Reviewer’s report

Title: Atopic dermatitis and indoor use of energy sources in cooking and heating appliances.

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Reviewer: Erik Van Miert

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Overall assessment:
The authors describe the analysis of the data set collected in 2002 and 2003 as part of Phase III of the ISAAC project in Spain, looking at possible association between the type of energy source used for cooking and heating and the frequency of atopic dermatitis (AD). The analysis of the data was conducted in a straightforward and transparent manner.

Only a few crude results showed some statistically significant associations and when adjusting for covariates no significant associations could be identified between the type of energy source used for cooking and heating and AD. In the absence of significant associations, the authors elaborate on the possible causative relationships being suggested by trends only. The authors identify some weaknesses of the study, but these weaknesses are rather used to explain why the study results do not support the starting hypothesis. Little energy is spent rejecting the starting hypothesis (which would be the most straightforward way of interpreting the data) or limiting the impact of the type of energy source used for cooking and heating on AD (at best a very weak association with no indication of a causative role).

Nevertheless, also a “negative study” has its scientific merit, and when the authors focus better on what the data really tell, the study is of scientific interest. The authors built a multivariate model “predicting” for AD, why not elaborating more on this, e.g. which parameters were significantly associated with AD, what about the association between energy source and social status...

Major Compulsory Revisions

1) It is clear that the indoor environment is characterized by a multitude of parameters of which not all were controlled in this study. As such, it is fair to state that by its nature and design, this study should not be expected to provide a definitive answer. Instead of describing what the data shows and putting this study in perspective to other studies, the authors spend too much effort trying to see in the data what is not there.

2) Nutritional and (personal) hygiene characteristics were not/poorly covered although the might very well be quite relevant e.g. no information about the diet, the use of cleaning products, whether the children were under medical treatment(medication), the presence of pets.... Moreover, no others atopic
endpoints were included in the study (e.g. atopic rhinitis, asthma) although inhalation would be suspected the main source of exposure if the usage biomass fuels would have an impact on the infants health. The ISAAC phase III environmental questionnaire typically addresses more aspects. Please clarify if (why) the entire data set coming from the ISAAC questionnaire in Spain was (not) looked at, i.e. justify the selection (if any).

Minor Essential Revisions

Abstract

3) Explain abbreviation cOR in abstract: crude odds ratio.

4) Refine sentence (include “statistical”): “… electric cooking appliances the cOR was 1.11 (95% CI: 0.99-1.24), near to statistical significance…”

Introduction

5) Sentence does not read well: “Chemical compounds indoors originating from heating/cooking systems and tobacco smoke lower the quality of the indoor air children are exposed to and increase the concentration of toxic compounds indoors” The chemical compounds do not increase the concentration of toxic compounds, the heating/cooking systems and tobacco smoke do…

6) Sentence does not read well: “Diesel particulate matter, on the other hand, triggers and increases the production of IgE and hydrocarbons released during kerosene combustion [10].” Where is the contradiction explaining the use of “on the other hand”? The second part of the sentence addresses kerosene combustion, not diesel particulate matter

Results

7) It should be made clearer that most of the mentioned “differences” are only small numerical differences.

8) The statement related to siblings is only somewhat for” younger siblings”.

Discussion

9) The authors start the discussion section by stating that an association between AD and indoor energy sources was not found, but they continue by stating that there seemed to be a slight influence of biomass fuel use. This contradictory statement needs clarification and substantiation.

10) It would add to the study if it was checked whether the heating/cooking parameters are retained in the model when step-wise backward logistic regression modeling would be used. This would also add some information on the relevance of the energy source in the model predicting for AD. Does leaving out the energy source variable change anything in the model?

11) Considering that none of the aOR related to electricity reached statistical significance and exceeded 1.16 the elaboration on electromagnetic waves is highly speculative and not justified considering that likelihood of confounding effects explaining the results related to electricity. One is even brought up by the authors, i.e. the hygiene hypothesis.
12) Study limitations: What about the possible relationship between parental education and reporting bias?

Discretionary Revisions


14) There is a well known negative relationship between social status (maternal education) and smoking behavior, 2 variables in the multivariate model. The frequency of ED shows a positive association with both (trend only for social status). This deserves some elaboration.

**Level of interest:** An article whose findings are important to those with closely related research interests

**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