

**Community Associated *Clostridium difficile* Associated Diarrhoea (CDAD):
A Report of 12 months Enhanced Surveillance
August 2011**

1.0 Introduction

Clostridium difficile is a gram positive, spore forming, toxin producing organism found commonly in children under 2 yrs and also seen in the stools of approximately 3% of adults. In children it is symptomless, even when producing toxin, but in adults it can cause CDAD which ranges from mild symptoms all the way to life-threatening colitis and as such has an appreciable mortality rate especially in the >65's which tends to rise with age.

Whilst much is known about CDAD in the acute/secondary care setting in terms of mode of acquisition, mode of spread and associated risk factors for the development of symptoms, the same cannot be said for community acquired cases. Whilst many cases of CDAD seen in the community may well be attributable to previous hospital admissions, usually in the preceding weeks, there remains a significant cohort who develop the infection with no prior hospital exposure.

In order to reduce the rate and the associated mortality of community associated cases, it is vital that we better understand the risk factors associated with the acquisition and subsequent development of symptoms. A programme of enhanced surveillance by Microbiologist Dr. Rob Townsend, was commissioned by NHS Sheffield.

Cases are defined as those patients with diarrhoea and a positive laboratory test for *Clostridium difficile*, who have had no exposure to secondary care in over 56 days. In order to further elucidate the risk factors associated with these cases an enhanced surveillance proforma (Appendix 1) was established, this was then completed over the telephone by microbiology with the practice managing the patient.

2.0 Methodology and Proforma Questions

Screening commenced in August 2010 to July 2011. The screening questions were: basic patient demographics including; age, sex, postcode, general practice and various patient factors in order to try and identify any modifiable risks such as; co-morbidities, antibiotic exposure, ant-acids - proton pump inhibitors, child care for under 2's and residing in a residential / care home.

Patients were excluded from the screening programme if it was identified that they had exposure to secondary care within 56 days.

3.0 Cases

49 patients were eligible for community screening. Complete data exists for 42 out of the 49 patients. The reasons for those with incomplete or no data collected are; patient notes not available following the patients death (1), GP's unwilling to release the data (3), no reply from GP surgery following written request (3).

It is accepted that in the exclusion of some patients who may have had exposure to secondary care within 56 days, we may have removed some further cases of CDAD,

but this was deemed an appropriate action, in order to more clearly understand purely community associated risk factors.

4.0 Results

Below follows a summary of the key findings from the enhanced surveillance:

4.1 Patient demographics

Age

Age range from 27 to 92 years of age, 9 (22%) of patients were under the age of 65 and 33 (78%) of patients over 65 years of age.

Postcodes

Wide geographic spread across Sheffield, postcodes occurring most frequently (ie>3 cases) are:

S12 (5 cases, all in their own home and across 4 GP practices)

S13 (6 cases, 4 in their own home, 2 from nursing home and 2 GP practices one of which accounts for 5 cases)

S5 (8 cases, all in their own home and different GP's)

4.2 GP Surgeries

As with postcodes, wide spread across Sheffield, no real pattern or trends identified except as noted above 5 out the 42 (11%) appeared to be under the care of Woodhouse MC, I suspect this is of no significance.

4.3 Co-Morbid factors

As expected a wide variety of co-morbid factors, no real trends identified, these have been broken down into the number of co-morbid factors present, results are as follows:

Co-morbid factors present in 34 (81%) of the 42 patients.

8 (19%) patients had no co-morbid factors all bar one were under 65 and all resident in their own home.

Of the 34 with co-morbidities no real pattern was identified.

4.4 Antibiotic exposure

This was a key area of investigation, particularly those who had and had not received antibiotics prior to their CDAD and which antibiotics/antibiotic class had they received and the duration of treatment.

4.5 No Exposure:

10 (24%) of the 42 patients had no recorded antibiotic exposure, it is worth noting however that all of these patients lived in their own home and 3 of them had some kind of hospital exposure (outside of the 56 day window) which may be relevant. Only 3 (30%) of the 10 patients were taking a PPI at the time.

