

Health News from 3Care Therapeutics

In this week's edition of 3Care's Omega-3 News, we want to share abstracts of three recently published studies that expand our understanding of the cardiovascular and blood sugar handling benefits of omega-3. Together, these investigations add further evidence to the contention that omega-3 supplementation:

- Supports cardiovascular health, including blood pressure
- Helps prevent metabolic syndrome and addresses associated dyslipidemia
- Improves blood sugar metabolism (increasing 0-3/0-6 fatty acid ratio)

Moderate consumption of fatty fish reduces diastolic blood pressure in overweight and obese European young adults during energy restriction

Objective

Dietary intervention studies suggest that a daily fish meal can improve blood pressure (BP); however, such a dietary regimen might be difficult to sustain. The objective of the present study was to investigate whether salmon consumption three times per week improves BP during energy restriction in young adults.

Methods

In this 8-wk intervention, 324 subjects (20–40 y of age, body mass index 27.5–32.5 kg/m², from Iceland, Spain, and Ireland) were randomized to one of four energy-restricted diets (–30% relative to estimated requirements): salmon (150 g three times per week, resulting in a daily consumption of 2.1 g of ω-3 long-chain polyunsaturated fatty acids [ω-3 LC-PUFAs]), cod (150 g three times per week, 0.3 g of ω-3 LC-PUFAs per day), fish oil capsules (1.3 g of ω-3 LC-PUFAs per day), or control (sunflower oil capsules, no seafood). Body weight, diastolic BP (DBP), systolic BP (SBP), and docosahexaenoic acid (DHA) in erythrocyte membrane were measured at baseline and endpoint.

Results

Participants showed weight loss (-5.2 ± 3.2 kg, $P < 0.001$) and decreases in SBP (-4.4 ± 8.6 mmHg, $P < 0.001$) and DBP (-4.1 ± 7.4 mmHg, $P < 0.001$) after the intervention. The salmon ($B = -2.71$, $P = 0.032$) and fish oil ($B = -2.48$, $P = 0.044$) groups had significantly lower endpoint DPB than the cod group, but not significantly different from control. **Lower baseline DHA (percentage) in erythrocytes was associated with greater DBP reductions ($B = 0.576$, $P = 0.017$).**

Conclusion

Salmon consumption three times per week can decrease DBP similar to fish oil and significantly more than lean fish during an 8-wk energy restriction in young overweight individuals. A lower DHA content in

erythrocyte membrane at baseline, which might identify infrequent fish eaters, is associated with a greater DBP reduction in the course of an 8-wk dietary intervention providing fatty seafood.

Lipogenic enzyme activities and glucose uptake in fat tissue of dyslipemic, insulin-resistant rats: Effects of fish oil

Objective

The purposes of the present work were twofold: (1) investigate same mechanisms involved in the development of fat cell hypertrophy in the experimental model of dyslipidemia and whole-body insulin resistance induced in rats chronically fed a sucrose-rich diet (SRD); and (2) analyze the possible beneficial effect of fish oil on these mechanisms.

Methods

For 6 months, male Wistar rats received a sucrose-rich diet (62.5% w/w sucrose, 8% corn oil) or a control diet in which sucrose was replaced by starch. After this period, the sucrose-fed animals were divided randomly into two groups: the first one continued with the same diet up to 8 mo and the second one received the same diet, but with corn oil replaced by 7% fish oil + 1 % corn oil. Rats were fed with this diet for the next 2 mo.

Results

Although an enlarged fat cell lipolysis and an impaired insulin-stimulated glucose uptake were present in the fat cells of SRD-fed rats, an increase of several key enzymes of the novo lipogenesis could be one of the possible mechanisms involved in visceral adiposity. **The addition of dietary fish oil restored or improved the above abnormalities.**

Conclusion

This study shows possible mechanisms conditioning the influence of nutrients (fish oils) on the development and management of dyslipidemia, insulin sensitivity, and fat cell accretion, all abnormalities present in the metabolic syndrome.

Dietary ω -3 fatty acid and ω -3: ω -6 fatty acid ratio predict improvement in glucose disturbances in Japanese Brazilians

Objective

We investigated whether lifestyle-induced changes in dietary fat quality are related to improvements on glucose metabolism disturbances in Japanese Brazilians at high risk of type 2 diabetes.

Methods

One hundred forty-eight first- and second-generation Japanese subjects with impaired glucose tolerance or impaired fasting glycemia who attended a lifestyle intervention program for 12 months were studied in Brazil. Dietary fatty acid intakes at baseline and after 12 months were estimated using three 24-hour

recalls. The effect of dietary fat intake on glucose metabolism was investigated by multiple logistic regression models.

Results

At baseline, mean \pm standard deviation age and body mass index were 60 ± 11 y and 25.5 ± 4.2 kg/m², respectively. After 12 months, 92 subjects had normal plasma glucose levels and 56 remained in prediabetic conditions. Using logistic regression models adjusted for age, gender, generation, basal intake of explanatory nutrient, energy intake, physical activity, and waist circumference, the odds ratios (95% confidence intervals) for reversion to normoglycemia were 3.14 (1.22–8.10) in the second tertile of total ω -3 fatty acid, 4.26 (1.34–13.57) in the second tertile of eicosapentaenoic acid, and 2.80 (1.10–7.10) in the second tertile of linolenic acid. **Similarly, subjects in the highest tertile of ω -3: ω -6 fatty acid ratio showed a higher chance of improving glucose disturbances (2.51, 1.01–6.37).**

Conclusions

Our findings support the evidence of an independent protective effect of ω -3 fatty acid and of a higher ω -3: ω -6 fatty acid ratio on the glucose metabolism of high-risk individuals.

Volume #22 January 13, 2010 3Care Therapeutics