



STÁTNÍ ZDRAVOTNÍ ÚSTAV

## COMED study: reduced mortality in COVID-19 patients with higher "omega-3 index"

**Preliminary information** The study statistically confirmed the hypothesis that a higher value of the so-called omega-3 index (sum of EPA+DHA+DPA in cell membranes) leads to lower mortality in COVID-19 patients, who usually succumb to pneumonia. This is an encouragement for further work in the field of nutrition and promotion to include long-chain omega-3 MK sources in the diet (not to be confused with essential ALA, although this is also of great importance).

### Prevention of chronic inflammation

One of the aims of the study targeted the prevention of chronic inflammation. Omega-3 fatty acids (FAs) are important, especially EPA and DHA, but also DPA. They may play a role in the pathogenesis of COVID-19. A serious complication of this diagnosis may be pneumonia, observed in up to 30% of moderate and severe cases. The study responds to a campaign by the Ministry of Health aimed at improving lifestyle. We know that the diet of the majority of the Czech population is deficient in these anti-inflammatory nutrients.

### What the study includes

In collaboration with the NIPH Prague (dept. Brno) and the Brno University Hospital, we collected and analyzed 217 "positive cases", based on the "COVID+" information, from February to the beginning of May 2021. After removing "confounders", a cohort of 160 people was statistically analyzed. We worked with data on the concentration of 20 different fatty acids in erythrocytes. This typically represents a time period of at least 2-4 months prior to hospitalization, for blood levels to stabilize. Due to the small number of patients, the population was not divided into males and females. The cohort was divided into quartiles, of 40 patients each, according to the % of levels of the sum of omega-3 (EPA+DPA+DHA), in whole blood.

### Epidemiological statistics confirmed a lower mortality

The comparison (deaths/survivors) of the highest quartile (Q4), where omega-3 index > 6.4% (EPA+DPA+DHA) was found, against the remaining 3 lower quartiles combined (Q1-Q2-Q3), is statistically conclusive! Relative risk (RR) = 0.23 (CI95% = 0.06-0.93), Z score = 2.06, P = 0.039, NNT = 6 (3.3-30.2) - a patient had probability to survive 1 : 6 if he/she has > 6.4% EPA+DPA+DHA in venous blood. If capillary blood values are measured, the values are multiplied by 0.78. Odds ratio (OR) = 0.19 (CI95% = 0.04-0.84), Z score = 2.19, P = 0.029. This is a conclusive result. There is no statistical age difference between Q4 and other quartiles.

### What the study results mean



The study was not straightforward, given the range of poly-morbidities. It was not about cure, but to see if a higher omega 3 index could prevent critical conditions, mortality, in the context of the "cytokine storm" that precedes the "eicosanoid" storm, in the context of pneumonia. The study is of course a pilot, but the result is consistent.

### **What our population looks like and what to do**

The omega-3 index values, which in our case we increase by DPA (it's about 20-23% of omega-3, excluding ALA), should be >8.0%. Almost no one in our population has these values. Values can be achieved if the diet is based on high doses of fatty fish (salmon, snapper, mackerel, sardines, etc.). Otherwise, the only way is to use fish oil, which is sold in many varieties. In our experiments (note legal contract with SZU, Vitana/Orkla company) we use triglycerides from Mollers (Norway).

### **Further research and monitoring**

We have some ideas on how to organize new studies, but mainly we want to intervene in different population groups. Omega-3 FAs have health importance throughout the life course and are part of primary and secondary prevention.

### **Questions from the public about what the result means?**

The expert team's simplified answer: "In the Czech Republic, about 30,000 people died from COVID-19. The likelihood of fatal pneumonia could be reduced by one-sixth if the body had a more appropriate cell membrane composition with sufficient omega-3 FAs (EPA, DPA, DHA). Mechanistically, it is conceivable that 5000 persons could survive. This is a small town in the Czech Republic, for example, the spa town of Luhačovice in Moravia. Lifestyle is simply essential for health and quality of life."

Prof. J.Ruprich et al., CZVP SZÚ, 10.6.2021