

国際学会報告

**N-3 polyunsaturated fatty acids intake and serum fatty acid levels
in patients with Crohn's Disease**

—Comparison with ulcerative colitis patients—

ASPEN (American Society for Parenteral and Enteral Nutrition)

2017 Nutrition Science & Practice Conference in Orlando, USA

クローン病患者の n-3 系不飽和脂肪酸摂取と血清脂肪酸の特徴

—潰瘍性大腸炎患者との比較—

ASPEN (アメリカ静脈経腸栄養学会) 2017、栄養科学・実践カンファレンス、
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Michiko Nakamura¹⁾
中村美知子¹⁾

Yoko Oohinata²⁾
大日向陽子²⁾

キーワード：n-3 系多価不飽和脂肪酸摂取、血清脂肪酸、クローン病患者、潰瘍性大腸炎患者

key words：n-3 polyunsaturated fatty acids intake, serum fatty acid levels, Crohn's disease patients, ulcerative colitis patients

要 旨

ASPEN (American Society for Parenteral and Enteral Nutrition) は 1976 年に米国で設立され、臨床栄養・代謝の研究と実践を通して患者のケアを改善することを目指している¹⁾。世界中に会員がおり、2017 年現在 6,500 名以上で構成され、メンバーは医師、管理栄養士、薬剤師、看護師、研究者、学生などである。会員は、栄養サポートに関する臨床実践、研究、教育の向上を追究している。

ASPEN2017 年は、2 月 18 日～21 日に米国の Orlando World Center Marriott Resort and Convention Center in Orlando で開催され、メインテーマは Clinical Nutrition Week (CNW：臨床栄養研究) であった。発表テーマや内容は臨床における患者の栄養管理の基礎研究・実践研究に関する大変興味深いものであった。以下、筆者らが発表した「クローン病患者の n-3 系多価不飽和脂肪酸摂取と血清脂肪酸の特徴—潰瘍性大腸炎患者との比較—」を紹介する。

1. Introduction

Daily n-3 polyunsaturated fatty acids (PUFAs) intake is important for patients with inflammatory bowel disease²⁻³⁾. In this study, we compared n-3 PUFAs intake and serum fatty acid levels between patients with Crohn's disease and patients with ulcerative colitis. Based on the results, we provide suggestions for

dietary n-3 PUFAs consumption for these patients.

2. Methods

The 22 outpatient participants had either Crohn's disease (CD group; n = 11) or ulcerative colitis (UC group; n = 11) (Table 1). The participants' dietary intakes (including nutritional intake) were surveyed at home every

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1) 共立女子大学 看護学部 2) 山梨大学大学院 総合研究部

other week for 2 months, resulting in five data sets per participant. Nutritional Value Calculator Software ver6.0 (Kenpakusha, Japan) was used to calculate nutritional intake. Serum triglycerides (TG), total cholesterol (T-cho), high-density lipoprotein cholesterol (HDL-cho), low-density lipoprotein cholesterol (LDL-cho), total saturated fatty acids (SFAs), monounsaturated fatty acids (MUFAs) and PUFAs levels were determined. Blood samples were collected three times during the survey's period.

Data Analysis: Student's t-tests were used to evaluate the differences in nutritional consump-

tion and serum lipid levels between the two groups.

3. Results

In the CD group, average daily intakes of PUFAs (6.8 ± 3.8 g), n-3 PUFAs (1.1 ± 0.5 g), and n-6 PUFAs (5.5 ± 3.5 g) were significantly lower than in the UC group ($p < 0.05$), while the n-6/n-3 intake ratio was 6.6 ± 3.4 (6.4 ± 2.3) in the CD group (Table 2). In addition, EPA and DHA intakes were low in both groups (Fig.1). The CD group consumed significantly less meat (55.3 ± 31.4 g) and fat (6.1 ± 5.4 g)

Table 1 Characteristics of subjects N=22

		CD (n=11)		UC (n=11)		P value ^{§1}
		Mean	± SD	Mean	± SD	
Age	(y)	34.5	± 11.6	40.3	± 8.4	0.523
Duration of IBD	(y)	9.2	± 8.7	8.3	± 8.1	0.531
BMI		22.0	± 3.8	22.7	± 5.1	0.498
Male	n(%)	10 (90.8)		7 (63.6)		

§1 Student's t-test was used to calculate the statistical significance($p < 0.05$).

