



## Short communication

## Successful treatment of OCD with a micronutrient formula following partial response to Cognitive Behavioral Therapy (CBT): A case study

Julia J. Rucklidge\*

Department of Psychology, University of Canterbury, Private Bag 4800, Christchurch, New Zealand

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## ABSTRACT

Obsessive Compulsive Disorder (OCD) affects 0.5–2% of young people many of whom are resistant to conventional treatments. This case study describes an 18-year-old male with OCD who first underwent cognitive behavioral therapy (CBT) for a 1-year period with a modest response (his OCD had shifted from severe to moderate). Within a year, his anxiety had deteriorated back to the severe range and he now had major depression. He then entered an ABAB design trial using a nutritional formula consisting mainly of minerals and vitamins (together, known as micronutrients). After 8 weeks on the formula, his mood was stabilized, his anxiety reduced, and his obsessions were in remission. The treatment was then discontinued for 8 weeks, during which time his obsessions and anxiety worsened and his mood dropped. Reintroduction of the formula again improved the symptoms. This case illustrates the importance of considering the effect micronutrients have on mental illness.

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Reviews, meta-analyses, and practice parameters recommend cognitive behavioral therapy (CBT), either alone or in conjunction with a selective serotonin reuptake inhibitor (SSRI), as a frontline treatment for adolescents with Obsessive Compulsive Disorder (OCD) (Barrett, Farrell, Pina, Peris, & Piacentini, 2008; Watson & Rees, 2008). However, even with the more well designed studies and strict inclusion/exclusion criteria, response rates can be as low as 21% for an SSRI (Pediatric OCD Treatment Study Team, 2004). Remission rates are better with CBT-based approaches, with response rates ranging from 40% to 85% (Barrett et al., 2008). However, clinical management of those treatment-resistant cases is an area that is under-investigated (Fineburg, Nigam, & Sivakumaran, 2006). Further, presence of co-occurring disorders has a negative impact on treatment response (Storch et al., 2008) and side effects can be intolerable. Scientific evaluations of other methods are required.

Few alternative approaches to the treatment of OCD have been empirically tested, and those that have been performed more typically utilize a single ingredient approach. Inositol (18 g/day for 6 weeks) has been shown to be more effective than a placebo (Fux, Levine, Aviv, & Belmaker, 1996); however, even after treatment, the means on the Yale-Brown Obsessive Compulsive Scale (Y-

BOCS) remained in the moderate range of symptoms (>15). Fux and colleagues have also investigated eicosapentaenoic acid (EPA) in comparison to a placebo in a cross-over design with 11 patients with OCD: 2 g EPA added to an SSRI for 6 weeks did not differ from 2 g paraffin placebo (Fux, Benjamin, & Nemets, 2004). Prousky (2005) found niacinamide (2000–2500 mg/day) relieved anxiety in three patients.

An alternative approach is to use a more broad-based intervention consisting of multi-ingredients rather than one ingredient at a time. The intervention described in this study stemmed from a published case report by Kaplan, Crawford, Gardner, and Farrelly (2002), who described a child with a severe obsession with guns and knives. The child was treated on a formula currently called EMPowerplus (EMP+)<sup>1</sup> that consists of 14 vitamins, 16 minerals, 3 amino acids and 3 antioxidants; treated in an ABAB design, the child showed significant improvement and indeed remission from his obsessions while on the active ingredients. There is a growing body of research that shows that vitamin and mineral deficiencies can be corrected with the use of

<sup>1</sup> Developed by Truehope Nutritional Support Ltd., the formula was initially called EMPower. In 2002 the company changed manufacturers to use methods that decreased the number of capsules and improved the bioavailability of the product. The resulting product has the same 36 ingredients, but was given the new name EMPowerplus. The current formula can be found on the developer's website (<http://www.truehope.com>).

\* Tel.: +64 3 364 2987x7959; fax: +64 3 364 2181.  
 E-mail address: [julia.rucklidge@canterbury.ac.nz](mailto:julia.rucklidge@canterbury.ac.nz).

supplements and specifically, mood problems can be ameliorated with both single nutrients and complex formulations (Gately & Kaplan, *in press*; Kaplan, Crawford, Field, & Simpson, 2007). The case study reported here involves an 18-year-old male, referred to as SJ, who was treated initially with CBT. Then, following a relapse, he participated in an ABAB design using EMP+.

