Reviewer's report

Title: Polyunsaturated fatty acid intake and prevalence of eczema and rhinoconjunctivitis in Japanese children: The Ryukyus Child Health Study

Version: 2 Date: 27 March 2011

Reviewer: Carel Thijs

Reviewer's report:

This is a well written report of a cross-sectional study on dietary fatty intake, with correct statistical methods and clearly presented results.

Fatty acids intake was estimate from a brief dietary food frequency questionnaire and eczema and allergic rhinoconjunctivitis in Japanese schoolchildren from Okinawa, Japan. Major limitations of the study are its cross-sectional design and the brevity and single measurement of food intake, as acknowledged and discussed by the authors. Their findings do not support a major hypothesis on food and atopic diseases related to the ratio of n-6 and n-3 fatty acids intake. Rather, a high level of arachidonic acid intake is found to be related to lower prevalence of eczema as well as rhinoconjunctivitis.

Major Compulsory Revisions

1. In the discussion the authors should also pay attention to previous studies (with inconsistent results) for arachidonic acid, including those which measured arachidonic in blood. For instance, the results are consistent with the inverse association between arachidonic acid proportion in blood during pregnancy and risk of eczema in the child (Notenboom, Clin Exp Allergy 2011) or childhood atopic manifestations (Dirix, BrJ Nutr 2009); by contrast Kompauer (Br J Nutr 2005) found a positive association between arachidonic acid and allergic rhinitis in adults in a cross sectional study. The authors should discuss the relation between dietary intake and body status of arachidonic acid, and the timing aspects (developmental phase of the disease (pregnancy, childhood, adulthood).

2. Discussion: please give more background information on the dietary sources of arachidonic acid (meat, eggs, dairy products?). Since some of these products may also be potential sources of trans fatty acids as well as n-3 LCPUFAs (depending on the local dietary habits, available foods, and production factors), these fatty acids could be indicators for each other and for their dietary sources. Please also indicate the levels of transfatty acids in the typical diet of Okinawa children, and whether these have changed over time.

Minor Essential Revisions

1. Please add the range of the fatty acid levels for the quintiles in table 2.

2. Discussion: please pay attention to the outcome measurement (ISAAC): is
ISAAC validated for Japanese children, is there independent confirmation (e.g. from medical records) of eczema and rhinoconjunctivitis?).

Discretionary Revisions

1. It would be extremely useful to have more background information on dietary sources of fatty acids, for instance in a table with major food products or groups and fatty acids intake.

2. Moreover, I would suggest that the authors add results on intake of relevant food groups and prevalence of eczema and rhinoconjunctivitis in the present paper.

3. Are the authors able to estimate the intake of transfatty acids? Based on an ecological survey in Europe, Weiland (Lancet 1999) suggested that allergies are related to high transfatty acids intake. A recent study suggested that this depends on the source of trans fatty acids: trans fatty acids from rumenic source was related with lower risk of infant eczema (Thijs, Allergy 2011). Could the authors attempt to estimate trans fatty acid intake and report the association with eczema and rhinoconjunctivitis?

4. Discussion p. 11: here results are presented on the characteristics of excluded participants, I would prefer to see these data in a separate column in table 1 rather than reading new data in the Discussion.

5. Discussion: could the authors provide more information on pollutants in local fish?

**Level of interest:** An article of importance in its field

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests.