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Fish oil and impulsive aggressive behaviour

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Abstract
Letter to the Editor.

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Editor-in-Chief
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Harold S. Koplewicz, MD
President

Dear Dr Koplewicz,

Fish Oil and Impulsive Aggressive Behaviour

Re: Dean AJ, Bor W, Adam K, Bowling FG, Bellgrove MA. A randomized, controlled, crossover trial of fish oil treatment for impulsive aggression in children and adolescents with disruptive behaviour disorders. Journal of Child and Adolescent Psychopharmacology 2014;24(3):140-148.

It is not surprising to see a negative outcome from this study for several reasons. Firstly, the 6 week length of the intervention was not long enough to see any effect and especially a cross-over design where there would be a carry-over effect from the fish oil. Secondly, compliance is questionable as the 400mg EPA plus 2000mg DHA dose resulted in a significant increase of serum EPA (by approximately 5 fold) but no significant increase in DHA, yet the dose of DHA was 5 fold higher than that of EPA. Thirdly, "15 participants provided at least one blood sample during the study (13 at baseline, 8 at 6 weeks, and 2 at 12 weeks)". The authors correctly pointed out in the limitation section that the number of participants with serum concentration data were too small to examine how the change in serum concentrations of fatty acids influenced behaviour. Despite these major limitations the authors still concluded that fish oil is not an effective treatment for aggression.

An important point raised previously by statisticians and authors Bloch and Qawasmi relate to the design of dietary supplement intervention trials in children with disruptive behavioural disorders including Attention Deficit Hyperactivity Disorder (ADHD) and the relevance of adequate power and sample size. Bloch and Qawasmi [1] calculated that, in order to have sufficient power ($\beta = 80\%$, 2-tailed $\alpha = 0.05$) to detect a significant benefit (effect size of 0.31), clinical trials of omega-3 intervention compared to a placebo would need a sample size of approximately 330 children. Therefore, the actual sample size in this study ($n = 21$) demonstrate insufficient statistical power which notably contributes to the null finding [1].

When designing randomised controlled trials, the study design should include an intervention long enough to see an effect, and to be able to show that the change in intervention (e.g. aggressive behaviour) is related to the change in the biomarker. Furthermore, there is a significant wash-out period for DHA levels once accumulated in brain tissue; therefore a crossover design such as this with fish oil supplementation is inappropriate. Outcome measures should also be considered – this study used a questionnaire to assess aggression. Although the authors refer to Gesch et al [2], they do not mention that both Gesch et al [2] and Zaalberg et al [3] found substantially reduced aggressive behaviour in prisoners after omega-3 plus multivitamin mineral supplementation, as assessed by the reduced number and severity of reprimands, but not as assessed with self-report questionnaires that assessed aggressive behavior.

Given these methodological issues the authors' conclusion is flawed. It is disappointing to see studies like this that have not sufficiently researched previous study methodologies and outcomes. Readers should refer to a recent update of the current evidence and future directions [4].

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The authors declare no conflict of interest and do not have anything to disclose in the past 36 months.

References

[1] Bloch MH, Qawasmi A: Omega-3 Fatty Acid supplementation for the treatment of children with attention-deficit/hyperactivity disorder symptomatology: systematic review and meta-analysis, J Am Acad Child Adolesc Psychiatry. 50:991-1000, 2011.

[2] Gesch CB, Hammond SM, Hampson SE, Eves A, Crowder MJ: Influence of supplementary vitamins, minerals and essential fatty acids on the antisocial behaviour of young adult prisoners. Randomised, placebo-controlled trial. Br J Psychiatry. 181:22-28, 2002.

[3] Zaalberg A, Nijman H, Bulten E, Stroosma L, van der Staak C: Effects of nutritional supplements on aggression, rule-breaking, and psychopathology among young adult prisoners. Aggressive Behavior, 36:117-126, 2010.

[4] Gow RV, Hibbeln J, Parletta N: Current evidence and future directions for research with omega-3 fatty acids and attention deficit hyperactivity disorder. Curr Opin Clin Nutr Metab Care, 18(2):133-138, 2015.