Table 2. Nutrients and Food intake in Crohn's disease patients
—Comparison with ulcerative colitis patients— N=22

Nutrients / day ^{§2}		CD (n=11) ^{§3}		UC (n=11)		P value ^{§1}
		Mean	± SD	Mean	± SD	
Total energy	(kcal)	1898.9	± 424.5	1987.3	± 295.9	0.577
P:F:C ratio		16.2 : 15.2 : 68.6		15.6 : 27.3 : 57.1		-
Total fat	(g)	32.2	± 20.9	59.9	± 12.6	0.001
Cholesterol	(mg)	275.5	± 147.0	431.8	± 94.2	0.008
SFA	(g)	9.2	± 6.7	16.9	± 4.6	0.005
MUFA	(g)	10.9	± 7.9	21.1	± 4.6	0.001
PUFA	(g)	6.8	± 3.8	12.4	± 3.1	0.001
n-6 PUFAs	(g)	5.5	± 3.5	10.4	± 2.7	0.001
n-6/n-3 ratio		6.6	± 3.4	6.4	± 2.3	0.908
Food intake / day^{§2}						
Grains	(g)	390.7	± 150.2	453.2	± 104.8	0.271
Vegetables	(g)	178.7	± 137.5	232.2	± 109.3	0.325
Pulses	(g)	18.4	± 17.3	47.9	± 44.4	0.054
Fish and shellfish	(g)	51.9	± 50.0	58.4	± 26.9	0.706
Meat	(g)	55.3	± 31.4	96.0	± 33.0	0.008
Eggs	(g)	36.7	± 34.4	58.9	± 13.6	0.060
Dairy Product	(g)	41.7	± 84.0	63.7	± 47.7	0.459
Fats and Oils	(g)	6.1	± 5.4	12.6	± 5.8	0.014

§1 Student's t-test was used to calculate the statistical significance($p < 0.05$).

§2 The date indicates the mean ± standard deviation of the five days dietary intakes.

§3 Six participants(54.5%) used elemental diet and the average daily energy intake was 950.0 ± 216.1 kcal.

than the UC group ($p < 0.05$). Fish and shellfish intake in the CD group was 51.9 ± 50.0 g and was not significantly different between the groups (Table 2). In the CD group, serum n-3 PUFAs ($147.8 \pm 34.5 \mu\text{g/mL}$), and DHA ($83.3 \pm 22.2 \mu\text{g/mL}$) levels were significantly lower than in the UC group ($p < 0.05$), and the n-6/n-3 serum ratio of 6.5 ± 2.1 (5.9 ± 1.3 in the UC group) was high. Additionally, the CRP level was 1.1 ± 1.0 mg/dL and the ESR was $21.7 \pm$

17.4 mm/h in the CD group (Fig.2, Table3).

4. Conclusions

The n-3 PUFAs intake in the CD group was lower than that in the UC group. The n-6/n-3 intake ratio and serum n-6/n-3 ratio in both groups were high. In the CD group of the n-3 PUFAs, EPA and DHA intakes were particularly low. Increasing intake of EPA- and DHA-en-

