

Abstract

N-3 Polyunsaturated Fatty Acid Profile Is Altered in Pregnant Women with Different Allergic Diseases [†]

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Abstract: The incidence of allergic problems has notably increased in recent decades, affecting approximately 20% of the population and becoming a public health issue. Some studies have suggested that asthma and atopy could result from an increased dietary intake of n-6 polyunsaturated fatty acids (PUFA) and a decreased intake of n-3 PUFA. During pregnancy, the fetus depends on the transplacental transfer of n-3 PUFA from maternal circulation, which implies that maternal lipid profile alterations might predispose to allergy onset during infancy and childhood. The aim of this study was to evaluate the circulating fatty acid profile in pregnant women with allergic problems as well as in fetal plasma at birth. Plasma samples from 73 allergic and 179 healthy pregnant women as well as cord venous plasma were collected at delivery in the NELA cohort (Murcia, Spain). Maternal allergy was diagnosed according to the symptoms and via a positive skin prick test. The fatty acid profile was determined by gas chromatography. The allergic mothers had a lower percentage of n-3 PUFA in the plasma compared to the healthy ones (Allergic: 4.06 ± 0.15 vs. Control: 4.66 ± 0.11 , $p = 0.002$), especially in those with asthma or food allergies. This contributed to a significantly higher n-6/n-3 PUFA ratio in women with allergies (Allergic: 9.45 ± 0.31 vs. Control: 8.28 ± 0.20 , $p = 0.002$), mainly asthma and food allergies, which was indicative of a proinflammatory status. The same tendency was observed in women affected by atopic dermatitis ($p = 0.094$). In cord blood, despite the fact that there were no differences in the n-6/n-3 PUFA ratio between the groups, the fetuses born from allergic mothers showed a tendency towards lower n-3 PUFA content compared to those born from healthy mothers (Allergic: 5.63 ± 0.19 vs. Control: 6.17 ± 0.21 , $p = 0.093$). In conclusion, allergy led to a decreased n-3 PUFA and an increased n-6/n-3 ratio fatty acid profile in pregnant women at delivery, especially in those affected by asthma and food allergies. The same tendency was observed in cord plasma. A higher n-3 PUFA consumption could be desirable in women with allergic diseases in order to improve their lipid profile and proinflammatory status and their offspring's health.



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