University of Dundee

NHS Tayside

Cohort study of *Clostridium difficile* infection outcomes in Tayside, Scotland, using routine data

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Background

Risk factors for *Clostridium difficile* infection (CDI) are well documented but outcomes following infection have been more problematic to quantify.

Objective

To quantify outcomes after CDI in a well-defined patient cohort using routine data.

Methods

The Infection Control Team provided details of all adults (>15 years old) in the Tayside health board region with laboratory-confirmed CDI from 1st Jan 2011 to 30th June 2013. We used anonymised record linkage to population datasets in the Health Informatics Centre, University of Dundee, to investigate outcomes

We stratified patients by age, gender, Charlson Comorbidity Index (CCI), care home residence and CDI severity (limited to WCC>15/mm^3 and creatinine >1.5x baseline) and compared outcomes using t-tests for length of stay (LOS), and univariate then multivariate (factor included if p≤0.1) binary logistic regression for mortality (30 and 90 day), recurrent CDI (40 and 90 days) and readmission (30 days from discharge after CDI admission).

Results

There were 439 CDI episodes in 331 patients. 214 (65%) patients were female, mean age 71y median age 77y (range 17-97).

Death within 30d occurred after 54 (12%) episodes, and within 90d after 78 (31%). Mortality increased with comorbidity, age, severity and care home residence in adjusted models (Table). Mortality by patients rather than episodes did not alter results. Severity was the only factor associated with recurrence (crude results in Table).

217 (49%) CDI episodes were among inpatients. LOS from CDI date was skewed; mean 30d (SD 57) and median 14d (IQR 6-33). The average cost (£438 per medical OBD) would be median £6,132 (IQR £2,628-£14,454). Care home residents had longer LOS at 56d *v* 27d, t-test p=0.015 (other factors not significant).

There were 47 (22%) readmissions within 30d of the 217 inpatient CDI episodes. Increased age and comorbidity were associated with risk of readmission but not significantly.

			OUTCOME BY CDI EPISODE – odds ratios (p values)							
			30d mortality		90d mortality		40d recurrence		90d recurrence	
		Total N=439	N (%)	Adjust OR (p)	N (%)	Adjust OR (p)	N (%)	Crude OR (p)	N (%)	Crude OR (p)
Gender	**F**	294	34 (12)	-	46 (16)	1.00	46 (16)	1.00	66 (22)	1.00
	M	145	20 (14)	-	32 (22)	1.58 (0.11)	18 (12)	0.76 (0.37)	26 (18)	0.76 (0.28)
Age (years)	**18-64**	119	5 (4)	1.00	5 (4)	1.00	21 (18)	1.00	25 (21)	1.00
	65-80	163	19 (12)	1.97 (0.20)	25 (15)	**2.88 (0.04)**	23 (14)	0.77 (0.42)	34 (21)	0.99 (0.98)
	>80	157	30 (19)	**4.07 (<0.01)**	48 (31)	**7.71 (<0.01)**	20 (13)	0.68 (0.26)	33 (21)	1.00 (0.99)
Charlson index	**0**	171	9 (5)	1.00	16 (9)	1.00	30 (18)	1.00	41 (24)	1.00
	1-2	161	25 (16)	**2.92 (0.01)**	37 (23)	**2.63 (<0.01)**	17 (11)	0.56 (0.07)	26 (16)	0.61 (0.08)
	3+	107	20 (19)	**3.77 (<0.01)**	25 (23)	**2.63 (0.01)**	17 (16)	0.88 (0.72)	25 (23)	0.97 (0.91)
Care home	**No**	381	42 (11)	1.00	57 (15)	1.00	55 (14)	1.00	79 (21)	1.00
	Yes	58	12 (21)	1.67 (0.21)	21 (36)	**2.22 (0.02)**	9 (16)	1.09 (0.83)	13 (22)	1.10 (0.77)
Severe	**No**	318	28 (9)	1.00	46 (15)	1.00	54 (17)	1.00	74 (23)	1.00
	Yes	121	26 (22)	**2.87 (<0.01)**	32 (26)	**2.28 (<0.01)**	10 (8)	**0.44 (0.02)**	18 (15)	0.58 (0.06)

Conclusion

Mortality and CDI recurrence rates were lower than expected but we included community cases, young adults, and non-severe CDI. Next, we are analysing case review data to investigate the effect of factors not available in routine datasets.

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