Abstract


The relation between the omega-3 index and arachidonic acid is bell shaped: synergistic at low EPA+DHA status and antagonistic at high EPA+DHA status.

Luxwolda MF, Kuipers RS, Smit EN, Velzing-Aarts FV, Dijck-Brouwer DA, Muskiet FA.

INTRODUCTION: The relation between docosahexaenoic (DHA) and eicosapentaenoic (EPA) vs. arachidonic acid (AA) seems characterized by both synergism and antagonism.

MATERIALS AND METHODS: Investigate the relation between EPA+DHA and AA in populations with a wide range of EPA+DHA status and across the life cycle. EPA+DHA and AA were determined in erythrocytes (RBC; n=1979), umbilical arteries (UA; n=789) and umbilical veins (UV; n=785).

RESULTS: In all compartments, notably RBC, the relation between EPA+DHA and AA appeared bell-shaped. Populations with low RBC-EPA+DHA (<2g%) exhibited positive relationships; those with high RBC-EPA+DHA (>8g%) negative relationships. Antagonism in UA and UV could not be demonstrated.

CONCLUSION: Both synergism and antagonism might aim at a balance between ω6 and ω3 long-chain polyunsaturated fatty acid (LCP) to maintain homeostasis. Synergism might be a feature of low LCPω3 status. AA becomes suppressed by antagonism from an RBC-EPA+DHA >8g%.

PMID: 21715149