

Intestinal colonization of *Clostridioides difficile* in the pediatric inflammatory bowel disease patients in Japan

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Background

Clostridioides difficile infection (CDI) has been reported to complicate the course of inflammatory bowel diseases (IBD) such as ulcerative colitis (UC) and Crohn's disease (CD). Pediatric IBD patients have more aggressive and extensive diseases than the adults, and consequently they require more antibiotics, corticosteroids and immunosuppressive drugs. The management of CDI may be more crucial in children with IBD, however, there are few studies about the role of *C. difficile* in pediatric IBD in Japan.

Purpose

We investigated intestinal colonization of *C. difficile* in pediatric IBD patients, and its correlation with disease activity of IBD.

Materials and Methods

Eleven UC patients and one CD patient (5-15 years of age, average age: 10.7 years) were examined. *C. difficile* was cultured from their stool specimens and toxin-producing type of recovered isolates was tested by PCR detecting the genes encoding toxin A, toxin B and binary toxin. The isolates were analyzed by PCR ribotyping. Pediatric Ulcerative Colitis Activity Index and Pediatric Crohn's Disease Activity Index were used to categorize the IBD condition in patients with UC and CD, respectively, when stool specimens were collected.

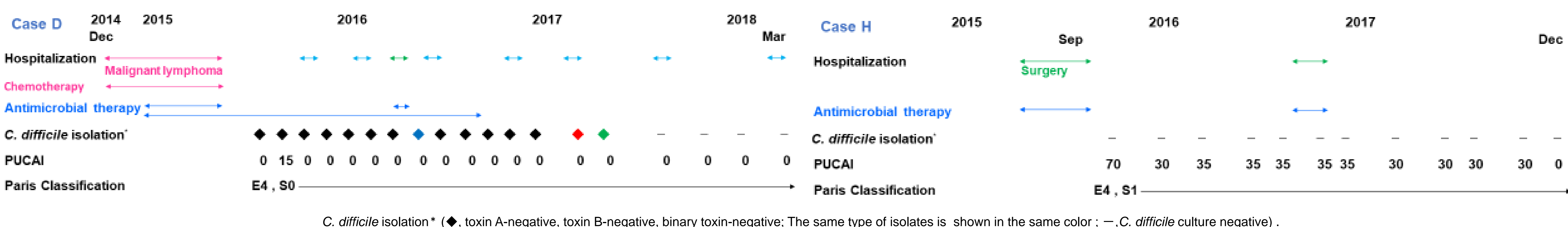
Results

Clinical background of 12 patients and *C. difficile* isolation

Case	Sex	Age (year)	Diagnosis	³ PUCAI / ⁴ PCDAI average(range)	Paris classification	No. of stool samples tested	No. of <i>C. difficile</i> -positive samples	⁵ toxin-producing type	PCR ribotype	CDI occurrence	Antibiotic exposure in previous 3 months	Cortico-Steroids exposure in previous 3 months
A	F	11	UC	0	E3, S0	1	0	⁶ NA	NA	NO	NO	NO
B	M	14	UC	0	E4, S0	1	0	NA	NA	NO	YES	NO
C	F	14	UC	0	E4, S1	2	1	A ⁻ B ⁻ CDT ⁻	MI1618	NO	NO	NO
D	F	6	UC	0.79 (0-15)	E4, S0	19	15	A ⁻ B ⁻ CDT ⁻	MI1501/MI1612/MI1701/MI1705	NO	YES	YES
E	M	8	UC	15	E4, S0	1	0	NA	NA	NO	YES	NO
F	M	13	UC	15	E4, -	2	1	A ⁻ B ⁻ CDT ⁻	MI1609	NO	YES	NO
G	F	10	UC	30	E4, S1	1	0	NA	NA	NO	YES	YES
H	M	13	UC	35.9 (0-70)	E4, S1	12	0	NA	NA	NO	YES	NO
I	F	10	UC	40	E4, S1	1	0	NA	NA	NO	YES	YES
J	M	5	UC	85	E4, S1	2	0	NA	NA	NO	YES	NO
K	F	5	UC	-	-	4	0	NA	NA	NO	NO	NO
L	M	13	CD	15	A1b, L2, B2, G1	2	1	A ⁺ B ⁺ CDT ⁻	type 014	NO	YES	NO

¹Sex(F,Female; M, Male); ²Diagnosis(UC, ulcerative colitis; CD, Crohn's disease); ³PUCAI, Pediatric Ulcerative Colitis Activity Index; ⁴PCDAI, Pediatric Crohn's Disease Activity Index; ⁵toxin-producing type (A-B-CDT-, toxin A-negative, toxin B-negative, binary toxin-negative; A+B+CDT-, toxin A-positive, toxin B-positive, binary toxin-negative); ⁶NA, not applicable.

Clinical course and *C. difficile* isolation in cases D and H



Summary

- A total of 48 stool specimens were obtained from 12 IBD pediatric patients.
- Disease activity index ranged 0 to 85 points (average 17.5 points) among 11 UC patients, and was 15 points in one CD patient.
- Of 46 specimens from UC patients, 17 were positive for *C. difficile*.
- Among 17 isolates recovered from 3 UC children, 6 different PCR-ribotypes were identified. The child with CD was examined twice, and *C. difficile* was recovered on one of the occasions.
- Of 18 isolates obtained, only one from a UC patient was toxin A-positive, toxin B-positive binary toxin-negative and typed as PCR-ribotype 014, and the remaining 17 were all non-toxigenic.
- The disease activity scores in 4 patients when *C. difficile* was isolated were low from 0 to 15 points. 2015