

## **Dietary Carbohydrates Linked to Cataract Formation**

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BOSTON, June 7 — Carbohydrate intake in older nondiabetic persons is related to the development of nuclear and cortical lens opacities, researchers reported.

More specifically, results from an analysis of 3,377 men and women, ages 60 to 80, from the Age-Related Eye Disease Study, suggest that the glycemic index is associated with an increased risk of nuclear cataracts according to a report in the *American Journal of Clinical Nutrition*.

The glycemic index measures how fast a carbohydrate can raise blood glucose and may better describe the physiological effects of carbohydrates than the total quantity of carbohydrate intake, said Allen Taylor, Ph.D., at Tufts University here and colleagues.

The three major types of age-related cataracts are nuclear (affecting the center of the lens), cortical (affecting the adjacent peripheral area) and subcapsular opacities (those in the posterior outer aspect of lens tissue), the researchers wrote.

Participants in the study were divided into three categories (the highest 25%; the middle 50%; and the lowest 25%) according to their dietary glycemic index or total carbohydrate intake. The participants in the lowest 25% served as the referent category, the researchers said.

The cutoffs for total carbohydrate intake were 134.0 g/d and 176.1 g/d for the women and 155.4 g/d and 202.3 g/d for the men.

The cutoffs for the dietary glycemic index were 74.1 and 80.7 for the women and 76.5 and 82.1 for the men.

For participants in the highest quartile of carbohydrate intake, the glycemic index was associated with a higher prevalence of all pure nuclear opacities (grade > 2; odds ratio 1.29; 95% CI: 1.04-1.59; *P* for trend=0.02) and moderate nuclear opacities (grade ≥4; OR: 1.43; CI: 0.96-2.14; *P* for trend= 0.052).

A comparison of the highest with the lowest quartile of intake found an OR of 1.27 (CI: 0.99-1.63; *P* for trend=0.09) for cortical opacities of any severity (>0% of area opaque), while for moderate cortical opacities (>5% of area opaque), the OR was 1.71 (CI: 1.00- 2.95; *P* for trend = 0.056). Neither reached statistical significance.

The present study suggests a positive relation between the dietary glycemic index and nuclear opacities, the researchers wrote. However, the relationship between total carbohydrate intake and cortical opacities was not significant, and the presence of any cortical opacity in the present study, may have been due to the use of a lower cut-off for the definition of cortical opacity, they said.

It is possible, the researchers said, that foods with a higher glycemic index may increase the damage to the metabolically limited nuclear tissue of the lens by exposing the tissue to glucose for longer periods.

These findings add to an evolving biochemical, animal-based hypothesis that dietary carbohydrates may be associated with cataractogenesis, Dr. Taylor said. Prior evidence of cataract-related damage to lens proteins includes glycation, oxidation, cross-linking, and formation of advanced glycoxidation end-products, for example.

Although the glycation mechanism has been linked to other age-related chronic diseases, such as diabetes, and coronary heart disease, specific mechanisms underlying the carbohydrate association with lens opacities remain to be clarified, Dr. Taylor said.

A limitation of the presented study included the marginally significant association between glycemic index and moderate nuclear opacity, which was possibly due to inadequate power, the researchers said. Another limitation pointed out by the authors was the potential of residual confounding. "Although we adjusted for known cataract risk factors and those associated with cataract and correlated with carbohydrate variables in the AREDS, some unmeasured factors may have still confounded our results," they wrote.

The present analysis is one of a few studies that have reported association carbohydrate nutrition in

nondiabetic persons and lens opacities, and it is the first study to find a relationship between the dietary glycemic index and the risk of nuclear cataracts, the researchers said.

Moreover, they added, this study may add clinically relevant information about the risk of cataract formation and dietary recommendations.

"Because carbohydrate foods compose the main dietary component for humans, studies that further our understanding of the associations between carbohydrates and lens opacities are worthy of additional evaluation," the researchers wrote.

### **Action Points**

When talking to patients who may be concerned about developing cataracts, suggest that this study suggests that there may be an association between cataract formation and high dietary carbohydrate intake.

Point out that this type of study cannot establish a causative relationship.

Primary source: The American Journal of Clinical Nutrition

Source reference:

Chung-Jung Chiu, et al, "[Dietary carbohydrate intake and glycemic index in relation to cortical and nuclear lens opacities in the Age-Related Eye Disease Study.](#)" *The American Journal of Clinical Nutrition* 2006; 83: 1777-1784.