Concurrent Session 16

Dietary fatty acids and the five year incidence of age-related maculopathy

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Background - Several prospective studies have found increased risk of age related maculopathy (ARM) in participants with high intakes of dietary fat, including monounsaturated and polyunsaturated fats.[1,2]
Objectives - To assess longitudinal associations between dietary fat and incident (ARM) in a cohort of older Australians.
Design - Population-based prospective cohort studied of 3654 persons, 49+ years, who participated in the Blue Mountains Eye Study (BMES I, 1992-4); 2335 (75.1% of survivors) were re-examined after 5 years (BMES II, 1997-9). Dietary data were collected from 2895 people at baseline (79%) using a semi-quantitative food frequency questionnaire, used to calculate dietary fat intakes. Fatty acids were analysed using the RMIT fatty acid database.[3] ARM was graded from retinal photographs (Wisconsin System). Logistic regression adjusted for age, sex, vitamin C and smoking.
Outcomes - Participants with the highest vs lowest quintiles of omega -3 polyunsaturated fat intake had lower risk of incident early ARM (OR 0.4, CI 0.2-0.8). A 40% reduction of incident early ARM was associated with fish consumption at least once /week (OR 0.6, CI 0.4-0.9), while fish consumption at least 3 times /week may reduce incidence of late ARM (OR 0.3, CI 0.1-1.0). We found no association between incident ARM and consumption of butter, margarine or nuts.
Conclusion - A diet high in fish, suggests protection against both early and late ARM. Our study could not confirm the deleterious effect of higher polyunsaturated fat intakes reported recently from other clinic-based studies.

References

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When is the best time for dietary LCPUFA supplementation; pregnancy or lactation?

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Background - Long chain polyunsaturated fatty acids (LCP) such as docosahexaenoic acid (DHA) and arachidonic acid (AA) have been associated with improved growth and development of infants. The relative importance of supplementation during pregnancy and/or during lactation remains to be elucidated.
Objective - The objective of this study was to evaluate in an animal model the effect of supplementing rat dams with LCPUFA during pregnancy and/or lactation on brain fatty acid status of pups.
Design - Hooded Wistar rats (n=24) were assigned to one of two dietary groups: LCP diet (5% DHA, 2.5% AA) or basal (B; no LCP) (both diets contained 35% LA, 5% ALA, ratio 7:1) and were fed their respective experimental diet for two weeks before and during pregnancy. At parturition the diets were changed for lactation where appropriate to create four groups– B-B, B-LCP, LCP-B, LCP-LCP. At fifteen days postpartum, animals were sacrificed. Samples were collected from dams (plasma, milk) and pups (plasma, brain) for fatty acid analysis.
Outcomes - Only small changes were seen in AA levels in all tissues for both dams and pups. Dams fed LCP during lactation showed equivalent DHA levels in tissues and milk to dams maintained on the LCP diet during both pregnancy and lactation (table). Dams fed LCP during pregnancy alone produced DHA levels in milk above those observed in dams fed basal diet throughout. Changes in dam tissue LCP were reflected in pup plasma and brain.
Conclusions - These data show that dietary supplementation of the mother with DHA in pregnancy and lactation, or lactation alone, has a notable effect on levels of brain DHA of the newborn. LCP supplementation during pregnancy only, improved LCP status of pups above that achieved on basal diet throughout.

Dietary treatment	Dam plasma DHA (n=6)	Milk DHA (n=6)	Pup Brain DHA (n)
Basal-Basal	3.89 ± 0.81^{1}	0.25 ± 0.06^{1}	13.90 ± 0.75^{1} (30)
Basal-LCP	7.17 ± 0.58^{2}	2.54 ± 0.27^{2}	15.72 ± 0.74^{2} (28)
LCP-Basal	5.80 ± 0.98^{3}	0.59 ± 0.16^{3}	15.03 ± 0.90^{3} (27)
LCP-LCP	7.91 ± 0.37^{2}	2.67 ± 0.23^{2}	15.67 ± 1.02^{2} (30)

Values are mean ± SD; values in column without common superscript are significantly different at $P<0.05$.
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