	---	2	---
<i>Enterococcus faecalis</i>	2	---	---	1
<i>Acinetobacter haemolyticus</i>	2	---	---	---
<i>Pseudomonas aeruginosa</i>	1	---	---	---
<i>Providencia rettgeri</i>	---	---	1	---

TABLE 2. Wound and blood culture (Cx) data from the pre-intervention and post-intervention cohorts

Conclusion

Doxycycline prophylaxis during "Hell Week" training was associated with:

- Decreased overall admission rates for SSTI
- No significant change in overall SSTI incidence
- Fewer admissions per diagnosed SSTI
- Shorter hospital stays
- Lower incidence of infection with salt-water associated invasive Gram (-) rods

In special populations whose circumstances require prolonged saltwater exposure and high-risk activities for minor skin trauma, doxycycline prophylaxis at the time of highest risk appears safe and effective

References

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