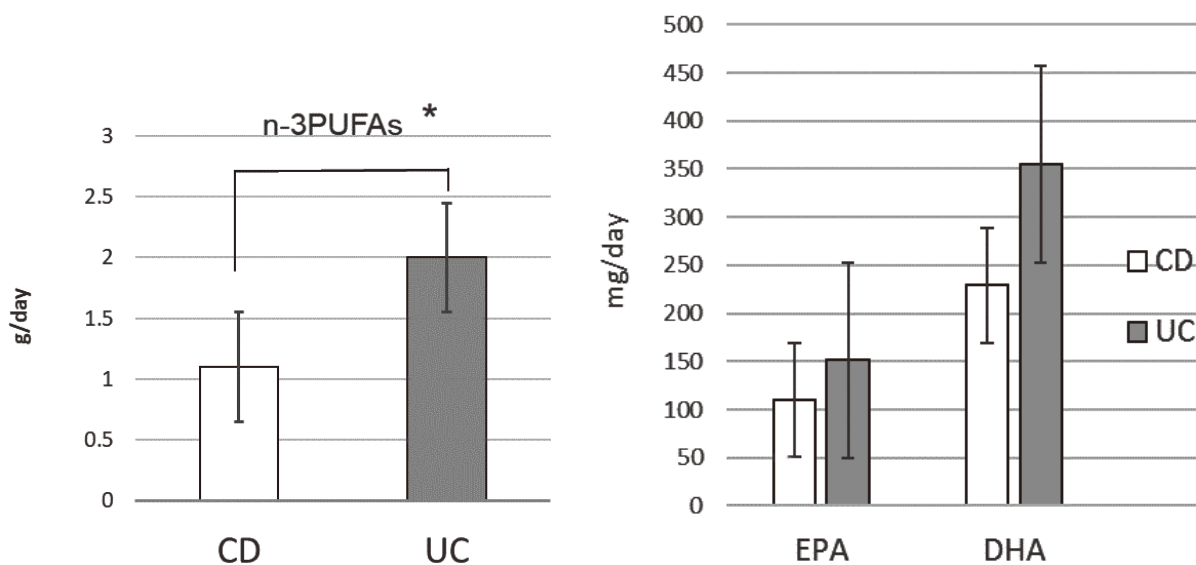


Fig. 1 Intake of n-3 PUFAs, EPA, and DHA in Crohn's disease patients —Comparison with ulcerative colitis patients— :

* Student's t-test was used to calculate the statistical significance ($p < 0.05$)

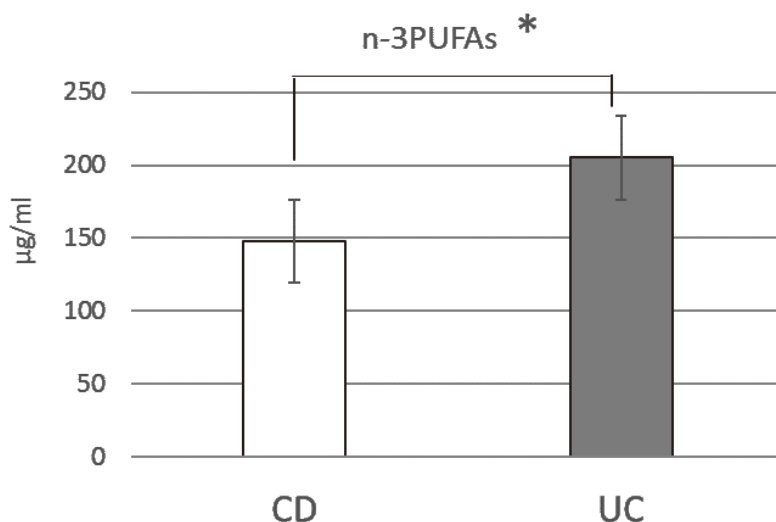


Fig. 2 Serum n-3 PUFAs, EPA, and DHA in Crohn's disease Patients —Comparison with ulcerative colitis patients— :

* Student's t-test was used to calculate the statistical significance ($p < 0.05$)

Table 3 Serum lipid composition in Crohn's disease patients
—Comparison with ulcerative colitis patients—

		N=22						
		CD(n=11)			UC(n=11)			P value ^{§1}
Serum lipids		Mean	±	SD	Mean	±	SD	
TG	(mg/dL)	108.8	±	31.2	102.9	±	43.6	0.720
T-cho	(mg/dL)	146.4	±	33.7	181.2	±	38.1	0.034
HDL-cho	(g/dL)	45.2	±	10.1	55.5	±	13.2	0.540
LDL-cho	(g/dL)	83.8	±	29.0	106.5	±	33.6	0.100
SFA	(µg/mL)	922.5	±	234.3	941.0	±	206.9	0.840
MUFA	(µg/mL)	701.0	±	131.7	675.6	±	202.2	0.730
PUFA	(µg/mL)	1058.2	±	273.0	1342.6	±	292.1	0.290
n-6 PUFAs	(µg/mL)	907.2	±	271.6	1135.3	±	257.0	0.570
n-6/n-3 ratio		6.5	±	2.1	5.9	±	1.3	0.460
CRP	(mg/dL)	1.1	±	1.0	0.6	±	0.7	0.115
ESR	(mm/h)	21.7	±	17.4	11.5	±	13.8	0.142

§1 Student's *t*-test was used to calculate the statistical significance($p < 0.05$).

riched foods (e.g., fish) would be able to improve serum n-3 PUFAs levels and alleviate inflammation⁴.

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