Q Sciences

EMPowerplus**™** Q96 Micronutrient Product Trial Abstracts

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| 1. **Post-Earthquake Psychological Functioning in Adults with Attention-Deficit / Hyperactivity Disorder: Positive Effects of Micronutrients on Resilience** **Rucklidge J, Blampied N** New Zealand Journal of Psychology. Volume 40, No. 4, 2011: ISSN: 1179-7924

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BIPOLAR

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| 1. **Nutritional approach to bipolar disorder. Simmons M.** Journal of Clinical Psychiatry. 2003 Mar;64(3):338.

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| 1. **Treatment of mood liability and explosive rage with minerals and vitamins: two case studies in children.** **Kaplan BJ, Crawford SG, Gardner B, Farrelly G.** Journal of Child and Adolescent Psychopharmacology. 2002 Fall;12(3):205-19.

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1. **Effective mood stabilization with a chelated mineral supplement: an open-label trial in bipolar disorder.** **Kaplan BJ, Simpson JS, Ferre RC, Gorman CP, McMullen DM, Crawford SG.** Journal of Clinical Psychiatry. 2001 Dec;62(12):936-44.
2. **Multinutrient supplement as treatment: literature review and case report of a 12-year-old boy with bipolar disorder.** **Frazier EA, Fristad MA, Arnold LE.** Journal of Child and Adolescent Psychopharmacology. 2009 Aug;19(4):453-60.
3. **Database analysis of adults with bipolar disorder consuming a micronutrient formula. Gately D, Kaplan BJ.** Clinical Medicine Insights: Psychiatry. 2009 Apr;4:3-16. (2009).
4. **Feasibility of a Nutritional Supplement as Treatment for Pediatric Bipolar Spectrum Disorders** **Frazier E, Fristad M, Arnold E** The Journal of Alternative and Complementary Medicine: July 2012, 18(7): 678-685. doi:10.1089/acm.2011.0270
5. **Database analysis of children and adolescents with bipolar disorder consuming a micronutrient formula.** **Rucklidge JJ, Gately D, Kaplan BJ.** BMC Psychiatry. 2010 Sep 28;10:74.

BRAIN INJURY

1. **Diet Can Stimulate Functional Recovery and Cerebral Plasticity After Perinatal Cortical Injury in Rats. Celeste Halliwell and Bryan Kolb.** Canadian Centre for Behavioural Neuroscience, The University of Lethbridge. *Soc Neuro Abs*. 29:459-411.

ADDICTIONS

1. **Use of Micronutrients Attenuates Cannabis and Nicotine Abuse as Evidenced From a Reversal Design: A Case Study. Rachel Harrison, M.Sc.; Julia J. Rucklidge, Ph.D. & Neville Blampied, M.Sc.** *Journal of Psychoactive Drugs*, 45 (2), 168–178, 2013

OTHER

1. **Could Yeast Infections Impair Recovery From Mental Illness? A Case Study Using Micronutrients and Olive Leaf Extract for the treatment of ADHD and Depression. Julia J. Rucklidge. Ph.D** *Adv Mind Body Med.* 2013;27(3)

STRESS / ADHD

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| 1. **Can Micronutrients Improve Neurocognitive Functioning in Adults with ADHD and Severe Mood Dysregulation? A Pilot Study** **Rucklidge J, Johnstone J, Harrison R** The Journal of Alternative and Complementary Medicine. December 2011, 17(12) 2011, pp. 1125-1131
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| ABSTRACT: The September, 2010, 7.1 magnitude earthquake in Christchurch, New Zealand, provided an opportunity to study the after-effects of a major earthquake where death and injury were absent. It created a natural experiment into the protective effects on well-being of taking EMPowerplus (EMP+), a micronutrient supplement, in a group of 33 adults diagnosed with ADHD who had been assessed prior to the earthquake. Fortuitously, 16 were currently taking the supplement as part of on-going research at the time of the quake, while 17 were not (they had completed their trial of EMP+ or were waiting to begin consumption). The Depression Anxiety and Stress Scale(DASS-42) which had been administered at varying times before the earthquake on recruitment into the micronutrient study was re-administered by telephone 7-10 and again 14-18 days post-earthquake to volunteer, earthquake-exposed participants. A modified Brinley plot analysis of the individual DASS-42 scores showed that the 16 participants on the nutritional supplement were more resilient to the effects of the earthquake than the 17 individuals not taking the supplement. This effect was particularly marked for Depression scores. |