**1. Method and results**

SJ was first referred in April 2006, at age 16 years, to a youth specialty service that assesses and treats adolescents with severe mental illness. The psychiatrist diagnosed him with OCD (of at least 3 years duration) and Asperger’s Disorder. He had high levels of anxiety and obsessions, mostly about safety issues: fears of getting hurt, that his house was going to burn down, and that his brains were going to fall out. He also had religious obsessions such as fear of becoming a non-Christian. His compulsions typically reduced these fears, such as drinking lots of water (to prevent the house burning down), stretching his head (to stop his brains falling out), or washing his hands repeatedly (fear of germs). The family declined pharmacological options but was happy to be referred to the author for psychological treatment.

*1.1. Intervention with CBT*

Before CBT, SJ’s Y-BOCS score (Goodman et al., 1989a,b) was 29 (severe range). The author followed a standard CBT approach (March & Mulle, 1998), including exposure and response prevention, developing hierarchies, talking back to the obsessive thoughts, thought challenging and developing rewards. SJ was seen for 27 sessions of CBT over a 1-year period. During that time, he was able to eliminate many of his obsessions, although the elimination of one obsession was often followed by its replacement with a new one. It also became apparent that some of the rituals (e.g., neck stretching) were better conceptualized as motor tics. After 6 months of weekly or bimonthly treatment, his Y-BOCS score had decreased from 29 (severe range) to 16 (moderate range) where it remained until discharge. While he continued to experience obsessions, he was better able to resist them.

*1.2. Baseline (prior to the nutritional intervention)*

In February 2008, almost a year after termination of CBT, SJ’s mother called the author and reported that SJ’s OCD had worsened, his mood was more depressed, and she was concerned about his suicide risk. On assessment, the author confirmed the presence of significant religious obsessions. SJ continued to meet DSM-IV-TR criteria for OCD, and in addition he now met criteria for Major Depressive Disorder (MDD) of 4-week duration. SJ reported he spent approximately 80% of his waking time obsessing about God, unforgivable sin and unrelenting fear of going to hell. His mother said that evenings were particularly difficult, her husband spending hours with SJ attempting to reassure him. He obtained a score in the severe range (24) on the Y-BOCS; however, SJ was mostly experiencing obsessions. His compulsions were less severe compared with when he was seen for CBT: his obsession score on the Y-BOCS was 19 (maximum is 20) but his compulsion score was only 5.

The family was informed of treatment options in the community (he was now too old for the adolescent service) including medications, CBT, and a referral to the adult anxiety disorder unit. They were also informed of the case studies using EMP+ to treat obsessions and mood disorders as well as the experimental nature of the treatment. The family chose to begin a trial of EMP+ and written consent was obtained from the patient to begin the trial.

*1.3. Measurement of outcome*

Measures were selected to monitor treatment response over time: the Beck Depression Inventory (BDI-II; Beck, Steer, & Brown, 1996); the Beck Anxiety Inventory (BAI; Beck, Epstein, Brown, & Steer, 1988); the Global Assessment of Functioning (GAF), a DSM-IV-based assessment of overall functioning (American Psychiatric Association, 2000); the Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001), a parent completed questionnaire about all psychiatric problems of childhood, and the Outcome Questionnaire (OQ; Umphress, Lambert, Smart, Barlow, & Clouse, 1997). The OQ was developed for measuring change in treatment, assessing broadly across symptom distress, interpersonal relationships and social role performance. Based on community and patient data, a cutoff of 63 is used to indicate whether an OQ score is more typical of a patient sample or a community sample. Figs. 1 and 2 illustrate his baseline scores, indicating SJ was experiencing clinically elevated mood and anxiety symptoms, confirmed by self-report, parent-report and clinician assessment.

*1.4. First intervention with micronutrient formula*

SJ began the micronutrient formula at two capsules three times a day and titrated up over a 1-week period to the full dose of 15 per day divided into three equal doses, taken with food and plenty of water. The formula consists of 36 ingredients<sup>1</sup> primarily minerals, vitamins, and amino acids, in quantities higher than an individual’s usual level of daily dietary intake (Kaplan et al., 2001). No adverse effects were encountered. His compliance was excellent in that he easily swallowed the 15 capsules per day. After 1 week, no changes were reported by the patient or his family. However, at 3 weeks, there was a notable change in SJ. His mood had lifted (BDI: 19) and his anxiety had dropped markedly (BAI: 12). His OCD was still present but more manageable, less distressing and less interfering. His Y-BOCS score was 12, the lowest it had been in over 4 years.

