Author's response to reviews

Title: The prevalence of dental erosion and associated risk factors in 12-13-year-old school children in Southern China

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Version: 2 Date: 9 June 2010

Author's response to reviews: see over
Dear Miss Gabriella Anderson,

Thank you very much for your kind letter of May 21, 2010 along with the valuable comments from the reviewers concerning our manuscript (1322209320372676) entitled “The prevalence of dental erosion and associated risk factors in 12-13 year old school children in Southern China”. We are very grateful to you and our reviewers for what you have done for us. The comments and suggestions from the two reviews are very helpful for our revision of the manuscript.

We have revised the manuscript according to the comments point-to-point. All revisions are displayed by coloured texts. The manuscript has been copyedited by a professional copyediting service provided by International Science Editing. We hope we have understood the meaning of these comments correctly and we are glad to waiting for your further comments and advice.

Two copies of the revised document attached. One of them is the new version of manuscript with highlight.

The revised manuscript is agreed by all authors and please feels free to contact me if more information is needed.

Yours sincerely,

Ping Wang, Huan Cai Lin, Jian Hong Chen, Huan You Liang
Corresponding author
Reviewer's report
Title: The prevalence of dental erosion and associated risk factors in 12-13 year old school children in Southern China
Version: 1 Date: 17 May 2010
Reviewer: Marilia Afonso Rabelo Buzalaf

This manuscript describes the prevalence of dental erosion and associated risk factors in 12-13-year-old Chinese children. The manuscript is well written, the methodology seems to be adequate and the results are consistent and adequately discussed. This reviewer has only minor comments in order to improve the manuscript's quality:

Reviewer's report:
- Discretionary revisions:
  a) Abstract: The first sentence could be rewritten as follows: "...developing countries and its prevalence has been shown to vary considerably...".
  b) Abstract 6th line: "...the information about dental erosion in China is scarce".
  c) Abstract methods: in the third line, please include the index used to evaluate the prevalence of erosion.
  d) Page 4: Please replace "little" by "scarce" at the end of the first paragraph.

    We agree. We have amended the sentences in the abstract and text in red colour (see Abstract: paragraph 1, sentence 1 and 3; paragraph 2, sentence 2; page 4, paragraph 2).

- Minor essential revisions:
  a) Page 6: Was there any clinical calibration exercise?
    Yes, the epidemiologist also provided instruction for the examiners during the pilot study. We have now added a new sentence for this in red colour (see page 7, paragraph 3, the last sentence).

  b) Page 9: The most frequently affected surface was the incisal/occlusal edge only. How can the authors be sure that these surfaces were affected by erosion and not by attrition? Did the authors consider to use an index to evaluate wear instead of an index to evaluate erosion only?
    According to the differential diagnosis of dental erosion proposed by Gandara et al. [1], the incisal surface contour appearing flat and shiny was defined as abrasion or attrition and was not included in the records in our study. We have now added sentences to explain this in red colour (see page 14, paragraph 1, the last sentence).


  c) Discussion page 10: The sentence "The variation in prevalence among
these studies may be partially explained by differences in the diagnostic criteria and indices" is not adequate at this point of the discussion section because the prevalences found in the present study and in the studies by Caglar et al. and Correr et al. are in fact very similar.

We agree. We have re-organized this paragraph (see page 12, paragraph 3).
Reviewer's report
Title: The prevalence of dental erosion and associated risk factors in 12-13 year old school children in Southern China
Version: 1 Date: 23 April 2010
Reviewer: María Esther Esther Josefina Irigoyen

Reviewer's report:
1. Is the question posed by the authors well defined?
Yes, the study aimed to identify the prevalence of dental erosion and to explore selected risk factors.

2. Are the methods appropriate and well described?
Discretionary Revisions
The manuscript’s organization could be improved by placing the information about the Guangdong province in the method section under the subtitle “Sample.” Additionally, the information regarding changes in the consumption of carbonated beverages in Guangdong could be introduced in the discussion section to better support the study’s findings.

We agree. The information regarding the Guangdong province has been placed in the Methods section under the subtitle, Sample. The information pertaining to changes in the consumption of carbonated beverages in Guangdong has been introduced in the Discussion section (see page 5, paragraph 4; page 16, paragraph 3).

Minor Essential Revisions
The study could be improved by including the number of examiners who participated in the study and by specifying whether or not they all visited the selected schools.

We agree. The study included two examiners and they all visited the selected schools. We have now added the sentence in red colour in the text (see page 8, paragraph 1, sentence 1).

3. Are the data sound?
Discretionary Revisions
Because they relate to the same issue, the information regarding “calibration of the examiners” and “reproductively” could be joined.

We agree. We have now moved the description regarding “duplicate examination” in the Clinical Examination section to the Calibration of the Examiners section (see page 7, paragraph 4).

