

Campylobacter bacteraemia: an under-ascertained condition?



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INTRODUCTION

- *Campylobacter* rarely causes bacteraemia.
- Epsom and St Helier University Hospitals (ESTH) has the highest rate of *Campylobacter* infections in London with no obvious cause identified [UK Health Security Agency (UKHSA) data].
- In 2021, *Campylobacter* bacteraemias increased markedly.
- We reviewed the cases of *Campylobacter* bacteraemias in 2021 and to identify trends to support local enhanced surveillance.

METHODS

- We reviewed all positive *Campylobacter* isolations in both stool and blood culture samples between January 2012 and December 2021 using both the ESTH laboratory Telepath system and UKHSA databases.
- De-duplication of patient records was performed using R (version 4.0.3). Samples were grouped by a unique patient identifier and repeat positive samples ≤ 7 days were dropped.
- Records for all patients with a *Campylobacter* bacteraemia in 2021 were subsequently reviewed.
- Comparison with other London and South-East England NHS Trusts with highest number of *Campylobacter* bacteraemias in 2012-2021 (crude results).

RESULTS: *Campylobacter* bacteraemia

- From 2012-2021, 115,870 stool samples were processed, with **6494 (5.60%)** stool samples positive for *Campylobacter* species; with **36** *Campylobacter* bacteraemias.
- An increase in bacteraemias in 2021 (Table 1) to 11 (1.89%).
- Bacteraemias in local hospitals (crude) range from 19 to 46 over 10 years. Highest number of bacteraemias in 2021 was ESTH.

Table 1. Analysis of 10-years of *Campylobacter* data from ESTH, 2012-2021.

Year	Total stool samples processed per year	Stool samples positive for <i>Campylobacter</i> per year	<i>Campylobacter</i> bacteraemias per year	% samples from which <i>Campylobacter</i> was isolated	% positive stool patients who subsequently developed bacteraemia
2012	14754	768	1	5.21	0.13
2013	13719	668	2	4.87	0.30
2014	13471	866	3	6.43	0.35
2015	12820	676	1	5.27	0.15
2016	11811	615	7	5.21	1.14
2017	11163	615	3	5.51	0.49
2018	11191	650	0	5.81	0.00
2019	10916	611	4	5.60	0.65
2020	7781	444	4	5.71	0.90
2021	8244	580	11	7.05	1.90

Source: ESTH laboratory Telepath

Table 2. Analysis of 10-years of *Campylobacter* data from top 10 laboratories reporting bacteraemias, 2012-2021, UKHSA database.

Laboratory Name	<i>Campylobacter</i> bacteraemias In 2021	Stool samples positive for <i>Campylobacter</i> in 2021	%	<i>Campylobacter</i> bacteraemias in previous 10 years	Stool samples positive for <i>Campylobacter</i> in previous 10 years	%
London 3 - ESTH	11	580	1.90	34	6812	0.50
London 1	7	746	0.94	47	3692	1.27
South East 1	7	781	0.90	34	8158	0.42
South East 2	6	427	1.41	33	2453	1.35
London 2	4	808	0.50	34	2964	1.15
South East 3	4	2346	0.17	28	12307	0.23
South East 5	4	927	0.43	25	8478	0.29
South East 6	4	630	0.63	23	5481	0.42
South East 4	3	170	1.76	26	2627	0.99
London 4	1	43	2.33	20	2058	0.97

Source: UKHSA database – SGSS

RESULTS: Patients

Listed below are details of patients with *Campylobacter* bacteraemia (n=11) in 2021. No obvious links of patients by time, place or person.

Demographics

- Average age was 67 (age range 14-89 years, median 73 years)
- 8/11 (73%) were male
- All patients had comorbidities
- 3/11 (27%) were on immunosuppressants
 - 1 on infliximab
 - 1 on prednisolone
 - 1 on both prednisolone and mycophenolate mofetil

Clinical Presentation

- 10/11 (91%) of patients had diarrhoea prior to admission
- 1/11 (9%) had vomiting as the only symptom
- 5/11 (45%) reported a fever
- Average CRP 130 (range 46-178)

Management

- Average length of admission was 6.5 days (range 0-14 days)
- 3/11 patients received 10 days of oral clarithromycin and were not admitted
- 8/11 received 4 days IV meropenem and then either oral clarithromycin or oral ciprofloxacin
- Antibiotic duration varied from 10-42 days
- 2/11 patients required a 6-week course of antibiotics
- Average duration of antibiotics 14.5 days (median 14 days)

Campylobacter species

- Three species of bacteraemias: *C. jejuni* (n= 25, 69%), *C. fetus* (n=6, 17%) and *C. coli* (n=2, 6%). Three isolates were only identifiable to species level (8%).
- Cipro sensitive 7/11 (64%), erythromycin sensitive 11/11 (100%).
- 6/11 samples underwent whole genome sequencing and were all found to be different.
- 5/11 stool samples were sent, with 3/11 positive for *Campylobacter*.

DISCUSSION

- Our review supports literature suggesting predisposing factor of male gender¹
- Although with comorbidities as expected with age, most cases were not immunosuppressed nor had significant contributing co-morbidities
- Despite evidence to suggest increased resistance, we identified no erythromycin resistance
- Virulence changes unlikely as similar pattern not seen in other hospitals, no WGS linkage
- In the last year, the percentage of *Campylobacter* bacteraemias has increased (1.89%) as a proportion of positive stool samples, compared to regional^{2, 3} and hospital 10-year mean.
 - however only three patients in this cohort had *Campylobacter* isolated from their stool
 - suggests underestimate of number of *Campylobacter* infections
 - either samples not being sent (possibly due to patient/GP factors post-pandemic) or laboratory not successfully culturing for *Campylobacter*

REFERENCES

- 1) Feodoroff B, Lauhio A, Ellstrom P, Rautelin H. A nationwide study of *Campylobacter jejuni* and *Campylobacter coli* bacteremia in Finland over a 10-year period, 1998-2007, with special reference to clinical characteristics and antimicrobial susceptibility. *Clinical Infectious Diseases* 2011 53:e99–e106. doi: 10.1093/cid/cir509.
- 2) UKHSA Briefing Note 2021/35. Increased reports of *Campylobacter* spp. infection in England during May 2021.
- 3) Enhanced laboratory surveillance study of *Campylobacter* spp. In England (7 June – 31 Aug 2021). Phase one report (7-30 June 2021), 17 November 2021.