

Diabetic Retinopathy

DR and micronutrients

- Systematic review 2012 Ophthalmology no consistent results with micronutrients.
- No relationships in NHANES (Millen et al 2003), or ARIC (Millen et al, 2004)

Lipids and DMO

- Epidemiological evidence strong but no support from lipid lowering RCTs



Dyslipidemia and Diabetic Macular Edema

A Systematic Review and Meta-Analysis

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Topic: A systematic review and meta-analysis of dyslipidemia and diabetic macular edema (DME).

Clinical Relevance: Diabetic macular edema causes impairment of vision in patients with diabetes, and dyslipidemia has been reported as a risk factor for its development. A systematic review with a meta-analysis was undertaken to examine the evidence of an association between dyslipidemia and DME.

Methods: We defined eligibility criteria as randomized controlled trials (RCTs) and cohort, case-control, and cross-sectional studies reporting on the relationship between blood lipid levels and DME. We performed a literature search in MEDLINE, PubMed, and Embase from inception to September 2014. We used the Newcastle–Ottawa scale to assess the quality of case-control, cross-sectional, and cohort studies, and the Cochrane risk of bias tool for RCTs.

Results: The search strategy identified 4959 publications. After screening, we selected 21 articles for review (5 cross-sectional, 5 cohort, 7 case-control, and 4 RCTs). Meta-analysis of case-control studies revealed that mean levels of total serum cholesterol (TC), low-density lipoproteins (LDLs), and serum triglycerides (TGs) were significantly higher in patients with DME compared with those without DME (TC: 30.08; 95% confidence interval [CI], 21.14–39.02; $P < 0.001$; LDL: 18.62; 95% CI, 5.80–31.43; $P < 0.05$; TG: 24.82; 95% CI, 9.21–40.42; $P < 0.05$). Meta-analysis of RCTs did not show significant risk in worsening of hard exudates and severity of DME in the lipid-lowering group compared with placebo (hard exudates: relative risk, 1.00; 95% CI, 0.47–2.11; $P = 1.00$; DME: relative risk, 1.18; 95% CI, 0.75–1.86; $P = 0.48$).

Conclusions: Despite evidence from the cohort studies and meta-analysis of the case-control studies suggesting a strong relationship between lipid levels and DME, this was not confirmed by the meta-analysis that included only prospective RCTs. Therefore, given the significant public health relevance of the topic, the relationship between lipid levels and DME deserves further investigation. *Ophthalmology* 2015;122:1820-1827 © 2015 by the American Academy of Ophthalmology.

Lutein/Macular pigment

Non pro-vitamin A/provitamin A carotenoid ratio assoc with presence of DR in patients with diabetes (n=111) (Brazionis et al, 2008)

Some studies report relationship with macular pigment others don't, CAREDS n=1698 reported lower in diabetics.

AGE's and dietary inhibition

- Considered a significant pathogenic mechanism in the development of DR
- Bioactive molecule with significant pro-oxidant and pro-inflammatory activity
- Endogenous production by non-enzymatic glycation of proteins, lipids and nucleic acids
- Exogenous production from food- cooked food, approx 10 % serum AGEs from food (roasted, BBQ, broiled food etc)

Vitamin D

- Case control study Diabetics with and without retinopathy n=2– (Naguib et al 2012)
- Several recent positive reports of Vit D deficiency and presence and severity of DR but small/cross sectional studies.