Minor Essential Revisions
It appears that the data was gathered carefully; however, some variables require further specification, including “general health,” “swimming in summer,” and “medication intake” (page 8). Clarification will help the reader to understand the rationale behind labeling these variables tooth erosion risk factors.
We agree. We have now specified “general health” in the “Questionnaire” in red colour (see page 9, paragraph 2), and changed “medicine intake” to “vitamin C supplements” in the entire manuscript. We have explained why “swimming in summer” is one of the possible risk factors.

Also, insufficient information was given on inclusion and exclusion criteria for the children sample selection.

We agree. All of the children selected were 12-13 years old. Those who were with orthodontic appliances, enamel defects accompanied by loss of tooth substance, and fractured or missing teeth of the incisors or the first molars were excluded. This information was added in the Sample section and a related sentence in the Clinical Examination section was deleted (see page 6, paragraph 2).

4. Does the manuscript adhere to the relevant standards for reporting and data deposition?

Minor Essential Revisions

To complement the information on sample size calculation, the alpha and power levels should be mentioned.

We agree. According to the following formula of sample size for the estimation of prevalence, the sample size was 1444: 

$$n = \left( \frac{\mu_\alpha}{\delta} \right)^2 p(1-p)$$

(when $\alpha=0.05$, $\mu_\alpha=1.96; \ p$ was expected prevalence and was set to 0.21 according to the result of pilot survey; permissible error was set to be 10% and $\delta=0.1p$). In order to decrease sampling error, 1,500 children were proposed in our study. We have now complemented the alpha of sample size calculation in red colour in the text. This formula does not involve the power level (see page 6, paragraph 2, sentence 3).

As the method section illustrates, the authors attempted to produce a representative sample of Guangdong, which was a strength of the study. In the first stage, they included random samples of urban and rural districts. In the second stage, they selected two junior high schools through random sampling in each district. Based upon this sampling design, it appears that the authors have the information required to calculate the necessary weights and to estimate the province’s erosion prevalence. However, the text does not indicate that the sample design was taken into account during the data analysis. Due to this sample design, a statistical package like SUDAN or STATA could have been used to properly estimate standard error and confidence intervals.

We attempted to produce a representative sample of Guangzhou, which is the capital city of Guangdong Province. Guangzhou City has a population of approximately 10 million. We do not have the necessary data to calculate the weighted prevalence of the Guangdong Province that has a population of approximately 90 million.

Because the statistical packages, SUDAN or STATA, are not available here, the SPSS statistical package was used to analyze the data. We have calculated the
standard error \(\sqrt{\frac{p(1-p)}{n}}\) and confidence intervals \(p \pm Z_{\alpha} \sqrt{\frac{p(1-p)}{n}}\), according to the formulas.

The standard error of the prevalence was 0.012 and the 95% confidence interval was 25.0%-29.6%. We highlighted the information of the 95% confidence interval in the text in red colour (see page 10, paragraph 2, sentence 1).

**Under statistical analysis in the method section, the authors indicate that the variables at p<0.5 in the bivariate analysis enter the multivariate model. It is unclear whether this p value is correct.**

Some variables at p>0.05 in the bivariate analysis could be significant in multivariate analysis when taking other variables into account. Different studies set different p-values at the bivariate analysis to enter the multivariate analysis. For example, some studies included all the variables in the logistic regression model [1][2]. Another study included the variables at p<0.2 [3]. For our study, we included the variables at p<0.5.


**Discretionary Revisions**

The children studied were 12 to 13 years-old. It would be valuable to note any differences in tooth erosion prevalence by age.  
We agree. The tooth erosion prevalence by age is given (see page 10, paragraph 2, sentence 2).

Similarly, the study could consider differences in tooth erosion and main risk factors between rural and urban children.  
We agree. We calculated the prevalence of dental erosion in 4 urban districts (26.2%) and in 1 suburban district (28.9%). There was no significant difference between them \(P=0.087\). The sample size of children in suburban areas was relatively small (308). Thus, we only analyzed the risk factors for all the subjects as a whole (see page 10, paragraph 2, sentence 3).

5. Are the discussion and conclusions well balanced and adequately
supported by the data?

Minor Essential Revisions
In general, the discussion and conclusion are well balanced; however, there are some features that could be improved. In the first paragraphs of the discussion, the authors state that the erosion prevalence ranged from 13 to 95% based on the data in Table 2. However, the data in this table shows prevalence values from 11.6 to 100%, an anomaly that should be clarified.

We agree. We have now corrected it in the text in red colour (see page 13, paragraph 1, sentence 2).

In the last paragraph (page 10), the term “incidence” is mentioned, but the study did not measure incidence; it measured prevalence.

We agree. The term “incidence” in the Discussion section has been amended (see page 13, paragraph 2, sentence 5; page 14, paragraph 1, sentence 3).

