

**Assessing The effect of omega -3 supplements on the serum levels of selected cytokines involved in cytokine storm of Covid-19; A randomized clinical trial in the Covid-19 uninfected Jordanian people**

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**Abstract**

**Objectives**

Conduct a randomized controlled clinical trial to establish the effect omega-3 (n-3FA) supplementation on serum levels of selected cytokines associated with cytokine storm in sixty-nine non-COVID-19 Jordanian participants with vitamin D deficiency.

**Methodology**

This randomized controlled clinical trial was designed to randomly split 69 participants (41 males and 28 females), eligible participants into two groups; interventional and control. The physical and clinical factors of individuals in both groups were measured and analyzed. The comparisons between the two groups and the changes in each group before and after taking Omega-3(n-3FA). Possible factors that have a role in the changes shown by multivariate stepwise regression were identified. The follow-up period lasted 10 weeks. Serum levels of 25-hydroxy vitamin D (25OHD), Interleukin 6 (IL-6), Interlukin10 (IL-10), Interleukin 1 $\beta$  (IL-1  $\beta$ ) and tumor necrotic Factor (TNF- $\alpha$ ) were assessed at baseline and at the end of the trial after 10 weeks.

**Results**

Supplementation of n-3FA alone increased serum IL-1 $\beta$  ( $3.92 \pm 2.79$  ng/ml to  $7.29 \pm 1.87$  ng/ml,  $P_A < 0.001$ ), IL-6 ( $3.57 \pm 2.93$  ng/ml to  $22.67 \pm 12.24$  ng/ml,  $P_A < 0.001$ ), IL-10 ( $1.95 \pm 0.63$  ng/ml to  $2.70 \pm 1.69$  ng/ml,  $P_A = 0.019$ ), and n-3FA intake decreased serum 25-hydroxy vitamin D levels ( $24.52 \pm 4.91$  ng/ml to  $15.75 \pm 6.39$  ng/ml,  $P_A < 0.001$ ).

**Conclusion**

Extensive doses of n-3FA (1000 mg/day for 8 weeks) may have negative potential effects during cytokine storm significantly increased IL-6 level which is an important marker that associated with an increase in the levels of cytokine storm.

Trial registration: This trial was registered at [clinicaltrials.gov](https://clinicaltrials.gov) as NCT04483271.

**Keywords:** Omega-3 fatty acids, Cytokines, Cytokine storm, TNF- $\alpha$ , IL-1 $\beta$ , IL-6, IL-10, Vitamin D deficiency.