OMEGA-3 FATTY ACIDS, INFLAMMATORY STATUS AND BIOCHEMICAL MARKERS OF PATIENTS WITH SYSTEMIC LUPUS ERYTHEMATOSUS: A PILOT STUDY

Background

- The main components of omega-3 are α-linolenic acid, EPA, and DHA. This can help reduce the prevalence of certain diseases like DM, CVD, and AMI. It also can control the production of CRP, proinflammatory cytokines (IL-6 and IL-10), chemokines, and adipokines (leptin and adiponectin)
- SLE = systemic lupus erythematosus
    - Inflammatory autoimmune disease where the organs and tissue are targeted by immune cells. It can cause tissue damage.
- In this study, the researchers focused on the relationship between omega-3 supplementation containing fish oils and women patients with SLE.

Purpose

- To determine whether the omega-3 has the influences of inflammatory biomarkers in SLE women patients.

Terms:

- EPA = Eicosapentaenoic acid
- DHA = Docosahexaenoic acid
- CRP = C-reactive protein

Biomarkers

- Cytokines: IL-6 and IL-10
- Adipokines: Leptin and Adiponectin
- C-reactive protein
- Glucose
- Lipids

Hypothesis

Supplementation of omega-3 will cause reduction in the circulating levels of inflammatory biomarkers.

Methods

Participants:

- 18-60 yo female patients with SLE
- stable doses of medications for SLE treatment
- BMI: 28.4 kg/ m^2

Study duration: 12 weeks

- Visits: Baseline (T0), Week 12 (T1)
- Avoided omega-3-rich foods

Study group (n = 22)

- 2 tablets / day of omega-3 fatty acids (540 mg EPA, 100 mg DHA)

Control group (n = 27)

- received nothing (no placebo)

Outcome Variables

- Median variations (IQR), between groups, of serum cytokines, adipokines, CRP, biomarkers

Results

- There was a statistically significant difference in CRP levels between the omega-3 group and the control group.
  - Decrease in the omega-3 group and increase in the control group
- IL-6, IL-10, leptin, and adiponectin did not show significant changes after 12-week treatment in either the omega-3 group or the control group.
- The concentrations of fasting blood glucose, total cholesterol, and LDL-cholesterol showed a statistically significant increase in the omega-3 group.
- LDL cholesterol significantly increased in the control group.

Table 3 – Serum concentrations of cytokines, adipokines and biochemical markers at T0 and T1 in both groups.

Variable	Omega 3 group N=22			Control group N=27		
	T0 Median (IQR)	T1 Median (IQR)	p[a]	T0 Median (IQR)	T1 Median (IQR)	p[a]
IL-6 (pg/mL)[b]	0.57 (0.40–2.90)	1.10 (0.60–2.80)	0.821	1.09 (0.52–1.98)	0.88 (0.33–2.08)	0.946
IL-10 (pg/mL)[b]	19.05 (9.88–40.87)	29.90 (9.80–56.30)	0.363	21.41 (6.72–51.64)	26.08 (11.38–47.54)	0.332
Leptin (ng/mL)	80.03 (63.21–129.40)	93.20 (54.80–153.40)	0.506	58.12 (36.65–109.20)	77.20 (50.00–103.00)	0.416
Adiponectin (μg/mL)	42.30 (24.88–58.01)	44.9 (23.90–57.20)	0.465	40.08 (27.69–59.47)	44.50 (20.00–59.00)	0.462
Glucose (mg/dL)	77.5 (75.2–82.8)	83.0 (75.0–87.0)	**0.043**	78.0 (71.0–86.0)	77.5 (72.2–85.0)	0.354
Cholesterol (mg/dL)	168.0 (151.0–194.0)	188.0 (162.0–214.5)	**0.012**	182.0 (155.5–192.2)	176.0 (152.0–199.8)	0.067
LDL-c (mg/dL)	95.0 (80.0–116.0)	115.5 (90.0–129.2)	**0.003**	100.0 (84.5–111.8)	98.0 (76.0–125.0)	**0.019**
HDL-c (mg/dL)	52.0 (38.0–57.0)	53.0 (47.0–67.0)	0.537	53.0 (37.8–63.2)	53.5 (45.5–59.0)	0.857
Triglycerides (mg/dL)	88.0 (64.0–124.0)	70.0 (57.0–98.5)	0.520	79.5 (59.5–114.0)	87.0 (63.2–128.0)	0.657
CRP (mg/dL)	5.0 (4.9–8.1)	4.9 (4.9–7.2)	0.230	6.4 (4.9–11.6)	5.0 (4.9–11.6)	**0.009**

IL, interleukin; CRP, C-reactive protein.

[a] Nonparametric paired Wilcoxon.

[b] IL-6, Omega 3 Group $n = 21$; control group $n = 26$; IL-10, Omega 3 Group $n = 14$; control group $n = 21$.

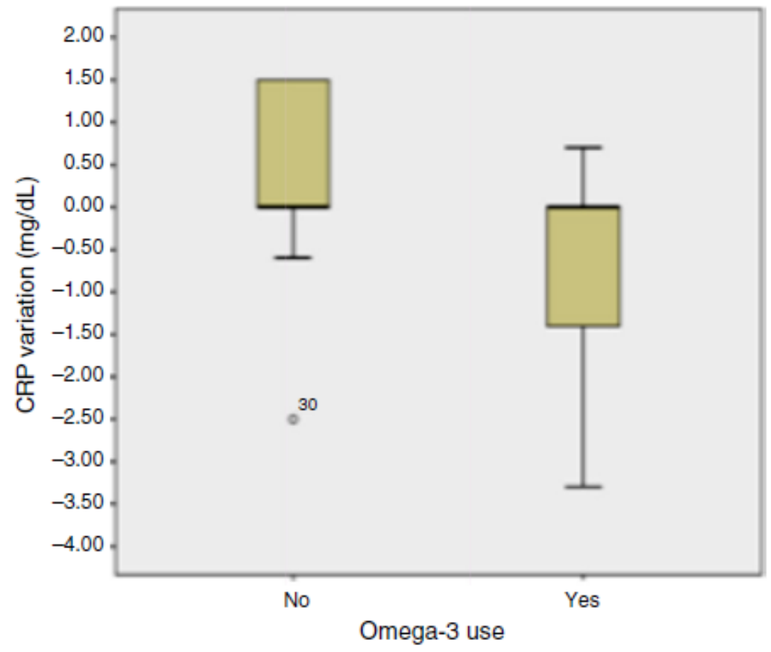

Fig. 2 – Box-plot of median (range) of C-reactive protein levels variations (ΔV) between T0 and T1 in treatment and control groups.

Discussion

- After 12 weeks, there was no statistically significant difference in the following biomarkers: IL-6, IL-10, leptin, adiponectin, glucose, and lipid between the omega-3 group and control group. Only the CRP had a significant difference between the omega-3 groups and control groups.
- Overall, the omega-3 supplement doesn't influence female patients who have SLE.

Limitations:

1. All participants were female patients
2. It's a pilot study
3. Diversity (Brazil)
4. Duration of the study

Questions:

1. Will safely increasing the dosage of omega-3 fatty acids lead to any statistically significant difference in results?
2. How can an increase in the diversity of SLE participants (i.e. gender, ethnicities, etc.) affect the biomarkers?
3. If the participants were allowed to consume omega-3 foods along with the treatment, how would that affect the results?