Winner of the Morris Markowe Prize 2011

Dispelling Dyslexia with Omega-3: Fishy or For Real?

Hailed as 'brain food', omega-3 has been hitting the headlines again. Many of us may remember the pinched noses and curled lips that came with swallowing cod liver oil in the name of keeping mother happy, thinking she was making us cleverer. Now, hot-off-the-press is the launch of yet another omega-3 food product for children, this time, a range of sauces in a line-up of enticingly fruity flavours. Commanding more than €180 million in the European market in 2007 and expected to be worth €820 million by 2014, omega-3 fatty acids are big business.

Bigger still is its media image as a natural panacea. Even revered chef Heston Blumenthal recently relied on offerings of oily fish as brain fuel to win over the brawn of the Royal Navy. Whilst Heston's successful naval mission was inspired by Dr Sandrine Thuret's laboratory experiments at the Institute of Psychiatry, London, how does omega-3 supplementation actually translate to the performance of our children who battle with dyslexia? An increasingly pertinent question with exams around the corner and tightened family purse strings.

Not just a Reading or Spelling Difficulty

The commonest UK disability in education, dyslexia is a complex disorder described by Professor John Stein (brother of famous seafood chef, Rick) as involving a range of difficulties in reading, spelling and writing, as well as organisation, direction orientation, short term memory, visual and/or auditory processing, balance, spoken language and more. Dyslexia often comes hand-in-hand with other childhood difficulties such as dyspraxia, ADHD, anxiety, depression, self harm, suicide and behavioural difficulties. And its impact does not stop there. Taking part in multiagency meetings as a child psychiatrist, I am acutely aware of the stresses, not only for the children, but also their families, school teachers, teaching assistants, Special Educational Needs Co-ordinators and Educational Psychologists. With no available cure for this lifelong condition, it is not surprising that parents will frequently try remedies that offer some hope of improvement.

Essential in the Diet

Omega-3 is one of two essential fatty acids, the other being omega-6. Essential, because humans can't make them and they must therefore come from food. But they are also essential because they are key components of, and have a vital role in the brain and cell membranes. Our modern diets have become heavily loaded with omega-6, common in processed food from vegetable oils, meats and dairy products, leaving a smaller ratio of ingested omega-3. Studies suggest that this relative deficiency of omega-3 is linked with a rise in physical and mental disorders. Tom Brudenell Bruce, chief executive of London-based Eau Plus, who has developed a system of extracting omega-3 from algae, states: "The Japanese have a high omega intake and their IQ is 15 points higher on average than ours in the west. They also have the lowest incidence of brain disease and heart attacks".

Omega-3 and Dyslexia

As omega-3 fatty acids were being discovered to have major roles in cell membrane signalling, brain development and functioning, scientists were also finding some differences in the genes, brains, visual, auditory and balance systems of those with dyslexia compared to those without.

In the 1990s, Dr Jacqueline Stordy of Surrey University was the first to notice an association between breastfeeding and the severity of dyslexia, as well as poor night vision in young dyslexics, which improved with omega supplementation. Meanwhile, other scientists found lower levels of fatty acids in boys with more behavioural problems, temper tantrums, sleep problems, and learning difficulties than their peers. These lower levels of essential fatty acids were also found in blood samples of those with dyslexia, along with abnormal cell membranes. Many also showed signs of essential fatty acid deficiency, such as excessive thirst, dry hair and skin, frequent urination and soft, brittle nails. Dr Alex Richardson from Oxford University noted in dyslexic children that "those with more clinical signs of fatty acid deficiency had more severe difficulties in reading, spelling and working memory". Researchers began to look into the use of omega-3 supplements in people with dyslexia.

The Evidence to date

Despite all the media reports of omega-3 improving school performance, there are surprisingly few trials on supplementation in children. Only four trials focused specifically on those youngsters with dyslexia, three of which are published in detail. Unfortunately, each study showed different results as they looked at different aspects of dyslexia; some showed positive findings of improvement and some, no effects. There was also little consistency between them. The studies varied in the way the trial was conducted, with different duration of supplementation, doses of omega-3, ages of the children, their school setting and just to confuse the matter further, involved different countries and languages. No overall agreed conclusions can be made to support omega-3 supplementation in dyslexia.

What the research does clearly show is that larger and long-term studies are crucially needed in this area, designed to give results that can be applied to everyday life. Experiments looking at rats, brain cells in laboratory dishes or reading in Nordic languages are difficult convert into helping those young dyslexics I saw in clinic last week. Mark was excluded for the third time this term and Jess has been cutting herself from exam stress, convinced that she will fail. Both of their mothers desperately wanted to try something that would help.

The Future

Everyone knows that bad food is harmful for our children's physical health, but it has taken much longer for us to realise that the mind and brain may be the first and most sensitive parts of the body to be affected. The research into the effects of diet on our children's brains lags well behind the studies into their physical health. We need to shift more of the spotlight onto disabling conditions such as dyslexia. Otherwise, our children will be left struggling not only with their

education and literacy, but with the arguably more debilitating mental health associations such as depression, anxiety and poor self esteem which can hinder the rest of their lives: a sizeable proportion of our society's talent could be lost. But how we can make this change? I'm not sure. But I might have some ideas after tucking into that juicy salmon steak.

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