

Food additives and hyperactivity

Evidence supports a trial period of eliminating colourings and preservatives from the diet



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Competing interests: None declared.

Provenance and peer review: Commissioned; not externally peer reviewed.

BMJ 2008;336:1144

doi: 10.1136/bmj.39582.375336.BE

Whether preservatives and colourings cause or exacerbate hyperactive behaviours is an important question for many paediatricians and parents. A recent randomised placebo controlled trial in 297 children aged 3-9 years provides evidence of increased hyperactive behaviour after they ate a mixture of food colourings and a preservative (sodium benzoate).¹ In contrast to many previous studies, the children were from the general population and did not have attention-deficit/hyperactivity disorder. The trial found an adverse effect of the mixture on behaviour as measured by a global hyperactivity aggregate score. The daily dose approximated that found in two 56 g bags of sweets.

In view of the potential importance of these findings, the European Food Safety Authority (EFSA) recently provided an opinion that takes other evidence into account.² The release of the EFSA findings was reported in a news article in the *BMJ* under the headline "Agency rejects research on food additives" and the EFSA opinion was characterised as a "highly critical assessment."³ The news article stated that the EFSA has "rejected suggestions . . . of a link between hyperactivity in children and two mixtures of food colours and the preservative sodium benzoate."

Closer analysis of the EFSA report, however, does not support this negative interpretation. The EFSA panel reanalysed the data and found that their analysis with a recalculated global hyperactivity score "led to broadly similar conclusions" to the original paper. The panel concluded that, "the study provides limited evidence that the two different mixtures . . . had a small and statistically significant effect on activity and attention." Importantly, the trial examined a cohort of normal (not hyperactive) children, but the findings have obvious implications for children with hyperactivity.

The EFSA panel reviewed the evidence linking preservatives and colourings with hyperactive behaviours. The panel reviewed 22 studies from 1975 to 1994 and two meta-analyses. Of the 22 studies, 16 reported positive effects in at least some children. In positive studies, only a subgroup of those with hyperactive behaviours were affected by the additives. The most recent meta-analysis found that artificial food colours had an overall effect size of 0.283 (95% confidence interval 0.079 to 0.488) on the hyperactivity score, and this fell to 0.210 (0.007 to 0.414) after excluding the smallest and lowest quality trials.⁴

The panel rightly pointed out that attention-deficit/hyperactivity disorder has multifactorial causes, and exclusively focusing on food additives may "detract from the provision of adequate treatment" for children with the disorder. However, it could be said that neglecting the substantial body of evidence on dietary factors may also do this.

Three main treatments are available for hyperactivity

in children—drugs, behavioural therapy, and dietary modification. Interestingly, the use of drugs and dietary modification is supported by several trials,^{4,6} whereas behavioural therapy—which is presumably thought necessary for "adequate treatment"—has little or no scientifically based support.^{6,7} A recent review of treatment by the American Academy of Paediatrics Subcommittee on Attention-Deficit/Hyperactivity Disorder said that, "the evidence strongly supports the use of stimulant medications," whereas "behaviour therapy alone has only limited effect on symptoms."⁷ For unknown reasons, the subcommittee did not review dietary modification.

Eliminating colourings and preservatives is regarded by some as an "alternative" treatment rather than a "standard" treatment (stimulant drugs) for attention deficit disorder.⁸ "Alternative" medicine is popular with the public—40-50% of children attending tertiary children's hospitals in the UK and Australia have used it in the past year⁹—but it is rightly regarded with suspicion by many medical practitioners because of lack of evidence. However, meta-analysis shows that dietary elimination of colourings and preservatives provides a statistically significant benefit. In view of the relatively harmless intervention of eliminating colourings and preservatives, and the large numbers of children taking drugs for hyperactivity (2.4% of children in the state of Western Australia receive stimulant drugs for attention deficit disorder¹⁰), it might be proposed that an appropriately supervised and evaluated trial of eliminating colourings and preservatives should be part of standard treatment for individual children.

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