

## Correspondence

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- Do micronutrients help in ADHD?

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I read with interest the paper by Rucklidge *et al* on the preliminary evidence of efficacy of micronutrients in attention-deficit hyperactivity disorder.<sup>1</sup> I would like to comment on those results.

- 1 The findings are rather controversial since only two measurements (self- and observer ratings) showed some difference, whereas a third one (clinician rating) did not.
- 2 It is not clear from this or other papers celebrating the wonders of nutrients which of those ingredients is effective (and which is not) or why that particular combination was chosen.
- 3 I am not sure that I would recommend a combination of 36 micronutrients at doses up to ten times higher than the daily allowed for undefined periods of times. Are there studies on the long-term consequences of at least one of them?
- 4 A quick verification of the cost of EMPowerplus (the nutrient combination advertised by the paper) is about US\$70 for 30 days. Of course, this is not reimbursed by the National Health Service.
- 5 Since the paper acknowledges the above-mentioned programme which is sold online, it is hard to believe that the authors have no conflict of interest as claimed in the Declaration of Interest.

- 1 Rucklidge JJ, Frampton CM, Gorman B, Boggis A. Vitamin-mineral treatment of attention-deficit hyperactivity disorder in adults: double-blind randomised placebo-controlled trial. *Br J Psychiatry* 2014; **204**: 306–15.

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**Authors' reply:** First, describing our results as 'controversial' because 100% congruence across measures was not documented applies an unusual standard to our research. It is not surprising that self- and observer ratings would be more sensitive to change than the less frequent observations of the clinician. Also, Tondo overlooked the fact that the clinician rating that takes into account the individual's global functioning (the Clinical Global Impression scale) did show significant group differences.

Second, Tondo's logic is faulty when he asks which ingredient is effective. The search for a single magic ingredient is simply the wrong approach and has yielded only modest clinical effects<sup>1</sup> as it ignores the well-established fact that nutrients work synergistically for optimal metabolic function.

Third, Tondo displays a lack of familiarity with the Dietary Reference Intakes (DRIs) when he asserts that the ingredients in this formula are up to ten times the 'allowed' amounts. The recommended daily allowances, to which he is likely referring, are relevant if one's goal is to avoid frank deficiency syndromes (like scurvy) in an otherwise healthy population. Our research is not on otherwise healthy people (by definition their brains are not functioning optimally), and so the important DRI metric is the tolerable upper level. The upper levels represent the amount that can be consumed chronically with no toxic effects. The ingredients of the formulas we study are generally below the upper levels except in a few cases in which they are properly balanced. Although we can agree that longer-term safety data are always needed, we and others have reported an overall lack of adverse effects using broad-spectrum micronutrients for up to about 8 years.<sup>2–5</sup>

Fourth, cost is a problem, which we will comment on even though the commercial aspects of nutrient formulas are not our concern. To us, Tondo's comment suggests that we need replication, and if evidence of efficacy continues to accrue, then the National Health Service would need to find ways of funding it. And it may be in their best interests to do so: the one study published thus far that included costing information demonstrated that broad-spectrum micronutrient treatment (which resolved the symptoms) cost <2% of conventional in-patient care (which was not therapeutically helpful).<sup>5</sup> But there is insufficient basis for government funding until we have further evidence of efficacy.

Finally, none of the investigators has any conflict of interest. The fact that Tondo finds this hard to believe demonstrates the extent to which conventional psychiatric research has been corrupted by financial ties to industry. The companies making EMPowerplus and its variants provide the micronutrients with a matching placebo at no cost to any researcher with an ethically approved study. The company did not pay for the running of the trial: all funds came from independent sources. The company did not engage in dialogues about design, interpretation or analysis, nor were they involved in any stage of the publication. We are therefore deeply concerned that Tondo asserts that we do hold some type of conflict of interest.

- 1 Rucklidge JJ, Johnstone J, Kaplan BJ. Magic bullet thinking – why do we continue to perpetuate this fallacy? (letter). *Br J Psychiatry* 2013; **203**: 154.
- 2 Rucklidge JJ, Frampton CM, Gorman B, Boggis A. Vitamin-mineral treatment of ADHD in adults: a 1-year naturalistic follow-up of a randomized controlled trial. *J Atten Disord* 2014; 7 May (epub ahead of print).
- 3 Simpson JSA, Crawford SG, Goldstein ET, Field C, Burgess E, Kaplan BJ. Systematic review of safety and tolerability of a complex micronutrient formula used in mental health. *BMC Psychiatry* 2011; **11**: 62.
- 4 Popper CW. Single-micronutrient and broad-spectrum micronutrient approaches for treating mood disorders in youth and adults. *Child Adolesc Psychiatr Clin N Am* 2014; **23**: 591–672.
- 5 Rodway M, Vance A, Watters A, Lee H, Bos E, Kaplan BJ. Efficacy and cost of micronutrient treatment of childhood psychosis. *BMJ Case Rep* 2012; doi: 10.1136/bcr-2012-007213.

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