

**RAPID IMPROVEMENT OF SEVERE ANOREXIA NERVOSA DURING  
TREATMENT WITH ETHYL-EICOSAPENTAENOATE AND  
MICRONUTRIENTS**

*AK Ayton MD, MSC, MRCPsych (Corresponding author)*

*Hull and East Riding Community Health NHS Trust, Child and Adolescent*

*Service, 2062-68 Hessle Rd, Hessle. East Yorkshire, HU13 9NW*

*E-mail: A.K.Ayton@hull.ac.uk*

*A Azaz MBBch, DCH, MRCP, MRCPCH*

*Hull Royal Infirmary, Department of Paediatrics, Anlaby Rd, Hull HU3 2JZ*

*DF Horrobin MA, DPhil, BM, BCh*

*Laxdale Research, Kings Park House, Laurelhill Business Park, Stirling FK7*

*9JQ*

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Anorexia nervosa usually starts in adolescence, and it carries the highest risk of morbidity and mortality amongst all psychiatric disorders.<sup>1</sup> A recent large prospective follow-up study found no clear evidence for efficacy of any treatment regime, highlighting the need for new approaches.<sup>2</sup> Despite the fat-phobic nature of the disease, surprisingly little work has been done on the details of fatty acid metabolism although serious deficits of essential fatty acids (EFAs), including n-3 EFAs, have been reported.<sup>3,4</sup> Current refeeding programmes do not take into consideration n-3 EFA intake, possibly leading to further dilution of body stores during weight restoration. This may contribute to deteriorating mood and early relapse, both of which are very common after weight restoration. Three recent trials of ethyl-eicosapentaenoate in treatment-unresponsive depression have shown substantial improvement.<sup>5-7</sup> This led us to try this approach as an adjunct to treatment in a severely ill 15 year old with anorexia nervosa.

#### CASE REPORT

The patient was 15 years old when first seen by child psychiatry services with an approximately 14-month history of increasing eating difficulties. There was a family history of depression and polycystic ovary syndrome. Her menarche started at the age of eleven. The dieting was precipitated by a number of psychosocial stressors. Her food restriction became increasingly worse and she had stopped eating all solids two months before the referral. She had also started laxative abuse and excessive exercise. As a result, she developed a rapid weight loss, secondary amenorrhoea, and lanugo hair. She often felt dizzy and cold. She had abnormal cognitions regarding her weight and shape. On the first examination she was 55 kg and her height was 1.63 metres.

Although these were within normal range, she had lost 8 kg during the previous 6 weeks.

After the first assessment, outpatient treatment was offered, which consisted of family therapy, psycho-education, dietary advice and paediatric monitoring. This achieved no change, and she continued to lose weight rapidly. Attempts to admit her to an adolescent psychiatric unit failed initially, and she was only admitted approximately 2 months later weighing 44.4 kg. At this stage, she was extremely distressed, and hardly accessible. She was unable to maintain a conversation. She had a profound fear of eating, was preoccupied with being fat and wanted to lose more weight. She was emaciated, her hair and skin were dry. She was bradycardic. Her white cell count was  $2.2 \times 10^9$  g/L. Despite intensive nursing, she was unable to consume anything orally and had to be transferred to the paediatric ward a few days later when her pulse rate dropped to 42/min and her serum glucose to 2.2 mmol/l. There she was treated by naso-gastric feeding on parental consent. Forceval multinutrient (1/day) capsules were prescribed to correct her micronutrient deficiencies (Selenium 0.68 umol/L, Zinc 9.5 umol/L, Copper 8.5 umol/L). The parents and the patient consented to a 3-months trial of 1g/day ethyl-eicosapentaenoate (provided by Laxdale Ltd). With the naso-gastric feeding she gradually gained weight and began to eat orally, but her mother discharged her prematurely against medical advice. The patient had only been on ethyl-EPA for two weeks by this time, and left the hospital without it. She lost 5kgs within the next ten days.

