2011-3

Treatment of Rheumatoid Arthritis with Marine and Botanical Oils: Influence on Serum Lipids (poster)

Barbara C. Olendzki  
*University of Massachusetts Medical School*

Katherine Leung  
*University of Massachusetts Medical School*

Susan Van Buskirk  
*University of Massachusetts Medical School*

*See next page for additional authors*

Follow this and additional works at: [https://escholarship.umassmed.edu/prevbeh_pp](https://escholarship.umassmed.edu/prevbeh_pp)

Part of the [Alternative and Complementary Medicine Commons](https://escholarship.umassmed.edu/prevbeh_pp), [Behavioral Disciplines and Activities Commons](https://escholarship.umassmed.edu/prevbeh_pp), [Behavior and Behavior Mechanisms Commons](https://escholarship.umassmed.edu/prevbeh_pp), [Community Health and Preventive Medicine Commons](https://escholarship.umassmed.edu/prevbeh_pp), and the [Preventive Medicine Commons](https://escholarship.umassmed.edu/prevbeh_pp)

Repository Citation


This material is brought to you by eScholarship@UMMS. It has been accepted for inclusion in Preventive and Behavioral Medicine Publications by an authorized administrator of eScholarship@UMMS. For more information, please contact Lisa.Palmer@umassmed.edu.
Treatment of Rheumatoid Arthritis with Marine and Botanical Oils: Influence on Serum Lipids (poster)

**Authors**
Barbara C. Olendzki, Katherine Leung, Susan Van Buskirk, George W. Reed, and Robert B. Zurier

**Comments**
Presented at the Massachusetts Dietetic Association Conference, March 2011.

This poster is available at eScholarship@UMMS: https://escholarship.umassmed.edu/prevbeh_pp/165
**BACKGROUND**

Over the past 30 years substantial progress has been made in the medical and surgical management of patients with rheumatoid arthritis (RA). Despite this progress, there is an increasing gap in mortality between patients with RA (1.5-3.0 fold risk) and the general population. This disparity is mainly attributable to cardiovascular disease (CVD) as the CVD risk is comparable in RA patients as to patients with diabetes mellitus. Although the reasons for this gap are not entirely clear, the traditional risk of abnormalities in lipid profiles appears to be enhanced by a chronic increase in inflammatory cytokines, resulting in accelerated atherosclerosis.

**Study Objective**

The object of this study was to determine the effect of marine (fish oil) and botanical oils (borage oil) on lipids and other endpoints in RA patients. Reductions in the concentration of lipids and inflammatory cytokines have been reported in patients with RA. Despite this progress, there is an increasing gap in mortality between patients with RA and the general population. This disparity is mainly attributable to cardiovascular disease (CVD) as the CVD risk is comparable in RA patients as to patients with diabetes mellitus. Although the reasons for this gap are not entirely clear, the traditional risk of abnormalities in lipid profiles appears to be enhanced by a chronic increase in inflammatory cytokines, resulting in accelerated atherosclerosis.

**METHODS**

**Population and Setting**

The study was an 18-month randomized, double-blind, placebo-controlled study conducted at the University of Massachusetts Medical School and by the Food and Drug Administration. Subsequent approvals were obtained from Review Boards at the University of Alabama, Geisinger Clinic, Fallon Health Care, and the New England IRB.

**Eligibility/Demographics for the RCT**

Patients were eligible to participate in the study if they had RA according to the 1987 criteria of the American Rheumatism Association, were in medical care and the sample was predominantly female (80%). Most were white (90%), married (69%), and had a mean body mass index (BMI) of 30.5. An equal number were retired (33%) or working full time (34%), and 16% listed themselves as disabled. There were no significant differences between groups.

**Analysis**

To assess the effect of the intervention on lipids, lipid values were modeled using a linear mixed model as a function of time (baseline, 9 month and 18 month, or final visit treated as a categorical variable) to assess the overall changes over time, outcome measures were modeled using linear mixed modeling as a function of time, treatment arm and with adjustment for baseline values. All analyses were intention to treat. Analyses included all participants with a baseline lipid measure.

**RESULTS**

**Serum Lipids Results**

<table>
<thead>
<tr>
<th>Group</th>
<th>Change from Baseline to 9 months (N=83)</th>
<th>Change from Baseline to 18 months (N=69)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total cholesterol</td>
<td>(-9.71 to -1.07)</td>
<td>(-12.99 to -3.86)</td>
</tr>
<tr>
<td>LDL</td>
<td>(-1.20 to -0.10)</td>
<td>(-0.53 to -0.74)</td>
</tr>
<tr>
<td>HDL</td>
<td>(-2.44 to 5.49)</td>
<td>(-13.73 to -5.11)</td>
</tr>
<tr>
<td>TC/HDL ratio</td>
<td>(-2.27 to -0.28)</td>
<td>(-2.01 to -0.20)</td>
</tr>
<tr>
<td>Triglyceride</td>
<td>(-2.43 to 3.14)</td>
<td>(-2.22 to 2.56)</td>
</tr>
<tr>
<td>Atherogenic Index of Plasma</td>
<td>(-0.20 to -0.16)</td>
<td>(-0.33 to -0.19)</td>
</tr>
</tbody>
</table>

**Triglycerides and Atherogenic Index of Plasma (AIP) by Group**

<table>
<thead>
<tr>
<th>Group</th>
<th>Change at 9 months: β (95% CI)</th>
<th>Change at 18 months: β (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combinations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group</td>
<td>-0.25 (0.58 to -0.28)</td>
<td>-0.20 (0.33 to -0.09)</td>
</tr>
<tr>
<td>Fish Oil</td>
<td>-0.29 (0.41 to -0.12)</td>
<td>-0.16 (0.32 to -0.06)</td>
</tr>
<tr>
<td>Borage Oil</td>
<td>-0.33 to 0.002</td>
<td>-0.17 (0.43 to -0.09)</td>
</tr>
</tbody>
</table>

**DISCUSSION**

Rheumatoid Arthritis (RA) is a chronic systemic inflammatory disease. Mediators of inflammation and prothrombotic factors contribute to endothelial dysfunction and development of cardiovascular disease in RA patients. Marine and botanical oils represent an excellent primary or secondary therapy for improvement of the cardiovascular risk management in RA patients.

Patients taking these oils exhibit significant additional reductions in total and LDL-cholesterol, triglycerides, the TC/HDL ratio, and in the atherogenic index, and experience a significant increase in HDL-cholesterol. All of these improvements in the lipid profile were seen after 9 months of therapy, and increased after 18 months of oils administration.

The overall dropout rate was 51%, and was similar across groups: 25 in the borage oil group, 28 in the fish oil group, and 22 in the combination group. Reasons for dropout were mainly gastrointestinal distress (belching, bloating, diarrhea, nausea, cramping), or an inability to swallow the large number of rather sizable capsules. This can be ameliorated by freezing the capsules and reducing their size. Among those evaluated for this study, compliance was 100%, assessed by pill counts.

**Learning Outcome**

All treatments were safe, thus treatment of RA patients with one or a combination of these or similar oils should prove useful for reduction of cardiovascular risk in RA patients.

**ACKNOWLEDGEMENT**

These studies were supported by the National Institutes of Health Grant RO1-AT000309 from the National Center for Complementary and Alternative Medicine. We are grateful for the statistical help of Robert Magner, and the efforts of the principal investigators at the 13 sites and their patients, without whom this study would not have been possible.