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| 1. **Post-Earthquake Psychological Functioning in Adults with Attention-Deficit / Hyperactivity Disorder: Positive Effects of Micronutrients on Resilience** **Rucklidge J, Blampied N** New Zealand Journal of Psychology. Volume 40, No. 4, 2011: ISSN: 1179-7924

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| ABSTRACT: OBJECTIVES: Little research has investigated how micronutrients (minerals and vitamins) affect cognitive functioning, despite preliminary studies showing they may improve psychiatric functioning. INTERVENTION: This pilot study investigated the impact of a 36-ingredient micronutrient formula consisting mainly of vitamins and minerals on neurocognitive functioning in 14 adults with attention-deficit/hyperactivity disorder (ADHD) and severe mood dysregulation. DESIGN: The formula was consumed in an open-label trial over an 8-week period. OUTCOME MEASURES: The participants completed tests of memory (Wide Range Assessment of Memory and Learning) and executive functioning (Delis-Kaplan Executive Functioning System and Conners Continuous Performance Test) at baseline and at the end of the trial. A gender- and age-matched control group of 14 non-ADHD adults not taking the formula were assessed on the same tests 8 weeks apart in order to investigate the impact of practice on the results. RESULTS: There were no group differences in ethnicity, socio-economic status and estimated IQ. Significant improvement was observed in the ADHD group, but not the control group, across a range of verbal abilities including verbal learning, verbal cognitive flexibility and fluency, and verbal inhibition. These neurocognitive improvements were large and consistent with improved psychiatric functioning. No changes were noted above a practice effect in visual–spatial memory and there were no improvements noted in reaction time, working memory, or rapid naming for either groups. CONCLUSIONS: Although the pilot and open-label design of the study limits the generalizability of the results, it supports a growing body of literature recognizing the importance of nutrients for mental health and cognition. The results also provide evidence supporting the need for randomized clinical trials of micronutrients as well as other experimental studies in order to better assess whether improved neurocognitive functioning may contribute to improved psychiatric symptoms |

ADD / ADHD

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| 1. **Successful Treatment of Bipolar Disorder II and ADHD with a Micronutrient Formula: A Case Study.** **Rucklidge JJ, Harrison R.** CNS Spectrums. 2010 May;15(5):289-95.

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| ABSTRACT: Bipolar disorder with co-occurring attention-deficit/hyperactivity disorder (ADHD) is a challenge to treat. Ten previous reports have shown potential benefit of a micronutrient treatment (consisting mainly of vitamins and minerals) for various psychiatric symptoms, including mood and ADHD. This case study aimed to investigate the longer term impact of the micronutrients on both psychiatric and neurocognitive functioning in an off-on-off-on (ABAB) design with 1 year follow-up. A 21-year-old female with bipolar II disorder, ADHD, social anxiety, and panic disorder entered an open-label trial using a nutritional treatment following a documented 8 year history of on-going psychiatric symptoms not well managed by medications. After 8 weeks on the formula she showed significant improvements in mood, anxiety, and hyperactivity/impulsivity. Blood test results remained normal after 8 weeks on the formula. She did not report any adverse side effects associated with the treatment. She then chose to come off the formula; after 8 weeks her depression scores returned to baseline, and anxiety and ADHD symptoms worsened. The formula was reintroduced, showing gradual improvement in all psychiatric symptoms. This case represents a naturalistic ABAB design showing on-off control of symptoms. After 1 year, the patient is now in remission from all mental illness. Neurocognitive changes mirrored behavioral changes, showing improved processing speed, consistency in response speed, and verbal memory. A placebo response and expectancy effects cannot be ruled out although previous poor response to treatment and the duration of the current positive response decrease the likelihood that other factors better explain change. These consistently positive outcomes alongside an absence of side effects indicate that further research, particularly larger and more controlled trials, is warranted using this multinutrient approach.  |
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| 1. **Effect of micronutrients on behavior and mood in adults with ADHD: evidence from an 8-week open label trial with natural extension.** **Rucklidge J, Taylor M, Whitehead K.** Journal of Attention Disorders. 2011 Jan;15(1):79-91.