At this point, it was felt unsafe to treat her any longer on a voluntary basis, and she was detained under the Section 3 of the Mental Health Act. She remained an inpatient

on the adolescent psychiatric ward for the next two months. Initially, she required bed-rest and intensive nursing, but she was willing to continue with her Forceval and ethyl-eicosapentaenoate supplements. Within weeks, there was a gradual improvement in her diet, weight, and her mood. By the end of 3 months of ethyl-eicosapentaenoate and Forceval, she was able to take responsibility for her diet. Her abnormal cognitions entirely disappeared, she became interested in her environment, and in her future, and started feeling confident about herself and her body again. She was discharged from the section, and returned home. She enrolled onto a college course and took up a summer job, without any further relapse. Apart from the amenorrhoea, which was not resolved due to polycystic ovary syndrome, her functioning returned to normal in all respects (Table 1).

## DISCUSSION

To our knowledge, this is the first case report in the literature using ethyl-eicosapentaenoate as an adjunct in the treatment of anorexia nervosa. The patient, who had been deteriorating despite several months of traditional treatment, showed a remarkable and rapid improvement by the end of 3 months of ethyl-eicosapentaenoate and micronutrient supplementation. It is unlikely that this change was achieved by the compulsory admission, as this is usually associated with poor outcome.<sup>8</sup> N-3 fatty acids (particularly eicosapentaenoic acid and docosahexaenoic acid) have been shown to be helpful in a number of diseases,<sup>9</sup> including cancer cachexia<sup>10</sup>, and they are essential for normal development and growth in childhood.<sup>11</sup> Most recently, the n-3 derivative ethyl-eicosapentaenoate has been found effective in treatment-unresponsive depression.<sup>12</sup> Considering that cachexia and depression are characteristic features of anorexia nervosa, and that patients usually avoid dietary fats, n-3 fatty acid

supplementation might be beneficial for this patient group. Our case confirms this theoretical possibility. We propose that ethyl-eicosapentaenoate and micronutrient supplementation during re-feeding might offer a novel treatment for anorexia nervosa sufferers, and further studies are warranted to explore this approach.

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symptom remission, structural brain changes and reduced neuronal phospholipid turnover. *International Journal of Clinical Practice* 2001; **55**: 560-3.

Table 1. Changes in physical and psychological measures before and after ethyl-EPA  
and micronutrient supplementation

Month <sup>1</sup>	Weight	BW% <sup>2</sup>	Ethyl- EPA <sup>3</sup> g/day	Forceval (caps)	MR <sup>4</sup> (average)	MR-A	MR-B	MR-C	MR-D	MR-E	GAF <sup>5</sup>	CGS <sup>6</sup>
-2	63.00	114.5										
0	55.00	100.0										
1	51.10	96.3			1.9	2.67	0	4	2	1	25	6
2	47.00	85.4			1.9	2.67	0	4	2	1	15	7
3	42.80	76.3			1	0	0	4	1	0	20	7
4	45.50	82.7	1	1	1.2	0	0	4	2	0	11	7
5	45.20	82.0	1	1	1.6	0	0	4	3	1	15	6
6	50.40	89.2	1	1	4.1	7.67	0	8	3	2	45	4
7	57.00	101.0	1	1	8.2	12	0	12	8	9	75	2
8	62.20	110.7			8.9	12	0	12	9.5	11	85	1
9	65.40	114.0			9.1	12	0	12	10.5	11	85	1

<sup>1</sup> Month 0: the time of the first assessment by specialist services

<sup>2</sup> BW%: percentage of average body weight for height and age

<sup>3</sup> Ethyl-EPA & Forceval treatment started at month 4 and continued for the next 3 months as a part of a re-feeding programme

<sup>4</sup> Morgan-Russel Outcome Scale (0-12: severe problem- normal) MR-A: food intake, MR-B: menstrual pattern, MR-C: mental state, MR-D: psychosexual state, MR-E: socioeconomic state

<sup>5</sup> GAF: General Assessment of Functioning (0- 100: life threatening problems - high level of functioning in all aspects of life)

*Rapid improvement of severe anorexia...*

CGS: Clinical Global Severity (1-7: normal- severely ill)