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Randomized trial of nutritional intervention evaluating the effect of rapeseed oil, margarine enriched Omega 3 and their association in relation to a standard diet based on olive oil

Introduction & Objective: Polyunsaturated Fatty Acids (PUFA) long chain, especially n-6 Arachidonic Acid (ARA) and the Docosahexaenoic acid n-3 (DHA) are important in the development and maturation of the newborn brain system. Their content in Human Milk (HM) varies with the mother's diet. Supplementation with n-3 PUFA (α -Linolenic Acid, ALA) could increase the concentration of DHA in milk. The objective of the study was to assess the composition of breast milk after 15 days supplementation of n-3 PUFAs.

Material & Method: Multicentric randomized trial (Human milk banks: Bordeaux, Lyon, Paris, Montpellier), according to a factorial design 4 groups of 20 women each. From D0 to D15, same diet (olive oil) and from D15 to D30 diets were: Olive oil (O); margarine rich in n-3 PUFA (M); rapeseed oil (C) and M+C (MC). Diets 1-4 provided an increasing ALA intake. In the 4 groups, there was constant supply of DHA (500 mg/d, 170 g Mackerel 2 times/week). The FA composition of milk (% of total FA) was determined by direct transesterification and analyzed by GC-FID, blinded group. Nutritional surveys were analyzed by Bilnut software. FA concentrations at day 30 were compared between groups by linear regression, with a test interaction between M and C.

Result: 80 mothers of term infants were included: Age 31.5 ± 4.2 , 66.1 ± 9.8 kg (mean \pm SD). ALA was higher in MC (2.2%) C (1.3%) and M (1.1%) groups ($p < 0.003$) vs. group O (0.8%). There was a tendency for the DHA to be higher in the MC group (0.54%) vs. O group (0.39%) ($p = 0.11$). The ratio LA/ALA was the lowest = 5.5 ($p < 0.001$) in the group MC and bonded to an ALA rate to 2.1%. ARA is the highest in group C (0.37% vs. 0.33% MC, M and O = 0.32, 0.34%; $p = 0.02$). The dietary survey showed a slightly high fat diet compared to RDA.

Conclusion: We recommend for lactating women, a balanced varied diet consisting of 170 g mackerel two times/week or equivalent, which covers the needs for DHA and ARA. Margarine consumption omega 3 and rapeseed oil improves the ratio LA/ALA (5.5) the most favorable ratio to increase the synthesis of DHA from ALA

Biography

Claude Billeaud has received his MD degree from the Medical University of Bordeaux, France in 1979 after graduating in Human Cytogenetics. He further studied pediatrics and has been the Clinical Assistant Director of Bordeaux University in the Departments of Pediatrics, Neonatology and Intensive Care since 1983. He currently serves as a Pediatrician in the Neonatal Unit at the Children's Hospital of Bordeaux, a Scientific Manager of Bordeaux-Marmande Human Milk Bank; a Lecturer and Head of Research (habilitation to direct research) in Neonatal Nutrition at the Medical University of Bordeaux. Also, his interest in research led him to graduate in Biology and Health, awarded Masters in Statistics applied to clinical research and completed a PhD in Nutrition and Food Science.

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