SJ was followed every few weeks for a 2-month period. Four weeks after starting the treatment, SJ remarked that while his obsessive thoughts still occurred frequently, he found it easy to ignore them. He also reported that his obsessions typically occurred for a few seconds to a minute and then would stop, without the need to perform a ritual or without dwelling on them.

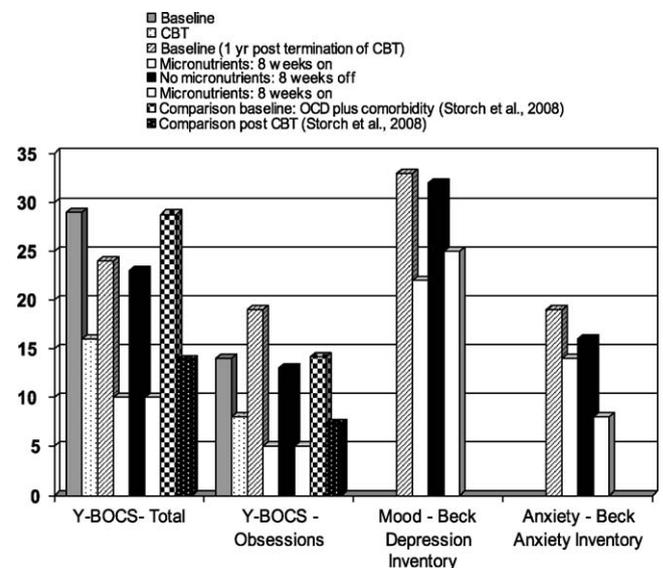


Fig. 1. Clinician rated scores on the Yale-Brown Obsessive Compulsive Scale with comparison data (Storch et al., 2008), and self-report scores on the Beck Depression Inventory and the Beck Anxiety Inventory.

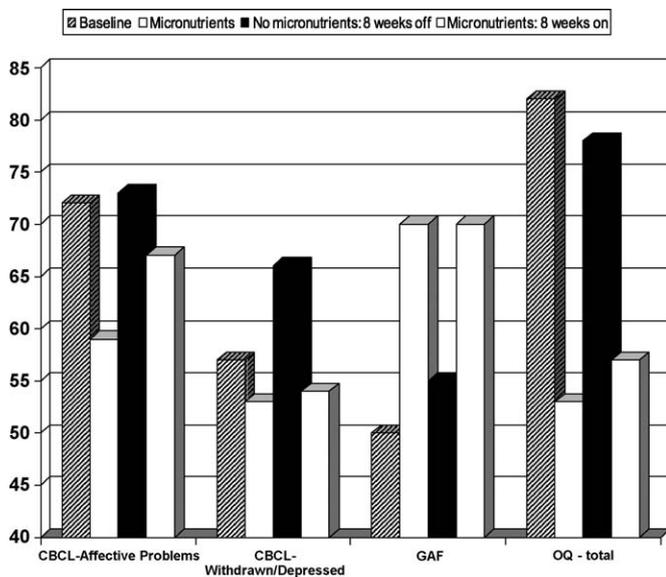


Fig. 2. Parent-report on the Child Behavior Checklist and overall outcome measures for global functioning as measure by the self-report Outcome Questionnaire and the Global Assessment of Functioning.

This report was in contrast to pre-treatment when he could obsess for hours without relief. His mother could not recall a time when she had seen SJ's anxiety so low. Although up to this point SJ had wondered if the change in his OCD had simply coincided with taking the micronutrients, he now considered that this degree of change would be unlikely without an active intervention.

Outcome measures were repeated at 8 weeks (Figs. 1 and 2). Although his mood had improved, the BDI score was still relatively high (20) with elevations continuing on items related to guilt, punishment, self-dislike and self-criticalness. The CBCL, BAI and the Y-BOCS confirmed significant changes in anxiety. His OQ score had decreased into the range found in community samples. Fig. 1 also compares the Y-BOCS results reported by Storch et al. (2008) in their treatment study of youth with OCD and comorbid disorders using CBT; the results using this micronutrient show a better outcome.

At this point, SJ decided to discontinue treatment to determine whether it was the treatment or the passage of time that had caused the change in symptoms. He was aware that symptoms could return and consented to be monitored during the withdrawal phase.

