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Omega-3 Fats Show Promise for Maintaining Mental Health

By Greg Arnold, DC, CSCS, January 9, 2011, abstracted from "Dietary Supplementation with the Omega-3 Fatty Acid Docosahexaenoic Acid in Traumatic Brain Injury?" in Neurosurgery online

Link - http://www.nowfoods.com/BasicArticles/081410

According to the Centers for Disease Control, 1.7 million people sustain a traumatic brain injury (TBI). Of these, 52,000 will die and 275,000 are hospitalized. It is a contributing factor to nearly one-third (30.5%) of all injury-related deaths in the United States. About 75% of TBIs that occur each year are concussions or other forms of mild TBI, with traumatic brain injury costs an estimated $60 billion each year (1).

Now a new study in mice (2) suggests that DHA, an omega-3 fat found in the brain, may help maintain mental health after traumatic brain injury. In the study, 4 groups of 16 adult male rats weighing between 300-400 grams were given either DHA (3, 12, 40 mg/kg of bodyweight) or no supplementation for 30 days before being subjected to an impact acceleration traumatic brain injury. DHA supplementation was stopped 1 day before the induced injury.

The researchers then obtained brain tissue samples to measure for levels of a protein called APP, which is a marker for brain injury damage (3). They also measured levels of CD68, a marker of white blood cell activity (4), and caspase-3, a marker of cell death (5). Finally, the mice completed a water maze (6) to assess overall brain function.
The researchers found that DHA "significantly decreased" APP levels in a dose-related manner compared to the control group. Specifically, while those in the control group averaged APP levels of 37,442 axons per mm3, those in the 4 mg/kg/bw DHA group had 63% lower APP levels (13,995), those in the 12 mg/kg/bw group had 89% lower APP levels (4186), and those in the 40 mg/kg/bw group had 93% lower levels (2,827) ($p = 0.05$).

When looking at the CD68 levels, the 40 mg/kg group had 70% lower levels (2.1 vs. 7.1 cells per high-power field), the 12 mg/kg group had 31% lower levels (4.9 vs. 7.1) and the 3 mg/kg group had 27% lower levels (5.2 vs. 7.1). For caspase-3 levels, the 40 mg/kg group showed 80% lower levels (1.2 vs. 6.1 cells per high-power field), with the 12 mg/kg group showing 21% lower levels (4.8 vs. 6.1) and the 3 mg/kg group showing 31% lower levels (4.2 vs. 6.1).

For the Morris Water Maze, the 40 mg/kg group took 71% less time to complete the maze (31 vs. 107 seconds) while the 12 mg/kg group took 11% less time (96 vs. 107 sec) and the 3 mg/kg group took 7% less time (99 vs. 107 sec). The results led the researchers to conclude that "The potential for DHA to provide prophylactic benefit to the brain against traumatic injury appears promising and requires further investigation."

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Reference:

1. "Injury and Prevention Control" - http://www.cdc.gov/traumaticbraininjury/statistics.html
2. Mills JD. Dietary Supplementation With the Omega-3 Fatty Acid Docosahexaenoic Acid in Traumatic Brain Injury? *Neurosurgery* 68:474–481, 2011 DOI: 10.1227/NEU.0b013e3181ff692b
3. "APP" - http://ghr.nlm.nih.gov/gene/APP
4. 'The "classical" macrophage marker CD68 is strongly expressed in primary human fibroblasts' - http://www.ncbi.nlm.nih.gov/pubmed/16888915?dopt=AbstractPlus
5. "Emerging roles of caspase-3 in apoptosis" - http://www.nature.com/cdd/journal/v6/n2/abs/4400476a.html
6. "Morris Water Maze" - http://www.watermaze.org/