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| ABSTRACT: *Objective:* To investigate the impact of a 36-ingredient micronutrient formula consisting mainly of minerals and vitamins in the treatment of adults with both Attention-deficit/hyperactivity Disorder (ADHD) and severe mood dysregulation (SMD). *Method:* 14 medication-free adults (9 men, 5 women; 18-55 years) with ADHD and SMD completed an 8-week open-label trial. *Results:* A minority reported transitory mild side effects. Significant improvements were noted across informants (self, observer, clinician) on measures of inattention and hyperactivity/impulsivity, mood, quality of life, anxiety, and stress all with medium to very large effect sizes (all ps < .01); however, the mean of inattention remained in a clinical range whereas the means on measures of mood and hyperactivity/impulsivity were normalized. Follow-up data showed maintenance of changes or further improvement for those who stayed on the micronutrients. *Conclusions:* Although this study, as an open trial, does not in itself prove efficacy, it provides preliminary evidence supporting the need for a randomized clinical trial of micronutrients as treatment for the more complex presentations of ADHD.  |

AUTISM

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| 1. **Micronutrients versus standard medication management in autism: a naturalistic case-control study.** **Mehl-Madrona L, Leung B, Kennedy C, Paul S, Kaplan BJ.** Journal of Child and Adolescent Psychopharmacology. 2010 Apr;20(2):95-103.

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| ABSTRACT: Autism spectrum disorder (ASD) is often accompanied by self-injurious behavior (SIB), aggression, and tantrums, symptoms that have reportedly improved with micronutrient (vitamins and minerals) treatment. The current study took advantage of naturally occurring differences in parental preferences for treatment approaches. The micronutrient group asked for treatment without pharmaceuticals (n=44, aged 2–28 years at entry [M=8.39+5.58]). Their records were matched with those of 44 similar children whose families requested conventional treatment (medication group). Both groups improved on both the Childhood Autism Rating Scale and the Childhood Psychiatric Rating Scale (all p values <0.0001). Both groups also exhibited significant decreases in total Aberrant Behavior Checklist scores, but the micronutrient group’s improvement was significantly greater (p<0.0001). SIB Intensity was lower in the micronutrient group at the end of the study (p=0.005), and improvement on the Clinical Global Impressions scale was greater for the micronutrient group (p=0.0029). It is difficult to determine whether the observed changes were exerted through improvement in mood disorder or through an independent effect on autistic disorder. There were some advantages to treatment with micronutrients—lower activity level, less social withdrawal, less anger, better spontaneity with the examiner, less irritability, lower intensity SIB, markedly fewer adverse events, and less weight gain. Advantages of medication management were insurance coverage, fewer pills, and less frequent dosing. |

OBSESSIVE COMPULSIVE DISORDER

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| 1. **Successful treatment of OCD with a micronutrient formula following partial response to Cognitive Behavioral Therapy (CBT): a case study.** **Rucklidge JJ.** Journal of Anxiety Disorders. 2009 Aug;23(6):836-40.

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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.  |

MOOD AND BEHAVIOR PROBLEMS

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| 1. **Improved mood and behavior during treatment with a mineral-vitamin supplement: an open-label case series of children.** **Kaplan BJ, Fisher JE, Crawford SG, Field CJ, Kolb B.** Journal of Child and Adolescent Psychopharmacology. 2004 Spring;14(1):115-22.

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| ABSTRACT: A group of scientists from three Alberta universities and the Alberta Children’s Hospital published the results of 11 unselected children with mood and behavior problems. The diagnoses of the children included attention deficit hyperactivity disorder (ADHD), bipolar disorder, oppositional defiant disorder (ODD), obsessive-compulsive disorder (OCD), Asperger syndrome, generalized anxiety disorder (GAD), Prader-Willi Syndrome depression, anxiety, and rage. The children were assessed for a minimum of 8 weeks on an adult dose of EMPowerplus, which was well-tolerated. Outcomes were measured with the Young Mania Rating Scale (YMRS), the Youth Outcome Questionnaire (YOQ), and the Child Behavior Checklist (CBCL). Results: For all 9 children who completed the trial, the micronutrient treatment was clinically beneficial, and all effect sizes were large (>.8). Improvement was significant on the YOQ (measuring children’s mood, physical symptoms, self-harm behavior, interpersonal relationship problems, social problems, and attention problems), the YMRS (measuring symptoms such as irritability and disruptive aggressive behaviors), and 7 of the 8 CBCL scales (withdrawn behavior, anxious/depressed mood, social problems, thought problems, attention problems, delinquent behavior, and aggressive behavior).  |
| **PSYCHOSIS**1. **Efficacy and cost of micronutrient treatment of childhood psychosis. Rodway M, Vance A, Watters A, Lee H, Bos E, Kaplan BJ** BMJ Case Rep. 2012 Nov 9;2012. pii: bcr2012007213. doi: 10.1136/bcr-2012-007213.
 |
| ABSTRACT: Psychosis is difficult to treat effectively with conventional pharmaceuticals, many of which have adverse long-term health consequences. In contrast, there are promising reports from several research groups of micronutrient treatment (vitamins, minerals, amino acids and essential fatty acids) of mood, anxiety and psychosis symptoms using a complex formula that appears to be safe and tolerable. We review previous studies using this formula to treat mental symptoms, and present an 11-year-old boy with a 3-year history of mental illness whose parents chose to transition him from medication to micronutrients. Symptom severity was monitored in three clusters: anxiety, obsessive compulsive disorder and psychosis. Complete remission of psychosis occurred, and severity of anxiety and obsessional symptoms decreased significantly (p<0.001); the improvements are sustained at 4-year follow-up. A cost comparison revealed that micronutrient treatment was <1% of his inpatient mental healthcare. Additional research on broad-spectrum micronutrient treatment is warranted |
| **BIPOLAR**