### 1.5. Treatment withdrawal

Ten days after the treatment was stopped, mild symptoms began reappearing and reassurance seeking was becoming more evident. At 3 weeks, SJ experienced a significant increase in his obsessions, with a Y-BOCS score of 22 (moderate). He woke his family screaming when the obsessions became too overwhelming for him. He had 3 days of constant obsessions while on a camping trip; he reported crying, feeling he was going to hell, having thoughts telling him to eat only certain types of food, and telling him not to draw (during the treatment phase, SJ had resumed expressing his artistic talents by drawing, after years of abstinence). He noted that his background anxiety was getting noticeably worse as well (BAI increased to 21; his BDI-II was 28). SJ then experienced an improvement in his symptoms for a few weeks (Y-BOCS reduced to 14; BDI-II to 24 and BAI to 14) and then deterioration in symptoms occurred again.

After 8 weeks off the micronutrients, the outcome measures were repeated (Figs. 1 and 2). All measures indicated that the

obsessions had increased in severity, mood had dropped and anxiety increased. His OCD symptoms were in the high end of the moderate range of the Y-BOCS (23). It was recommended that some form of treatment needed to be reinstated. All options were reviewed and SJ decided to resume EMP+.

### 1.6. Reintroduction of nutrient treatment

Twelve days after reinstating EMP+, SJ's scores had dropped. His BDI-II score was 24, his BAI was 7 and his Y-BOCS score was 12 (6 for obsessions). By 4 weeks, SJ's Y-BOCS score (10) indicated the OCD symptoms were back in remission. SJ's OCD remained at this level although once every couple of weeks, he had small bursts of distressing obsessions that would last a few minutes until he regained control.

Figs. 1 and 2 illustrate the changes observed after 8 weeks back on the micronutrients. Anxiety had decreased and obsessions reduced. His mood had also lifted somewhat but fell within a moderate range. Although he reported no sad feelings, he was still endorsing items related to guilt, feeling inferior, and low self-esteem. On inquiry, it seemed evident that these rankings were driven more by his religious beliefs and concrete thinking associated with Asperger's Disorder than by low mood. He no longer met criteria for a major mood disorder. He was recontacted 6 months later (he was still taking EMP+) and he continued to be in remission (Y-BOCS = 10) with further improvements to his mood (BDI = 17) and maintenance of low anxiety (BAI = 10). Indeed, he remarked that his anxiety had continued to improve without on going therapeutic contact.

## 2. Discussion

SJ's response to the intervention has been classified by others as an "excellent response" as indicated by post-treatment Y-BOCS  $\leq 10$  (Pediatric OCD Treatment Study Team, 2004). Moreover, this change occurred within a shorter time frame than that reported in the Pediatric OCD Treatment Study Team (POTS) study. The treatment response was replicated through an ABAB design, showing on-off control of the symptoms with the micronutrients.

Of significant clinical interest, no side effects were reported while on EMP+. Perhaps more importantly, SJ had previously exhibited only a modest treatment response to CBT (as evidenced by his Y-BOCS score of 16 post-CBT) and therefore, he represents a treatment-resistant case of OCD. Indeed, a score of 16 on the Y-BOCS is often used as one inclusion criterion for treatment studies (cf. Storch et al., 2008). In addition, at the beginning of his treatment with EMP+, SJ also met criteria for MDD and Asperger's Disorder, and he had substantial motor tics. These co-existing conditions are often used as exclusion criteria for large trials of CBT, or when included, negatively impact treatment response (Storch et al., 2008). Further, this patient represents the first and only OCD patient followed by the researcher using EMP+: i.e., he does not represent a treatment success amongst a group of treatment failures.

It is important to note that in the off phase (signified by the black bars), not all symptoms returned to baseline levels. In addition, there was a significant degree of variability in the OCD symptoms during the course of the 8-week off phase. However, compared to the 8-week periods while on the micronutrients, there was no variability in obsessive symptoms. This 8-week off-phase likely reflects the natural course of OCD: in other words, the symptoms probably vary as a function of internal resources and external stressors. The fact that the symptoms did not return to baseline during the off-phase could indicate that the experience of having a prior phase that was virtually symptom-free gave SJ more internal resources to "battle" his OCD; indeed he reported having

more ability to “fight” the OCD symptoms during the off-phase compared with baseline.

