Concurrent Session 17: Polyunsaturated Fatty Acids

Polyunsaturated fatty acids intakes in children with ADHD

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Background – Research has shown a direct relationship between attention-deficit/hyperactivity disorder (ADHD) and omega-3 (n-3) polyunsaturated fatty acids (PUFA). However, no study to date has investigated relationships between ADHD and dietary n-3 PUFA intake
Objectives – To assess dietary PUFA intakes in children with ADHD, to compare these intakes to the previously published estimates of children's PUFA intake using the data from the Australian National Nutrition Survey (NNS), and to determine if there is a relationship between dietary n-3 PUFA intakes and ADHD symptoms.
Design – Eighty six three-day weighed food records were collected from children with ADHD. Their dietary PUFA intakes were analysed using FoodWorks nutrient analysis software package. Results were compared to the previously published estimates of children's PUFA intake from the NNS and correlations between dietary PUFA intakes and ADHD symptoms were investigated.
Outcomes – The average (median) daily intakes of fatty acids (mg/d) are: linoleic (LA), 8425 (7745); arachidonic (AA), 67 (55); total n-6, 8492 (7801), alpha-linolenic (ALA), 1188 (1023), eicosapentaenoic (EPA), 30 (10), docosapentaenoic (DPA), 31 (19), docosahexaenoic (DHA), 39 (17), long chain (LC) n-3 (addition of EPA, DPA and DHA), 95 (68) and total n-3, 1282 (1133). The mean daily intake of LA, total n-6 and DHA were significantly lower when compared to the NNS ($P<0.05$). Despite lower DHA intakes, no significant correlations were found between any fatty acids and ADHD symptoms. However, children with ADHD consumed significantly less fish/seafood, meat and eggs when compared to the NNS.
Conclusion – Children with ADHD consume less DHA, fish/seafood, meat and eggs than the NNS. Hence, these children are encouraged to increase their consumption of LC n-3 PUFA containing foods.

The DINO trial outcomes: Does high dose dietary docosahexaenoic acid improve the neurodevelopmental outcome of preterm infants?

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Background – There is uncertainty about the neurodevelopmental benefit of dietary docosahexaenoic acid (DHA) in preterm infants.
Objective – To determine whether preterm infants receiving the estimated *in utero* supply of DHA (≈1% of dietary fatty acids) have improved neurodevelopment.
Design – Infants born <33 weeks' gestation were randomly allocated to high-DHA (≈1% total fatty acids) or standard-DHA (≈0.3% total fatty acids) until term corrected age (CA) according to a concealed schedule stratified for sex and birth weight (<1250 g and ≥1250 g). Primary outcome was Bayley Mental Development Index (MDI) at 18 months' CA. *A priori* subgroup analyses were conducted based on randomization strata.
Outcomes – 657 infants were randomized to high- (n=322) or standard- (n=335) DHA groups. 93.5% completed the 18 month follow-up. There were no overall differences in MDI between groups, but fewer infants in the high-DHA group had mildly delayed (18.5% vs. 25.9%, p=0.05) and significantly delayed (4.7% vs. 10.1%, p=0.02) mental development. In the <1250g sub-group, infants fed high-DHA had higher MDI scores than the standard-DHA group (Mean Difference, MD, 5.1, 95% CI 0.5, 9.6 p=0.03) and fewer infants had mildly delayed mental development (16% vs. 32.6%, p=0.01). Girls fed high-DHA had higher MDI scores than girls fed the standard-DHA diet (MD 4.5, 95% CI 0.4, 8.7 p=0.03) and this translated to fewer girls with mildly delayed (9.9% vs. 25%, p=0.01) and significantly delayed (1.4% vs. 9.7%, p=0.01) mental development. The MDI of boys did not differ between groups.
Conclusion – Infants born <1250g benefit from high-DHA in early life and high-DHA improves the MDI scores of girls (Australian New Zealand Clinical Trials Registry number ACTRN12606000327583).