Evaluation of oral vancomycin treatment for hospital-acquired *Clostridioides difficile* infection prophylaxis in a community hospital: A retrospective cohort study

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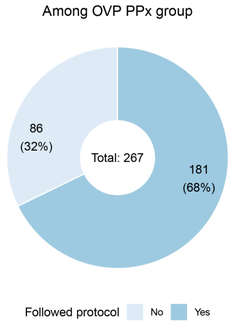
Background

Hospital-acquired (HA) *Clostridioides difficile* infection (CDI) is among the most common hospital-acquired infections and is a leading cause of morbidity and mortality among hospitalized older adults. Oral vancomycin prophylaxis (OVP) has been demonstrated in recent studies to reduce the incidence of HA CDI. This study aims to evaluate the effectiveness of OVP in the prevention of HA CDI in a community hospital setting.

Method

The *C. difficile* prophylaxis protocol was approved by the Local Pharmacy and Therapeutics Committee at Ascension Saint Francis Hospital on **September 2, 2020.**

The electronic medical records were extracted and manually screened between Feburary 2022 to May 2022, from **subjects** admitted to Saint Francis Hospital between **October 1, 2019, through March 31, 2020**, for the control group (**661 subjects**), and subjects who received oral vancomcyin during admission **between October 1, 2020, through March 31, 2021**, for the oral vancomycin prophylactic group (**361 subjects**).



For the control group:
482 were not qualified to serve as control samples due to not meeting the inclusion criteria for oral vancomycin prophylasix based on the *C.diff* prophylasix protocol

For the oral vancomycin treatment group:
26 were diagnosed with *C.diff* infection within 48 hours of admission
8 were excluded due to *C.diff* colonization
60 were excluded due to duplicated records

446 were included in the cohort study, including **179** in the control group, and **267** in the oral vancomycin prophylactic group.

Figure 1. The Study Cohort.

Results

Table 1. Clinical characteristics of the control and intervention groups. *SMD = standardized mean difference

	Observed data (N = 446)			Propensity-score-matched data (N = 330)			Propensity-score-weighted data (N = 445)		
Clinical Characteristics	**Control Group**	**Oral Vancomycin Ppx Group**	**SMD***	**Control**	**Oral Vancomycin Ppx Group**	**SMD**	**Control Group**	**Oral Vancomycin Ppx Group**	**SMD**
	n = 179	n = 267		n = 165	n = 165		n = 179	n = 266	
Age - mean (SD)	65.78 (16.03)	66.14 (14.20)	0.024	66.08 (16.07)	66.64 (13.79)	0.037	65.86 (15.41)	65.94 (14.52)	0.005
Male sex - no. (%)	99 (55.3)	174 (65.2)	0.203	96 (58.2)	100 (60.6)	0.049	112.5 (62.7)	162.9 (61.2)	0.032
Residential type - no. (%)									
Home	97 (54.2)	137 (51.3)	0.058	88 (53.3)	89 (53.9)	0.012	88.2 (49.2)	138.0 (51.8)	0.053
SNF	82 (45.8)	130 (48.7)		77 (46.7)	76 (46.1)		91.2 (50.8)	128.3 (48.2)	
Immunosuppressed - no. (%)	28 (15.6)	33 (12.4)	0.095	25 (15.2)	27 (16.4)	0.033	24.2 (13.5)	36.9 (13.8)	0.01
CKD/ESRD - no. (%)	54 (30.2)	96 (36.0)	0.123	51 (30.9)	55 (33.3)	0.052	60.5 (33.7)	89.0 (33.4)	0.006
History of *C.diff* infection - no. (%)	29 (16.2)	32 (12.0)	0.121	25 (15.2)	22 (13.3)	0.052	24.2 (13.5)	37.0 (13.9)	0.012
Recent hospitalization with antibiotic exposure - no. (%)	93 (52.0)	142 (53.2)	0.025	91 (55.2)	86 (52.1)	0.061	94.7 (52.8)	141.3 (53.1)	0.006
LOS > 7 days with either PPI or H2RA exposure - no. (%)	101 (56.4)	149 (55.8)	0.012	88 (53.3)	95 (57.6)	0.085	98.9 (55.1)	147.7 (55.5)	0.007
Length of stay (days) - median [IQR]	8.00 [5.00, 12.00]	10.00 [5.00, 17.00]	0.373	9.00 [5.00, 12.00]	10.00 [6.00, 14.00]	0.181	9.00 [5.00, 15.00]	9.49 [5.00, 15.00]	0.027
Duration of antibiotics - median [IQR]	7.00 [4.00, 10.00]	9.00 [5.00, 13.00]	0.219	7.00 [4.00, 10.00]	8.00 [5.00, 12.00]	0.092	7.00 [4.00, 10.96]	8.00 [5.00, 12.00]	0.016

Table 2. Effectiveness of oral vancomycin treatment in the prevention of hospital-acquired *C.diff* infection evaluated by the Crude Analysis, Multivariable Analysis, and Propensity-Score Analyses.

Analysis	Hospital-acquired *C.diff* infection	p value
No. of hospital-acquired *C.diff* infection (%)		
Control group	4/179 (2.2)	
Oral vancomycin prophylactic treatment group	12/267 (4.5)	
Crude analysis - odds ratio (95% CI)	2.06 [0.70, 7.46]	0.218
Multivariable analysis - odds ratio (95% CI)	1.71 [0.55, 6.43]	0.383
Propensity-score analysis - odds ratio (95% CI)		
With matching	1.52 [0.43, 6.04]	0.523
With inverse probability weighting	1.73 [0.57, 6.43]	0.359
Adjusted for propensity score	1.39 [0.45, 5.23]	0.59

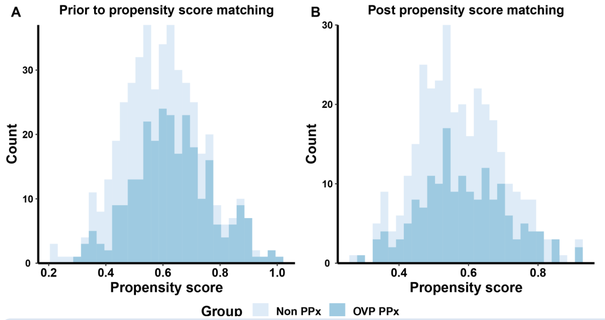


Figure 2. The distribution of propensity score of the control group and oral vancomycin prophylactic group before and after matching.

Summary

Prophylactic administration of oral vancomycin to patients with selected risk factors has no statistical significance in reducing or preventing hospital-acquired *C.diff* infection.