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| 1. **Nutritional approach to bipolar disorder. Simmons M.** Journal of Clinical Psychiatry. 2003 Mar;64(3):338.

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| ABSTRACT: In a letter to the editor of the *Journal of Clinical Psychiatry*, Dr. Miles Simmons, a psychiatrist in private practice in Brunswick, Maine, reported his clinical experience with EMPowerplus. Impressed by the striking response of one of his patients to EMPowerplus, Dr. Simmons carefully monitored treatment-resistant patients from his private practice who were willing to try this nutritional approach. Results: Of 19 patients that met the DSM-IV criteria for bipolar disorder (14 bipolar I and 5 bipolar II), Dr. Simmons observed that “12 of the 19 patients showed marked clinical improvement, 3 showed moderate improvement, and 1 showed mild improvement” (84% positive response rate). Of 16 medicated patients (who were taking 2.7 psychiatric medications on average) 13 were able to completely discontinue their psychiatric medications (over an average of 5.2 weeks) had remained stable on EMPowerplus alone for an average of 13 months.

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| 1. **Treatment of mood liability and explosive rage with minerals and vitamins: two case studies in children.** **Kaplan BJ, Crawford SG, Gardner B, Farrelly G.** Journal of Child and Adolescent Psychopharmacology. 2002 Fall;12(3):205-19.

  |
| ABSTRACT: A group of scientists at the University of Calgary and the Alberta Children’s Hospital reported the effects of EMPowerplus on 2 medication-free boys with explosive rage and mood disorders (atypical obsessive-compulsive disorder and pervasive developmental delay), using an ABAB (off-on-off-on) study design. Results: In both cases, symptoms increased when the micronutrient supplement was withdrawn and improved when the supplement was introduced. When taking the supplement, the boys had fewer emotional outbursts, fewer anxious and obsessional thoughts, more positive mood, and better temper control. Improvements were noted on the Conners Parent Rating Scale (CPRS) mood and temper symptoms, Children’s Version Yale-Brown Obsessive-Compulsive Scale (CY-BOCS) obsessive-compulsive symptoms, and Child Behavior Checklist (CBCL) symptoms of aggressive, delinquent, and anxious/depressed behavior, as well as social and attention problems. Neither boy experienced any adverse effects from taking an adult dose of the nutritional supplement. At the time of publication, both boys had been stable on the nutritional supplement for over 2 years.

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| 1. **Do vitamins or minerals (apart from lithium) have mood-stabilizing effects?** **Popper CW.** Journal of Clinical Psychiatry. 2001 Dec;62(12):933-5.

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| ABSTRACT: Dr. Charles Popper, psychopharmacologist and psychiatrist at Harvard University’s McLean Hospital, published a commentary on the Kaplan et al. (2001) paper, in which he reported the results of his clinical experience with EMPowerplus. Results: Of 22 patients (10 adults, 9 adolescents, 3 pre-adolescents) who clinically met criteria for bipolar disorder, 19 (86%) showed a positive response to the micronutrient treatment. Of 15 patients taking medications, 11 (73%) were able to gradually withdraw from their medications, and were stable taking the micronutrient treatment alone.  |

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| 1. **Effective mood stabilization with a chelated mineral supplement: an open-label trial in bipolar disorder.** **Kaplan BJ, Simpson JS, Ferre RC, Gorman CP, McMullen DM, Crawford SG.** Journal of Clinical Psychiatry. 2001 Dec;62(12):936-44.

  |
| ABSTRACT: A group of scientists at the University of Calgary and the Alberta Children’s Hospital conducted a study to determine the therapeutic benefit of EMPowerplus™ on 14 unselected adult bipolar patients who had taken psychotropic medications for an average of 6.7 years. Patients were assessed by their own psychiatrists with the Hamilton Rating Scale for Depression (HAM-D), the Brief Psychiatric Rating Scale (BPRS), and the Young Mania Rating Scale (YMRS). Results: For the 11 patients who completed the minimum 6-month open trial, average symptom reduction was 55% on the HAM-D, 60% on the BPRS, and 66% on the YMRS. The effect size for the intervention was large (>.8) for each measure. The number of psychotropic medications decreased significantly from an average of 2.7 to 1.0. In some cases, the micronutrient treatment replaced psychotropic medications and the patients remained stable. The only reported side effect (i.e., nausea) was infrequent, minor, and transitory.  |

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| 1. **Multinutrient supplement as treatment: literature review and case report of a 12-year-old boy with bipolar disorder.** **Frazier EA, Fristad MA, Arnold LE.** Journal of Child and Adolescent Psychopharmacology. 2009 Aug;19(4):453-60.

