

Reduction in the incidence of hospital-associated CDAD by means of the infection control interventions, not including antimicrobial use restrictions



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Introduction

Exposure to both antimicrobial agents and *C.difficile* itself are important risk factors for the development of CDI. There are 3 ways through which patients may be exposed to *C.difficile* in a hospital setting : (1) contact with a healthcare worker; (2) contact with a contaminated environment; (3) direct contact with a CDI patient. Therefore, a multifaceted approach is required in order to minimize exposure to *C.difficile*.

Methods

The incidence of healthcare-acquired CDI in Wonkwang University Hospital was recorded from Apr1, 2011 through Dec 31, 2011. The incidence in the MICU was 5 times higher than the overall incidence rate (4.70 vs. 0.93 cases /1,000 patient-days). The infection control interventions was implemented to the MICU. Before intervention, the infection control procedure was limited to hand hygiene. The infection control interventions implemented consisted of education, isolation, hand hygiene contact precautions, and environmental disinfection. Strict restriction in the use of antimicrobial agents was not included as an infection control interventions.

Table 1. Demographic and clinical characteristics of patients admitted to the MICU prior to and during intervention

Characteristics	Pre-intervention (N=290)	Intervention (N=277)	P-value
Age, years; mean (SD)	67.5 (14.6)	66.9 (14.4)	0.647
Male (%)	62.8	63.5	0.865
Length of stay in MICU, days; (SD)	14.0 (18.2)	14.5 (17.0)	0.760
APACHE III score; mean (SD)	61.5 (22.8)	61.7 (25.3)	0.948
Nasogastric tube insertion state (%)	190 (65.5)	200 (72.2)	0.103
Monthly number of cases (range)	1.8 (0~5)	0.6 (0~3)	0.021
Antibiotics (defined daily dose)			
Third generation cephalosporins	2.95 ± 5.63	2.63 ± 5.58	0.501
Piperacillin/tazobactam	0.82 ± 2.69	0.69 ± 2.36	0.551
Carbapenems	4.16 ± 6.42	4.49 ± 8.64	0.316
Fluoroquinolones	2.58 ± 5.60	2.28 ± 5.62	0.520
Anti-ulcer drugs (defined daily dose)			
Proton pump inhibitors	6.62 ± 14.08	7.79 ± 18.08	0.387

Table 2. Incidence of *Clostridium difficile* infection prior to and during intervention

Department	Incidence of CDI (Cases/1,000 patient-days)		P-value	OR (95% CI)
	Pre-intervention	Intervention		
Overall hospital	0.93	1.17	0.021	
Non-intervention Depts	1.09	1.47	0.004	
Intervention Dept	4.70	1.53	0.012	0.36 (0.13-0.85)

Discussion

In our study, the incidence of CDI during the intervention period was reduced by approximately 67% in the MICU, despite the fact that the overall incidence of CDI in the hospital increased by 20% (Table 2). These results, in combination with previous studies, suggest that patient isolation, environmental cleaning, and use of personal protective equipment (gloves and gowns) may act synergistically to reduce the incidence of CDI.

Conclusion

A multifaceted approach to minimize *C. difficile* exposure can be effective in reducing the incidence of hospital-acquired CDI under conditions that do not allow for the restriction in the use of antimicrobial agents.