4.6 Exposure:

32 (76%) patients had received antibiotics prior to developing CDAD.

6 of the 32 were resident in a nursing home.

4.7 Antibiotic/antibiotic class:

Trimethoprim: 1 patient

Doxicycline: 1 patient

Fluclox & metronidazole: 2 patients

Ciprofloxacin: 2 patients

Cefalexin:	3 patients
Erythromycin:	3 patients
Unknown Antibiotic:	5 patients
Amoxicillin:	7 patients
Co-amoxiclav:	7 patients

4.8 Antibiotic Durations (where obtainable)

1 day:	1 patient
3 days:	1 patient
5 days:	3 patients
7 days:	16 patients
14 days:	3 patients
42 days (cipro):	1 patient

4.9 Antibiotic Indications (where obtainable)

Chest:	18 courses for chest indications
UTI:	8 courses
Cellulitis/soft tissue:	8 courses
Tonsillitis/sore throat	6 courses
Prostatitis:	1 course (cipro)

Three quarters of CDAD patients had antibiotic exposure and as demonstrated above an expected spread of indications and antibiotic choices. Of note the durations seem to be somewhat longer than expected, most indications are for chest and urine which would ordinarily indicate antibiotic durations of between 3 and 5 days.

4.10 PPI's

17 (40%) of the 42 patients were not receiving PPI's at the time of the CDAD, interestingly 7 of these 17 did not receive any antibiotic exposure either. You could question whether there was another cause for the diarrhoea in these patients and how significant therefore was the C.difficile detection?

3 patients were of unknown PPI status leaving 22 (52%) patients on a PPI at the time of their CDAD.

4.11 Contact with Under 2's

Only 1 patient had known contact with under 2's. Whilst obtaining data of this nature is problematic, it does look like an unlikely risk factor based on this cohort.

4.12 Previous Hospital Admissions

6 patients had previous hospital admissions but outside of the 56 day cut-off, this may be relevant but the significance obviously remains uncertain.

4.13 Nursing / Residential Home Residence

7 (16%) of patients were in a nursing home, 35 (84%) were in their own home.

5.0 Recommendations

Approximately 20% of cases are under 65, 20% have no co-morbid factors and almost a quarter of patients had no antibiotic exposure, this combines to make identification of modifiable risk factors somewhat more problematic than previously expected and to some degree may reflect other bowel pathologies as the reason for sending a stool to the lab. The identification of C.difficile may be incidental ie. we could be identifying the 3% of individuals who carry C.difficile in their bowel normally.

Learning point 1: Ensure stool samples sent for correct indications

Three quarters of patients with CDAD did receive prior antibiotic exposure, we must ensure that antibiotic prescribing is rational and where possible in line with the community/PCT formulary. The formulary has been revised to take this in to account, the antibiotics selected appeared for the most part be reasonable however most of the durations were >5 days. It is hard to know without full access to the notes whether all the durations of 7 days or greater were justified.

Learning point 2: Ensure antibiotic indications, choice of agent and duration complies with formulary and clear documentation especially if deviating from formulary advice.

60% of patients received a PPI prior to their CDAD, this is an association which has been suggested several times in CDAD research, it is of course hard to be conclusive but may warrant consideration

Learning point 3: Review community PPI guidance by medicines management.

6.0 Conclusions

The value of this enhanced surveillance appears to be that it has highlighted the complexities of community associated C.difficile infection in that many of the comparisons made with risk factors relevant to secondary care may be of less relevance in primary care. More specifically it has illustrated the difficulties in devising and implementing definitive control measures given the largely sporadic nature of these infections.

