U-Shaped Association Between Consumption of Marine n-3 Fatty Acids and Development of Atrial Fibrillation

* a Danish Cohort Study

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U-Shaped Association Between Consumption of Marine n-3 Fatty Acids and Development of Atrial Fibrillation - a Danish Cohort Study

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Objectives
The aim was to investigate the association between consumption of marine n-3 polyunsaturated fatty acids (PUFA) and development of atrial fibrillation (AF).

Background
Previous studies have suggested a lower risk of AF with higher intakes, but results have been inconsistent.

Methods
A total of 57,063 Danish participants 50 to 64 years of age were enrolled in the Diet, Cancer, and Health Cohort Study between 1993 and 1997. Dietary intake of fish and marine n-3 PUFA was assessed by a semi-quantitative food frequency questionnaire. Time-to-event data was analysed in a Cox proportional hazards regression model using restricted cubic splines.

Results
3,345 incident cases of AF occurred over 13.6 years (Figure 1). The association was U-shaped between consumption of marine n-3 PUFA and risk of incident AF, with the lowest risk of AF at moderate intake near the median consumption of 0.63 g/day (Figure 2). When comparing quintiles of marine n-3 PUFA intake, a 13% statistically significant lower risk of incident AF was seen in the middle quintile (HR 0.87, 95% CI 0.78-0.98) compared with the lowest quintile of intake (Table 1). Intake of total fish, fatty fish, and the individual n-3 PUFA, eicosapentaenoic acid, docosahexaenoic acid, and docosapentaenoic acid also showed U-shaped associations with incident AF.

Conclusions
We found a U-shaped association between consumption of marine n-3 PUFA and risk of incident AF, with the lowest risk close to the median intake of total marine n-3 PUFA. A moderate dietary intake of marine n-3 PUFA may thus be preferable for primary prevention of AF.

Figure 1: Placement of participants in the Diet, Cancer, and Health Cohort Study (n = 57,063). Participants diagnosed with atrial fibrillation (AF) are represented in the Danish National Patient Registry.

Figure 2: Dietary consumption of total marine n-3 polyunsaturated fatty acids (PUFA) and risk of incident atrial fibrillation (AF) among a cohort of 57,063 Danish men and women aged 50-64 years. The 25th, 50th, and 75th percentiles are represented by the lowest, middle, and highest quartiles, respectively. The risk ratio with 95% confidence interval is shown for each quartile compared to the lowest quartile. The regression line adjusts for age, sex, smoking status, alcohol consumption, physical activity, and BMI. The dotted line represents the linear trend, while the dashed line represents the U-shaped trend. The model was adjusted for potential confounders, including age, sex, smoking status, alcohol consumption, physical activity, and BMI.

Table 1: Quantiles of dietary intake of marine n-3 polyunsaturated fatty acids (PUFA) and risk of incident atrial fibrillation

<table>
<thead>
<tr>
<th>Quartile</th>
<th>Median (g/day)</th>
<th>HR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>0.00</td>
<td>1.00 (1.00, 1.00)</td>
</tr>
<tr>
<td>Q2</td>
<td>0.30</td>
<td>0.85 (0.76, 0.95)</td>
</tr>
<tr>
<td>Q3</td>
<td>0.63</td>
<td>0.81 (0.73, 0.90)</td>
</tr>
<tr>
<td>Q4</td>
<td>0.96</td>
<td>0.85 (0.77, 0.94)</td>
</tr>
<tr>
<td>Q5</td>
<td>1.29</td>
<td>0.81 (0.74, 0.89)</td>
</tr>
</tbody>
</table>

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