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| ABSTRACT: Early-onset bipolar disorder has significant morbidity and mortality. Development of safe, effective treatments to which patients will adhere is critical. Pharmacologic interventions for childhood bipolar spectrum disorders are limited and are associated with significant risk for adverse events (Kowatch et al 2005). Diet and nutrition research suggests vitamins, minerals, and other nutrients are important underpinnings of general physical and mental health; further, they may even be useful in treating mood dysregulation by providing a more favorable risk-benefit ratio than contemporary psychotropic agents (Kaplan, Crawford, Field, & Simpson 2007). This article reviews the literature on multinutrient supplementation and mental health, and examines a case study of a 12-year-old boy with bipolar disorder and comorbid diagnoses treated for 6 years with conventional medication and finally a multinutrient supplement.The multinutrient supplement in this case study is EMPowerplus (EMP+), a 36-ingredient supplement containing sixteen minerals, fourteen vitamins, three amino acids and three antioxidants. It was used to treat a 12-year-old boy initially diagnosed with bipolar disorder-not otherwise specified (BP-NOS) at age 6, whose diagnosis evolved by age 10 to bipolar I (BP-I), mixed, with psychotic features. He also met criteria for generalized anxiety disorder by age 8 and obsessive-compulsive disorder by age 10. After six years of conventional treatment (ages 6-12), he received fourteen months of EMP+. Symptom manifestation over seven years is described in conjunction with treatment history. EMP+ resulted in superior outcome to conventional treatment. This report adds to accumulating preliminary evidence that further basic science and clinical studies of multinutrient supplements are warranted.  |
| 1. **Database analysis of adults with bipolar disorder consuming a micronutrient formula. Gately D, Kaplan BJ.** Clinical Medicine Insights: Psychiatry. 2009 Apr;4:3-16. (2009).

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| ABSTRACT: Key Findings* In a large sample of 358 adults with bipolar disorder, the effect size was large at 6 months (0.76, p < 0.001).
* For over half the sample, symptom improvement exceeded 50% at 3 and 6 months.
* One-third of the sample experienced very significant symptom reduction that exceeded 75%.
* The strongest predictors of improved mental health were (a) increasing micronutrient dose and (b) decreasing psychiatric medications.

Study Aims Because of the incomplete benefit from pharmaceuticals and from single nutrient interventions in treating mood symptoms, and the more promising results from multinutrient formulas, the authors investigated the long term benefits of a broad-based micronutrient formula.Data Source The data was obtained from individuals who purchased a micronutrient formula and provide self reported symptom data to the product developers. The database used was anonymous, using assigned identifier numbers. The sample consisted of 682 adults who reported being diagnosed with bipolar disorder. Within that group, 358 individuals reported the single diagnosis of bipolar disorder and provided symptom data for at least 6 months worth of analysis. Neither author was involved in any way with the data collection and could not bias the data in any way.Results: The analysis showed that not only was the use of the micronutrient formula linked to the outcome but the amount of formula taken (measured in capsules) was directly proportional to the outcome.Individuals taking medications also experienced significant decreases in symptoms; however, the group with the higher medication index had the more moderate response, and while maintaining the improvement, did not improve like the other groups did.The fact that symptom improvements were sustained or even increased at 6 months strongly suggests that the benefit cannot be attributed to a placebo effect. Selecting for the single disorder makes the participants, and results, comparable to those who are in typical pharmaceutical trials. People searching for nutritional methods to manage their mood symptoms are likely to have had ineffective experience with medications, and perhaps be considered treatment resistant. While not representative of everyone with bipolar disorder it is possible that they are more difficult to treat, lending more weight to the clinical implications of these findings. With the emergent evidence of the modest effect of pharmaceuticals and the growing evidence for the improving of mood symptoms using multinutrient formulas, this evidence provides a powerful case for further research with this type of intervention. This brings to 6 the number of published articles demonstrating reproducibility and efficacy of the Truehope multinutrient formula. |