Why might nutritional supplementation improve symptoms of OCD? It is possible, given the documented effects of EMP+ on mood (Kaplan et al., 2001; Kaplan, Fisher, Crawford, Field, & Kolb, 2004), that the effect was moderated through improved mood state. That is, as his depression lifted, SJ had more resources to tackle his OCD symptoms. However, as some mood symptoms persisted, it is also likely that the micronutrients positively affected neurochemical systems involved in anxiety responses, a hypothesis consistent with the dual action of anti-depressants on neural systems involved in both anxiety and depression.

Kaplan et al. (2007) speculate that some forms of mental dysfunction may be caused by in-born errors of metabolism in key neurobiological pathways, in particular those responsible for neurochemical synthesis, second messenger signaling and uptake of neurotransmitters. Indeed Ames, Elson-Schwab, and Silver (2002) suggest that genetic diseases can reduce the binding affinity of enzymes, which in turn lowers the rate of metabolic reactions. Micronutrients function as cofactors in enzymatic reactions responsible for synthesizing and metabolizing neurotransmitters. It may be that only a broad-based micronutrient formula can correct and stabilize all these functions, particularly in cases that have been resistant to other forms of treatment (Gately & Kaplan, in press). Although single ingredients contained in EMP+ have been identified as being deficient in some people with OCD (e.g., glutamine; Yucel et al., 2008) and single ingredients have been found helpful in the treatment of anxiety (e.g., inositol Fux et al., 1996; niacinamide Prousky, 2005), single nutrient approaches may not be sufficient enough to correct all imbalances; indeed, this single ingredient approach to the treatment of mental illness may be too simplistic due to the array of nutrients required for effective neurochemical synthesis (Mertz, 1994). Nutrient content of our food supply could also be considered in conjunction with these hypotheses. Data are indicating that the mineral content of food has been decreasing significantly over the last 50 years (Mayer, 1997), at least partially a result of the poor remineralization of the soil. It is possible that some individuals are also highly sensitive to these nutritional depletions present in food.

Therapist contact is unlikely to explain the dramatic change in the Y-BOCS score. The psychologist was well known to the family, having worked with SJ for over a year. It is, however, possible that the therapeutic effect of EMP+ enabled SJ to more effectively apply the CBT techniques provided to him 2 years prior to the nutritional intervention. Indeed, SJ described that when the obsessive thoughts would come, he could easily reason with them and let them go again. However, the fact that therapist contact was maintained throughout, regardless of whether the micronutrients were being taken or not, indicates that contact alone was not the main agent for symptom change.

Placebo response cannot be ruled out, but there are several reasons it is unlikely to explain the therapeutic effects. First, there was no therapeutic benefit until 2 weeks after beginning EMP+. Second, SJ himself was adamant at the start of the trial that the micronutrients would not make a difference, and indeed, he chose to come off of the treatment when he wondered whether the timing of the intervention coincided with natural recovery from his OCD. Third, the changes have been maintained now for over a 6-month period. Further, the placebo effect had essentially already been controlled in that SJ had previously received an empirically validated treatment (i.e., CBT) that did not exert the same effect on the OCD symptoms as the micronutrients. Finally, it is important to note that not all symptoms improved; at the end of treatment, the motor tics were still present to the same extent as pre-treatment, there was still some evidence of minor OCD-like symptoms (but no

longer within a clinical range), and the black and white thinking associated with Asperger's Disorder had not changed.

While CBT has shown impressive treatment responses through trials (e.g., intensive CBT has been found to have a 75% remission rate, Storch et al., 2007), this case study replicates a previous one (Kaplan et al., 2002) that highlights the impact a multi-ingredient formula can have on OCD symptoms in a highly resistant and chronic case of OCD. However, this trial does not address whether the micronutrients can “cure” OCD or whether remission of symptoms is dependent on the long-term treatment maintenance. In addition, the longest treatment phase has been 6 months, and so the long-term maximum benefit has also not been evaluated. It is also unknown whether this treatment would work with females with anxiety. CBT, when it works, is certainly a favorable choice given that long-term changes can be maintained, even after the termination of the treatment; however, for those individuals whose OCD does not respond to CBT, EMP+, or indeed other multi-ingredient approaches, remain an intriguing and yet understudied option for the treatment of mental illness. While this report investigated the effect of EMP+ on OCD symptoms, given that overall anxiety reduced, it is possible that it may be effective for the treatment of other anxiety disorders as well. More research is needed such as randomized controlled trials and studies investigating the mechanism of action of these nutrients on mental illness. Other methods of measurement would also be necessary, such as biological assays of individual nutrients or neurocognitive assessments, to better identify what other changes are occurring in conjunction with the behavioral changes.

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