IMPACT OF OXYCIDE™ USE ON ENVIRONMENTAL CONTAMINATION AND INFECTION RATES COMPARED TO STANDARD CLEANING PRACTICE

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Abstract

Background:
The aims of this study were to compare the standard cleaning practice to cleaning using OxyCide™, a novel, sporicidal, one-step disinfectant concentrate on environmental contamination and hospital-acquired infections (HAIs).

Methods:
A cross-over study was conducted using 1 medical-surgical and 1 intensive care unit. In the intervention group, OxyCide™ was used for routine cleaning of all patient rooms. In the control group, standard cleaning was conducted using Virex II 256-quaternary ammonium compound and Dispatch for *C. difficile* rooms; and Virex II alone for other rooms. The study period was 13 months. Using moist cotton swabs, qualitative environmental cultures were collected after terminal cleaning from selected rooms of discharged patients with *A. baumannii* or *C. difficile*; and quantitative samples were collected from occupied rooms. Standard laboratory procedures were used. HAIs were tracked throughout the study period.

Results:
A total of 4,105 patients were cared for on study units during the study period, accounting for 20,932 patient days. After terminal cleaning, 747 samples were collected from 69 rooms (27 *C. difficile* and 42 *A. baumannii*). There was no growth from 331 swabs collected in the control group and 2/416 swabs (0.5%) from the intervention group grew (1/270 for A. *baumannii* and1/146 for *C. difficile*). 216 swabs were collected from high touch objects in 36 occupied patient rooms (18 in each group). 18/108 (17%) samples from the control group grew, as did 20/108 (18.5%) from the intervention group (p=0.85).
There were a total of 122 unit-acquired infections, 24 device-related infections, 15 unique patients with *A. baumannii* and 25 with *C. difficile*. The rate of HAI was 6.6 in the control arm and 4.8/1000 patient days in the intervention arm (p=0.09); of device-related infection was 1.6 and 0.6/1000 patient days, respectively (p=0.04); of *A. baumannii* was 0.7 and 0.7/1000 patient days respectively (p=0.98); and of *C. difficile*, was 1.0 and 1.4/1000 patient days, respectively (p=0.36).

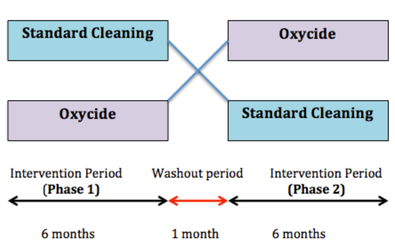
Conclusion:
Use of OxyCide was associated with decreased device-related hospital infections when compared to standard cleaning with quaternary ammonium compound +/- bleach. Recovery of environmental pathogens was low in both study arms.

Background

The aims of this study were to compare standard cleaning practice to cleaning using OxyCide™, a novel, sporicidal, one-step disinfectant Concentrate, on environmental contamination and hospital-acquired infections (HAIs).

Methods

- **A cross-over study was conducted using 1 medical-surgical and 1 intensive care unit.**
- **In the intervention group, OxyCide™ was used for routine cleaning of all patient rooms. In the control group, standard cleaning was conducted using Virex II 256-quaternary ammonium compound and Dispatch for *C. difficile* rooms; and Virex II alone for other rooms. The total study period was 13 months.**
- **Using moist cotton swabs, environmental samples for qualitative analysis were collected after terminal cleaning from selected rooms of discharged patients with *A. baumannii* or *C. difficile*; and environmental samples for quantitative analysis were collected from occupied rooms.**
- **Standard laboratory procedures were used.**
- **HAIs were prospectively tracked throughout the study period, using NHSN definitions**



Results

Qualitative Culture Results for *Clostridium difficile* and *Acinetobacter baumannii* Collected After Terminal Cleaning

	Standard Cleaning: Number of positive swabs / Total Swabs	OxyCide: Number of positive swabs / Total Swabs	p	Standard Cleaning: Number of rooms with one or more positive cultures / Total rooms	OxyCide: Number of rooms with one or more positive cultures /Total rooms	p
Acinetobacter baumanni						
Phase 1	0/53	1/214	1.0	0/7	1/25	1.0
Phase 2	0/98	0/56		0/6	0/4	
Total (Phase 1 + Phase 2)	0/151	1/270	1.0	0/13	1/29	1.0
Clostridium difficile						
Phase 1	0/44	1/81	1.0	0/4	1/10	1.0
Phase 2	0/136	0/65		0/8	0/5	
Total (Phase 1 + Phase 2)	0/180	1/146	0.44	0/12	1/15	1.0

HAI: Hospital acquired Infections, BSI: Blood Stream Infections, CLABSI: Central Line Associated Blood Stream Infections, CRBSI: Catheter Related Blood Stream Infections, VAP: Ventilator Associated Pneumonia, SSI: Surgical site Infection, UTI: Urinary Tract Infection, CAUTI: catheter Associated Urinary Tract Infection.

Quantitative Culture Results of Swabs Collected from Patients Rooms

	Standard Cleaning: Number of positive swabs / Total Swabs (percent)	OxyCide: Number of positive swabs / Total Swabs (percent)	p	Standard Cleaning: Number of rooms with one or more positive cultures / Total Swabs (percent)	OxyCide: Number of rooms with one or more positive cultures / Total Swabs (percent)	p
Phase 1	9/72 (10.2)	10/72 (13.8)	1	6/12 (50.0)	6/12 (50.0)	1.0
Phase 2	9/36 (25.0)	10/36 (27.7)	1	6/6 (100)	4/6 (66.6)	0.45
Total (Phase 1 + Phase 2)	18/108 (16.6)	20/108 (18.5)	0.85	12/18 (66.6)	10/18 ((0.55)	0.73

Hospital Acquired Infections (HAIs) on Study Units

	Standard Cleaning (Rate per 1000 patient days)	Oxycide (Rate per 1000 patient days)	IRR (95% CI)	P-Value
Total Patients	2200	1905	4105	
Patient days	11101	9831	20932	
Total HAI	74 (6.67)	48 (2.88)	0.73 (0.51 - 1.05)	0.09
Total BSI	15 (1.35)	2 (0.20)	0.15 (0.03 - 0.66)	0.01
non-CLABSI BSI	4 (0.36)	1 (0.10)	0.28 (0.03 - 2.53)	0.26
CLABSI/CRBSI	11 (0.99)	1 (0.10)	0.10 (0.01 - 0.80)	0.03
Total Wound Infections	3 (0.27)	3 (0.31)	1.13 (0.23 - 5.59)	0.88
Total UTI	42 (3.78)	32 (3.26)	0.86 (0.54 - 1.36)	0.52
CAUTI	7 (0.63)	5 (0.51)	0.81 (0.26 - 2.54)	0.71
UTIs non-CAUTI	35 (3.15)	27 (2.75)	0.87 (0.53 - 1.44)	0.59
Device associated infections	18 (1.62)	6 (0.61)	0.37 (0.15 - 0.95)	0.04
C. difficile	14 (1.26)	11 (1.12)	0.89 (0.40 - 1.95)	0.77
Acinetobacter baumannii	8 (3.63)	7 (3.67)	0.99 (0.36 – 2.72)	0.98

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Conclusion

Use of OxyCide™ was associated with decreased device-related infections when compared to standard cleaning with quaternary ammonium compound +/- bleach. Recovery of environmental pathogens was low in both study arms.