1. **Feasibility of a Nutritional Supplement as Treatment for Pediatric Bipolar Spectrum Disorders** **Frazier E, Fristad M, Arnold E** The Journal of Alternative and Complementary Medicine: July 2012, 18(7): 678-685. doi:10.1089/acm.2011.0270
 |
| ABSTRACT: OBJECTIVES: Current psychotropic medications for childhood bipolar spectrum disorders (BPSD) are associated with significant adverse events. As nutrients play an important role in physical and mental health, they may be useful in treating mood disorders with few side-effects. This open-label study explored the feasibility of testing therapeutic effects of a multinutrient supplement, EMPowerplus™ (EMP+), for pediatric BPSD. DESIGN: EMP+ was started at one capsule t.i.d. and escalated to a goal of four capsules t.i.d., which eight children attained. Four (4) of these increased to the maximum dose, five capsules t.i.d. Mood symptoms were assessed seven times over 8 weeks. SUBJECTS: Ten (10) children, age 6–12 with BPSD, were enrolled in 6.5 months. Seven (7) participants completed the full trial. Three (3) dropped out due to palatability and/or adherence issues. RESULTS: Mean medication adherence was 91%. With one-tailed nonparametric Fisher's randomization tests, intent-to-treat analyses demonstrated a 37% decrease in depression scores (p<0.06) and a 45% decrease in mania scores (p<0.01) from the start of treatment through final visit, suggesting improvement and possible treatment response. Study completers demonstrated significant decreasing trends in both depression and mania scores from baseline to final visit (p<0.05). Side-effects were minor and transient, mostly temporary gastric discomfort. CONCLUSIONS: Future randomized, placebo-controlled trials of EMP+ are warranted and feasible.  |

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| 1. **Database analysis of children and adolescents with bipolar disorder consuming a micronutrient formula.** **Rucklidge JJ, Gately D, Kaplan BJ.** BMC Psychiatry. 2010 Sep 28;10:74.

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| ABSTRACT: BACKGROUND: Eleven previous reports have shown potential benefit of a 36-ingredient micronutrient formula (known as EMPowerplus™) for the treatment of psychiatric symptoms. The current study asked whether children (7-18 years) with pediatric bipolar disorder (PBD) benefited from this same micronutrient formula; the impact of Attention-Deficit/Hyperactivity Disorder (ADHD) on their response was also evaluated. METHODS: Data were available from an existing database for 120 children whose parents reported a diagnosis of PBD; 79% were taking psychiatric medications that are used to treat mood disorders; 24% were also reported as ADHD. Using Last Observation Carried Forward (LOCF), data were analyzed from 3 to 6 months of micronutrient use. RESULTS: At LOCF, mean symptom severity of bipolar symptoms was 46% lower than baseline (effect size (ES) = 0.78) (p < 0.001). In terms of responder status, 46% experienced >50% improvement at LOCF, with 38% still taking psychiatric medication (52% drop from baseline) but at much lower levels (74% reduction in number of medications being used from baseline). The results were similar for those with both ADHD and PBD: a 43% decline in PBD symptoms (ES = 0.72) and 40% in ADHD symptoms (ES = 0.62). An alternative sample of children with just ADHD symptoms (n = 41) showed a 47% reduction in symptoms from baseline to LOCF (ES = 1.04). The duration of reductions in symptom severity suggests that benefits were not attributable to placebo/expectancy effects. Similar findings were found for younger and older children and for both sexes. CONCLUSIONS: The data are limited by the open label nature of the study, the lack of a control group, and the inherent self-selection bias. While these data cannot establish efficacy, the results are consistent with a growing body of research suggesting that micronutrients appear to have therapeutic benefit for children with PBD with or without ADHD in the absence of significant side effects and may allow for a reduction in psychiatric medications while improving symptoms. The consistent reporting of positive changes across multiple sites and countries are substantial enough to warrant a call for randomized clinical trials using micronutrients.  |

**BRAIN INJURY**

1. **Diet Can Stimulate Functional Recovery and Cerebral Plasticity After Perinatal Cortical Injury in Rats. Celeste Halliwell and Bryan Kolb.** Canadian Centre for Behavioural Neuroscience, The University of Lethbridge. *Soc Neuro Abs*. 29:459-411.

