

# January Study of the Month

## The Effect of Vitamin D and Magnesium Supplementation on the Mental Health Status of Attention-Deficit Hyperactive Children: A Randomized Controlled Trial

### Summary by Adrienne Elgie, Intern at CCNM

**Introduction:** 5-7% of children worldwide have Attention Deficit Hyperactivity Disorder (ADHD) with some of the symptoms continuing into adulthood. Although medications and counselling play a large role in treating ADHD, many people seek natural therapies to alleviate the side effects of medication or to help with the lack of success of pharmaceuticals and symptom severity. Previous studies show the correlation of ADHD with deficient vitamin D and magnesium levels, most likely due to their role as cofactors in the nervous system and in the brain, affecting mental health. The authors in this study aimed to assess the effects of co-supplementation of vitamin D and magnesium on mental health status in children with ADHD.

**Study Design:** 8-week double blind, randomized controlled trial (RCT)

**Population:** 66 children (20 girls, 46 boys) between 6-12 years old with a diagnosis of ADHD completed the study. ADHD was diagnosed based on meeting 6 of 9 inattention criteria and 6 of 9 hyperactivity criteria-both based on *DSM IV* criteria. The children also had to have vitamin D levels of under 30ng/dL and serum magnesium less than 2.3mg/dL.

**Intervention:** Children were instructed to take one pearl containing 50,000 IU vitamin D along with one oral tablet of magnesium (6 mg/kg body weight) with lunch once per week for 8 weeks. The control group received a placebo that looked and tasted like the pearls in the intervention group.

**Outcome Measures:** Serum levels 25-OH-vitamin D and magnesium. Strength and Difficulties Questionnaire (SDQ)- A 25 question assessment of mental health status.

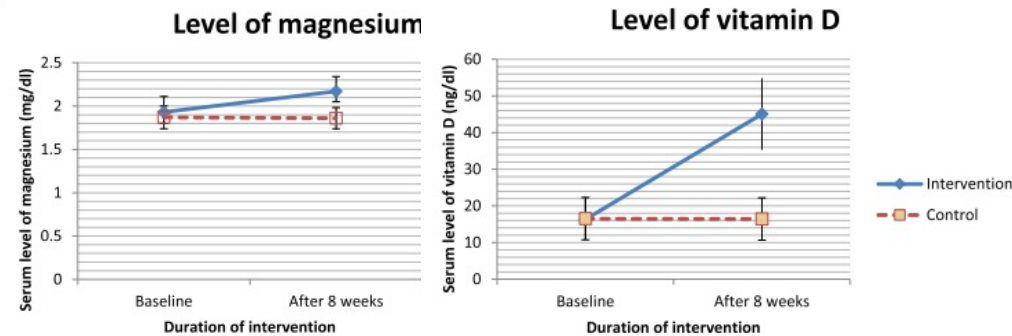


Figure 1. Serum magnesium levels at baseline and after trial.

Figure 2. Serum Vitamin D levels at baseline and after trial.

**Results:** Baseline levels of magnesium and vitamin D were assessed, and were found to be the same between both the intervention group and control group.

The intervention group experienced an increase in serum magnesium and vitamin D levels, alongside decreased emotional and peer problems, decreased total difficulties, and decreased internalizing scores. There was no significant difference in hyperactivity scores between the two groups. There were no side effects from the supplements.

**Discussion:** This study shows that supplementing with both vitamin D and magnesium may play a role in the mental health status of children with ADHD with low serum levels, which may improve quality of life. This study is one of very few that assess both magnesium & vitamin D supplementation on children with ADHD, but its findings are in line with prior research demonstrating a correlation between low vitamin D and magnesium status on children with ADHD. Limitations of this study include a small sample size of only 66 children, so a larger study is warranted.

If we were to supplement either vitamin D or magnesium without the other, would we see the same results? Would supplementing vitamin D and magnesium in children without low serum levels of either provide any benefit?

### Reference:

Hemamy, M., Pahlavani, N., Amanollahi, A., Islam, S. M. S., McVicar, J., Askari, G., & Malekhamadi, M. (2021). *The effect of vitamin D and magnesium supplementation on the mental health status of attention-deficit hyperactive children: a randomized controlled trial.* *BMC Pediatrics*, 21(1). doi:10.1186/s12887-021-02631-1

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