Dietitians Association of Australia Statement

Dietary fats and age-related macular degeneration

A public statement summarising the current Dietitians Association of Australia (DAA) perspective on an issue of importance to the nutritional welfare of the community.

Authorised September 2004

DAA Position
Epidemiological studies into dietary fats and age-related macular degeneration (AMD) have produced disparate results. At this early stage of the research, there is no consistent association between either total fat, or any class of fats, and AMD. Associations between dietary cholesterol and AMD are also inconsistent. There is little consistency between the accepted associations between dietary fats and coronary heart disease and the associations observed between dietary fats and AMD, bringing into question the atherosclerosis hypothesis of AMD. Therefore, there is currently no plausible mechanism to explain how total fat, animal fats, vegetable fats or cholesterol might increase AMD risk. Although there is a plausible role for long-chain omega 3 fatty acids in maintaining the integrity of the macula, the associations between fish, or long-chain omega 3 fatty acids, and AMD are also inconsistent. No specific dietary recommendations about dietary fats and macular degeneration are possible based on the existing evidence.

Recommendation
Due to the lack of evidence, it is not possible to provide an evidence-based recommendation regarding fat consumption and AMD. With regard to fat intake, DAA supports the Dietary Guideline for Australians for fat intake i.e. To limit saturated fat and to moderate total fat intake.

Background
The macula is the area located at the centre of the retina and is responsible for detailed, fine central vision. With age, degenerative changes in the macular region can occur leading to blurred vision, straight lines appearing wavy and the appearance of a dark or empty area in the centre of vision. AMD is the leading cause of vision loss in Australia and other developed countries. The impact of AMD continues to grow as the size of the elderly population increases. Among people over 75 years of age, about a quarter have some signs of macular degeneration and 6-8 per cent have some loss of vision.

The aetiology of AMD is poorly understood and few risk factors, other than age, have been identified. Associations of increased AMD risk with overweight (1), high blood pressure (2), serum lipids (3), inactivity (1) and low intakes of antioxidants (4) have been
observed, but not consistently. Subjects with elevated cardiovascular risk have increased risk of AMD, which has led to the hypothesis that AMD is related to atherosclerosis in the blood vessels that supply the retina (5). The consistent finding that smoking increases AMD risk provides some support for this hypothesis (6, 7) and has led to the further hypothesis that dietary fats may affect AMD risk. If true, the consumption of saturated, trans fatty acids and possibly dietary cholesterol would be expected to be associated with increased AMD risk and the consumption of linoleic acid and alpha-linolenic acid associated with lower risk. Total fat per se would not be expected to increase AMD risk.

Studies of dietary fat and AMD
To date, few studies into the possible relation between dietary fats and AMD have been conducted. Early findings from the retrospective Beaver Dam Study provided support for the atherosclerosis hypothesis – dietary intakes of saturated fat and cholesterol were associated with increased risk of early AMD (8). There were similar findings in the cross-sectional Blue Mountains Eye Study, though the relation with saturated fat failed to reach significance (9). Another cross-sectional study based on the NHANES III database in the United States showed no significant association between prevalence of AMD and either total fat or specific fatty acids in the diet (10). A case-control study conducted in the United States found higher vegetable fat consumption was significantly associated with increased risk for AMD (11). Monounsaturated fatty acids, polyunsaturated fatty acids and linoleic acid were associated with increased AMD risk. Saturated fats and alpha-linolenic acid were not significantly associated with risk of AMD in this study.

Only two prospective studies of dietary fats and AMD risk have been reported. Cho et al (12) examined the relation between intakes of total fat and specific types of fat and the incidence of AMD in the Nurses’ Health Study and Health Professionals Follow-up Study cohorts. Total fat intake was positively and significantly associated with risk of AMD, though this relation appeared to be due to the intake of an individual fatty acid, alpha-linolenic acid, rather than to total fat intakes per se. The consumption of saturated fats was associated with a modest, marginally significant increase in risk of AMD in this study. Cholesterol intake was not related to AMD risk.

Seddon et al (13) conducted a prospective cohort study of subjects with existing AMD. After 4.6 years of follow-up, higher total fat intake was significantly associated with increased risk of progression to advanced AMD. When analysed separately, intakes of both vegetable and animal fat were positively associated with progression, though the relation with animal fat was not significant. Monounsaturated and trans fatty acids were significantly associated with increased likelihood of progression of AMD, the stronger and more significant association being with trans fatty acids. Polyunsaturated fatty acids were significantly associated with increased risk of AMD in some analyses but not others. In spite of these associations, the consumption of nuts was associated with decreased risk of AMD. Dietary cholesterol was not reported in this study.

A protective effect of fish against the development or progression of AMD has been suggested in several studies (9, 11-13). These associations were not significant in all
analyses and in some cases were only significant when the subjects were stratified by linoleic acid intake (11, 13). Fish, or the long-chain omega 3 fatty acids found in fish, were not associated with protection against AMD in the Beaver Dam Study (8). In a case-control study, plasma levels of long-chain omega 3 fatty acids were not significantly associated with AMD (Sanders et al 1993).

No randomised controlled trials of dietary fat and AMD have been conducted.

**Summary of findings**

<table>
<thead>
<tr>
<th>Study</th>
<th>Significant associations of total fat and fat type with AMD</th>
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<tbody>
<tr>
<td>Mares-Perlman et al (1995)</td>
<td>Saturated fat</td>
</tr>
<tr>
<td>Heuberger et al (2001)</td>
<td>Nil</td>
</tr>
<tr>
<td>Seddon et al (2001)</td>
<td>Vegetable fat, Monounsaturated fat, Polyunsaturated fat, Linoleic acid</td>
</tr>
<tr>
<td>Cho et al (2001)</td>
<td>Total fat, α-linolenic acid</td>
</tr>
<tr>
<td>Seddon et al (2003a)</td>
<td>Total fat, Vegetable fat, Monounsaturated fat, Polyunsaturated fat, Trans fatty acids</td>
</tr>
</tbody>
</table>

**References**


4. VandenLangenberg GM, Mares-Perlman JA, Klein R, Klein BE, Brady WE, Palta M. Associations between antioxidant and zinc intake and the 5-year incidence of


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