ABSTRACT

 Early cortical injury has been attributed to the consequential effects of various factors, such as alcohol, drug addiction, smoking, and inadequate nutrient intakes during periods of pregnancy and lactation, or delivery of infants by forceps, and premature deliveries. These are only a few examples of circumstances, or "injury", that may result in disorders ranging from mild learning difficulties to aggressive behavior. Injury to the cortex during the early years of development has been known to result in poor behavioral outcome into adulthood. Presently, the most common



form of treatment includes a pharmacological agent, which may be accompanied with behavioral modification therapies supported by families. As an alternative form of therapy towards the treatment of early cortical injury, choline and a vitamin and mineral supplement (EM Power+) were used to determine the possibilities of nutrition intervention in an animal model. The injuries were incurred by aspiration lesion at days three, (Exp. l) and four, (Exp.2) and lesions were localized to the midline medial frontal cortex in some rats, while a different group of rats received lesions in the posterior parietal cortex. The pre and postnatal choline treated animals showed favorable results for the medial frontal lesions, and the postnatal vitamin supplement treated animals showed favorable results for treatment in both medial frontal and posterior parietal lesions. All animals were tested in adulthood indicating that nutrition intervention is very beneficial for alleviating some of the functional deficits commonly seen from early cortical injury.

METHOD: From a total of 103 animals thirty-eight two to four day old rats received frontal lesions, or the removal of the frontal lobes of their brain. Twenty three of this group were supplemented with EMPowerplus. Twenty-four two to four day old rats received posterior parietal lesions or removal of the parietal region of the brain. Fourteen of this group were supplemented with EMPowerplus. Both the control and supplemented rats underwent testing for performance in behavioral and skill challenges.

RESULTS: Behavioral Findings:

* The supplement completely reversed the cognitive spatial deficit and partially reversed  the motor deficits in the medial frontal lesion animals, and reduced the cognitive deficits  in the posterior parietal lesion animals.
* Control rats on the other hand experienced continued severe cognitive spatial deficits  from the frontal lesions and posterior parietal lesion controls showed no recovery.
* In the Morris Tank Test “The Rats with frontal lesions were impaired at the task, and this  impairment was reversed with the supplement treatment, suggesting a complete recovery  of function.”
* The investigators have never seen any other treatment that facilitated recovery from  posterior parietal lesions.

Anatomical Findings:

* “The supplement treatment significantly increased cortical thickness in both the lesion and control animals”
* “Animals that received the supplement... had larger nuclear areas and many more cells than in the no treatment group.”

**ADDICTIONS**

1. **Use of Micronutrients Attenuates Cannabis and Nicotine Abuse as Evidenced From a Reversal Design: A Case Study. Rachel Harrison, M.Sc.; Julia J. Rucklidge, Ph.D. & Neville Blampied, M.Sc.** *Journal of Psychoactive Drugs*, 45 (2), 168–178, 2013

**Abstract**

Prior research shows that micronutrients, particularly amino acids, can assist individuals with substance dependence to quit various drugs of abuse, including cannabis, alcohol, and cocaine. As part of a wider investigation of the impact of micronutrients (mostly vitamins and minerals) on psychi- atric symptoms, such as Attention-Deficit/Hyperactivity Disorder (ADHD), depression, and anxiety, we observed that many participants reduced or eliminated use of alcohol, cigarettes, and cannabis. One case using a single-case reversal (off-on-off-on-off) design is presented and shows not only on-off control of psychiatric symptoms as micronutrients are consumed or withdrawn, but also simultaneous on-off use of cannabis and cigarettes, despite not directly targeting this substance use as part of the treatment protocol.

This case adds to a growing body of research supporting the use of micronutrients in the treat- ment of psychiatric symptoms and suggests it may extend to substance dependence. Micronutrients, by assisting with mood regulation and reductions in anxiety, may assist with successful cessation of drug use. Alternatively, they may directly impact on the brain reward circuitry believed to be involved in the expression of addictions, thereby providing the appropriate precursors and cofactors necessary for adequate neurotransmitter synthesis. This case should continue to stimulate researchers to consider the role of nutrients, in particular vitamins and minerals, in drug treatment programs and encourage more rigorous trials.

**Method**

Brian (not his real name), a 20-year-old male of European descent, in a stable relationship for one year, completed a standardized assessment of his psychiatric functioning in February 2010 using The Structured Clinical Interview for DSM-IV-TR Axis I Disorders, Research Version (SCID-I; (First et al. 1997) and the Conners’ Adult ADHD Diagnostic Interview for DSM-IV (CAADID; Epstein, Johnson & Conners 2002). He was then fol- lowed through to May 2011. Brian met DSM-IV criteria for ADHD Combined Type, Major Depressive Disorder, Panic Disorder with Agoraphobia and Substance Abuse (cannabis). He used cigarettes and cannabis on a daily basis and despite having tried to reduce, had been using these drugs for several years. In the past, Brian had been on various medications for his psychiatric symptoms, including methylphenidate, imipramine, fluoxetine, clonidine, amitriptyline, lorazepam, and clonazepam. He remarked that none of the medications had directly reduced his symptoms without him experiencing significant side-effects. At the time of the assessment and throughout the trial, Brian did not take any psychotropic medications.