In essence the majority of cases are associated with patients in their own home. It has challenged the views that community acquired C.difficile is predominantly seen in nursing/residential home patients and therefore is an issue of infection control in these establishments, whilst its true there have been cases of transmission in these environments it appears to be the exception not the rule in community C.difficile. There are also a significant number of patients who had not received antibiotics and were not taking a PPI and as discussed previously these may represent the 3% carrier state. Achieving year on year reductions of cases in these contexts is will be challenging and the key elements would appear to be:

- Continued vigilance and good infection control in the nursing home setting
- Appropriate sample requesting, to minimise C.difficile detection in the non-symptomatic patients (ie the asymptomatic carriers)
- Roll out and promotion of the antimicrobial formulary to help rationalise prescribing and antibiotic durations
- Medicine management to review the guidance for PPI's

Clearly education and information dissemination will be important in the implementation of the above as will engagement and ownership of community CDAD by general practice. To this end a Healthcare Associated Infections PLI event for GPs is planned in November. This will also provide a forum to promote any further control measures.

NHS Sheffield has developed a C difficile Management Strategy which includes an action plan (Appendix 2). This action plan incorporates the recommendations/learning points in this report.

**Dr Rob Townsend Consultant Microbiologist
Sheffield Teaching Hospitals NHS Trust
On behalf of Penny Brooks, Executive Director Standards and Engagement
August 2011**

Appendix 1:
Community *Clostridium difficile* Data Collection Proforma

Date of telephone call: Interviewer:	HCP providing the information: Name and designation:
Questions	Comments
1. Establish demographics of patient: Name, address, date of birth and NHS Number (should be on hospital database)	
2. Inform GP of patient's <i>C.difficile</i> positive result.	
3. Obtain brief history of <i>C. difficile</i> infection; Onset date, Duration of symptoms (type 5-7?)	
4. Co-morbidities eg: Recent chemotherapy Gastro-intestinal diseases (Inflammatory bowel or diverticular disease), Renal failure, Diabetes, MRSA, COPD Cancer (Solid tumour), COPD	
5. Antibiotic exposure in last 6 month: List all courses and dates of antibiotics prescribed and for what reason/organism	
6. Prior exposure to any or specific gastrointestinal acting drug (proton pump inhibitor, H2 antagonist) in the last 6 months	
7. Has the patient had any recent contact with anyone with diarrhoea?	
8. Occupation (eg healthcare worker/plumber/sewer worker etc)	
9. Do they or other close family members have contact with the under 2's, for example as an "informal carer of grandchildren" and do they change nappies?	
10. Any hospital admissions in the last 6 months? Including dates	
11. Does the patient live in a care home, or sheltered accommodation?	
12. Do they live in their own home with health care or social care support? If yes, please provide more details of the care provided and name of organisation.	
13. Is the patient currently an in patient within an Intermediate Care Facility or attending a day centre? If yes please state name and base.	

Additional Notes

Appendix 2

NHS Sheffield *C. difficile* Action plan 2011-12 updated 3.8.11

Action	Lead	Deadline	Commentary
System Management			
Continue Community case surveillance	Microbiologist	March 2012	Ongoing please see report of 12 months enhanced surveillance from Dr Rob Townsend.
Complete and launch the community antibiotic formulary	Meds Management / Microbiologist	August 2011	Completed. Infections chapter (Prescribing Formulary) now available on intranet. Article included in GP E Bulletin as part of Area Prescribing Committee update on 22.7.11.
Produce pocket guidance for GP's (credit cards) (pending costings)	Microbiologist/IPC Practitioner	September 2011	In progress
Review further the indication of PPI treatment on <i>C. difficile</i> .	Meds Management	September 2011	Work to be commenced shortly.
PLI event for GPs planned in the Autumn 2011	IPCTeam/ Microbiologist	October 2011	The need for the PLI event is being discussed currently with the Clinical Executive.
<i>C. difficile</i> information training for care home staff	IPC Team / Microbiologist	8 July 2011	Completed. Training delivered on 8.7.11
Review of NHS Sheffield <i>C. difficile</i> policy	IPC Practitioner	September 2011	In progress
Commissioning			
SCH to develop an action plan in order to achieve the <i>C. difficile</i> Objective.	IPC Team	July 2011	Developed June 2011 and action on going
Establish effective infection prevention and control practice in care homes - via quality assurance visits and continue IPC training by the Care Home Support Team.	Quality Manager / Care home Support Team	March 2013	Work will commence in September 2011 Work on going by CHST