MATERNAL SUPPLEMENTATION WITH *KRILL OIL* ON LACTATION: EFFECT OF LC-PUFA CONCENTRATION ON HUMAN MILK.

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Background

Docosahexaenoic acid (DHA) is a major constituent of neuronal lipid bilayer and retinal membranes, thus playing a crucial role in brain and visual development of neonates. Due to the lack of enzymes for the synthesis of its precursors, dietary intakes are fundamental to provide neonates with adequate DHA supply, and maternal supplementation might represent a useful strategy to implement DHA contents in breast milk (BM), with possible benefits on neonatal neurodevelopment. *Antarctic krill* is a rich source of phospholipid-bound DHA, which entails an enhanced bioavailability.

Aim

This prospective, randomized, controlled pilot study aimed to evaluate whether maternal supplementation with krill oil increases BM concentration of DHA in breastfeeding mothers.

Methods

Sixteen women of infants admitted to the Neonatal Intensive Care Unit were enrolled between 4 and 6 weeks after delivery and randomly allocated in 2 groups. Group 1 (n=8) received an oral krill oil-based supplement providing 250 mg/day of DHA and 70 mg/day of eicosapentaenoic acid (EPA) for 30 days, whereas group 2 served as control. BM samples from both groups were collected at baseline (T0) and day 30 (T1) and underwent a qualitative analysis of LCPUFAs composition by gas chromatography/mass spectrometry.

Figure 1. Flow diagram of the main study phases

Conclusions

Oral krill oil supplementation effectively increases DHA and EPA contents in BM. Further study are necessary to demonstrate whether this strategy could support brain and visual development in preterm neonates.

Results

No between-group difference in percentage (%) DHA and EPA values was seen at baseline. A significant increase in %DHA (T0: median 0.23% [IQR 0.19;0.38], T1:0.42% [0.32;0.49], $p = 0.012$) and %EPA (T0: median 0.10% [IQR 0.04;0.11], T1:0.11% [0.04;0.15], $p = 0.036$) between T0 and T1 were shown in Group 1, whereas no difference was observed in Group 2. Consistently, a significant between-group difference was observed in percentage changes from baseline of DHA ($\Delta\%$ DHA, group 1: median 64.2% [IQR 27.5;134.6], group 2: -7.8% [-12.1;-3.13], $p = 0.025$) and EPA ($\Delta\%$ EPA, group 1: median 39% [IQR 15.7;73.4]; group 2: -25.62% [-32.7;-3.4], $p = 0.035$).

Figure 2. % DHA median at baseline T0 and T1 in breast milk of supplemented (group 1) vs. non supplemented (group 2) breastfeeding women.

Figure 3. % EPA median at baseline T0 and T1 in breast milk of supplemented (group 1) vs. non supplemented (group 2) breastfeeding women.