**Discussion**

Brian is a 20-year-old male who presented with severe mood dysregulation, ADHD, Panic Disorder with Agoraphobia, and cannabis abuse. He responded to a micronutrient treatment with improvements in all his psychiatric symptoms including depression, ADHD, and anxiety. His positive response to treatment was replicated through a reversal design, demonstrating on-off control of symptoms when micronutrients were consumed and then withdrawn. The detection of these treatment-related changes is aided by the stable baseline observed over a one-month period. Of particular interest, both Brian’s nicotine and cannabis use reportedly decreased while on the micronutrients and increased again while off, although an obvious lag did occur in that the mood and ADHD symptoms resolved first, followed a few weeks later with a reduction in substance use. It is relevant that on the final follow-up Brian obtained a low mood score and concurrently reported low cannabis use. This clear relationship that emerged between depression and cannabis use supports other research suggesting that cannabis can be used to self-medicate for depression (Grant & Pickering 1998).

Therapist contact is unlikely to explain the dramatic changes in Brian’s symptoms, as therapist contact was gradually tapered off over time and contact was minimal (once a month) in the second reinstatement phase. Further, therapist contact occurred even when Brian was not taking the micronutrients. Perhaps more remarkably, Brian achieved these changes after a long and well-documented history of poor response to conventional treatments; one intervention (micronutrients) stabilized ADHD and mood symptoms as well as anxiety.

**OTHER**

1. **Could Yeast Infections Impair Recovery From Mental Illness? A Case Study Using Micronutrients and Olive Leaf Extract for the treatment of ADHD and Depression. Julia J. Rucklidge. Ph.D** *Adv Mind Body Med.* 2013;27(3)

**Abstract**

Micronutrients are increasingly used to treat psychiatric disorders including attention-deficit/hyperactivity disorder (ADHD), mood disorders, stress, and anxiety. However, a number of factors influence optimal response and absorption of nutrients, including the health of the gut, particularly the presence of yeast infections, such as *Candida.* As part of a wider investigation into the impact of micronutrients on psychiatric symptoms, many participants who experienced a yeast infection during their treatment showed a diminished response to the micronutrients. One case was followed systematically over a period of 3 years with documentation of deterioration in psychiatric symptoms (ADHD and mood) when infected with *Candida* and then symptom improvement following successful treatment of the infection with olive leaf extract (OLE) and probiotics. This case outlines that micronutrient treatment might be severely compromised by infections such as *Candida* and may highlight the importance of gut health when treating psychiatric disorders with nutrients. Given the role that inflammation can play in absorption of nutrients, it was hypothesized that the infection was impairing absorption of the micronutrients. (*Adv Mind Body Med.* 2013;27(3):##-##.)

**Discussion**

Kate is a 24-year-old female who presented with severe mood dysregulation and combined-type ADHD. She responded to a micronutrient treatment, with improvements in all her psychiatric symptoms, including depression and ADHD. These treatment gains were then maintained for over 2 years. At that point, Kate’s psychiatric symptoms worsened at the same time that she developed symptoms consistent with *Candida*. Treatment of her intestinal as well as her vaginal *Candida*, together with continued treatment with micronutrients, also resulted in improvement in Kate’s psychiatric status. This case illustrates the importance of considering the role that infections may play in the expression of psychiatric symptoms.

Given the role that gut inflammation can play in absorption of nutrients, the author hypothesized that a gastrointestinal infection was impairing the absorption of the micronutrients. While Kate was diagnosed with a vaginal infection, her symptoms of itch in both her vagina and anus suggested that she might also have an infection in her gastrointestinal tract, a common place for the infection to reside in addition to the vagina. These symptoms indicated that a culture assessment of the infection through fecal testing would be required to confirm the author’s hypothesis. Indeed, medical practitioners and researchers do not know how often gastro- intestinal infections with *Candida* accompany vaginal infections with *Candida*. A growing body of literature that discusses the gut-brain axis shows that the gut microbiota can influence brain function and subsequent psychiatric functioning. The author’s case may illustrate this gut-brain communication at play, whereby improved microbiota led to reduced inflammation, perhaps resulting in improved nutrient absorption, leading to improved psychiatric symptoms. Although speculative, it is a hypothesis worthy of considering and further testing empirically.