Plasma Omega-6 Fatty Acids and the Risk of Cardiovascular Events in Patients after an Acute Coronary Syndrome: Insights from MERLIN-TIMI 36

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BACKGROUND

- Plasma omega-6 fatty acids (Ω6-PUFA) content has been inconsistently shown to be inversely correlated with the risk of CV events in primary prevention populations. Low dietary intake of gamma-linolenic acid (GLA) has been correlated with a variety of inflammatory diseases which may contribute to the pathogenesis of atherosclerosis.
- We examined the relationship between Ω6-PUFA and the risk of cardiovascular events in patients with NSTE-ACS.

METHODS

- Nested biomarker study in MERLIN-TIMI 36, a randomized controlled trial that compared ranolazine with placebo in patients with NSTE-ACS.
- Baseline plasma Ω6-PUFAs (7 species) was assessed through thin liquid chromatography in an cohort based case-control population.
- 795 cases (203 CV death, 325 MI, 271 VT, 161 AF).
- 1612 event-free controls.
- Logistic regression models including a weighted likelihood adjustment of Ω6-PUFA content.
- Results of multivariable analysis were adjusted for age, sex, BMI, hypertension, prior MI, prior HF, diabetes mellitus, smoking, eGFR, LDL-C, HDL-C, TG, statin use, index diagnosis, and treatment arm.

RESULTS

Table 1: Baseline characteristics by Ω6-PUFA Quartiles

<table>
<thead>
<tr>
<th></th>
<th>Ω6-PUFA</th>
<th>LDL-C</th>
<th>HDL-C</th>
<th>TG</th>
<th>hsCRP</th>
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</thead>
<tbody>
<tr>
<td>Q1</td>
<td>0.14*</td>
<td>0.18</td>
<td>-0.36*</td>
<td>-0.05*</td>
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</tr>
<tr>
<td>Q2</td>
<td>0.06*</td>
<td>0.01</td>
<td>0.12*</td>
<td>-0.14*</td>
<td></td>
</tr>
<tr>
<td>Q3</td>
<td></td>
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<td>Q4</td>
<td></td>
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Figure 1: Relative Proportion of Ω6-PUFA content.

Figure 2: Unadjusted OR per 1 SD increase of GLA.

GLA was significantly associated with a 28% reduced odds for CV death after Bonferroni-Holm correction (P<0.001).

CONCLUSION

- Plasma gamma-linolenic acid content shows a significant association with the odds of CV death after ACS.
- Other Ω6-PUFAs were not consistently associated with cardiovascular events.
- Future research should examine whether dietary intake of GLA after ACS may help to attenuate CV risk.