Table 5 has a variable entitled “Amount of Acidic Drinks Intake.” The authors should clarify which drinks were included in this variable. For example, were carbonated drinks, lemon tea, and fruit juices included?

We agree. We have now added the information of acidic drinks intake included for “Amount of Acidic Drinks Intake” in the Questionnaire section (see page 9, paragraph 2, sentence 1).

Discretionary Revisions
The authors found an association between frequency of carbonated beverage consumption and dental erosion, using two categories (<once a week and #more than one a week). The researchers could perform a further breakdown of frequency of carbonated beverage consumption to better understand this association. This change would allow researchers to examine a potential dose response relationship, which could in turn strengthen the study’s results.

In our questionnaire, the frequency of acidic drink consumption was divided into four categories (as shown in table A). The number of children was generally small in the last two categories and the test efficacy was decreased. Thus, we combined the last three categories into one (more than once a week).
<table>
<thead>
<tr>
<th>Variables</th>
<th>Number of children without dental erosion (n=1083)</th>
<th>Number of children with dental erosion (n=416)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency of carbonated drinks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 1/week</td>
<td>693</td>
<td>243</td>
</tr>
<tr>
<td>1-3/week</td>
<td>258</td>
<td>112</td>
</tr>
<tr>
<td>4-6/week</td>
<td>87</td>
<td>35</td>
</tr>
<tr>
<td>≥1 /day</td>
<td>45</td>
<td>26</td>
</tr>
<tr>
<td>Frequency of sport drinks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 1/week</td>
<td>784</td>
<td>305</td>
</tr>
<tr>
<td>1-3/week</td>
<td>179</td>
<td>63</td>
</tr>
<tr>
<td>4-6/week</td>
<td>86</td>
<td>30</td>
</tr>
<tr>
<td>≥1 /day</td>
<td>34</td>
<td>18</td>
</tr>
<tr>
<td>Frequency of lemon tea</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 1/week</td>
<td>792</td>
<td>310</td>
</tr>
<tr>
<td>1-3/week</td>
<td>171</td>
<td>71</td>
</tr>
<tr>
<td>4-6/week</td>
<td>78</td>
<td>18</td>
</tr>
<tr>
<td>≥1 /day</td>
<td>42</td>
<td>17</td>
</tr>
<tr>
<td>Frequency of succade</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 1/week</td>
<td>846</td>
<td>314</td>
</tr>
<tr>
<td>1-3/week</td>
<td>139</td>
<td>53</td>
</tr>
<tr>
<td>4-6/week</td>
<td>64</td>
<td>36</td>
</tr>
<tr>
<td>≥1 /day</td>
<td>34</td>
<td>13</td>
</tr>
<tr>
<td>Frequency of fruits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 1/week</td>
<td>128</td>
<td>52</td>
</tr>
<tr>
<td>1-3/week</td>
<td>353</td>
<td>125</td>
</tr>
<tr>
<td>4-6/week</td>
<td>205</td>
<td>79</td>
</tr>
<tr>
<td>≥1 /day</td>
<td>397</td>
<td>160</td>
</tr>
<tr>
<td>Frequency of fruit juices</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 1/week</td>
<td>687</td>
<td>253</td>
</tr>
<tr>
<td>1-3/week</td>
<td>285</td>
<td>104</td>
</tr>
<tr>
<td>4-6/week</td>
<td>70</td>
<td>38</td>
</tr>
<tr>
<td>≥1 /day</td>
<td>41</td>
<td>21</td>
</tr>
<tr>
<td>Frequency of chewing gum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 1/week</td>
<td>584</td>
<td>233</td>
</tr>
<tr>
<td>1-3/week</td>
<td>276</td>
<td>100</td>
</tr>
<tr>
<td>4-6 /week</td>
<td>132</td>
<td>43</td>
</tr>
<tr>
<td>≥1 /day</td>
<td>91</td>
<td>40</td>
</tr>
</tbody>
</table>
The study provided interesting results, including the high prevalence of dental erosion; additionally, the researchers found an unusual pattern of tooth erosion in the studied Chinese children. This pattern showed high involvement of the lower incisors, a finding not analyzed in other studies. It would be beneficial to discuss the possible reasons for this finding.

We agree. The possible reasons for high involvement of the lower incisors have been discussed in the Discussion section (see page 13, paragraph 2).

The last paragraph on page 12 indicates that no significant difference was found in beverage consumption between boys and girls. The authors provide the duration of time that teeth came in contact with acidic beverages, using p values. Though this information is not given in the results section, it should be included. In the discussion section, the authors explain the higher prevalence of erosion among girls compared with boys by attributing it to a difference in duration of acidic beverage in the mouth. Additionally, the results in Table 5 indicated no association between method of drinking and dental erosion. The authors should clarify this issue.

We agree. We have now added analyses on the consumption of drinks and food, and special drinking habits by gender and amended the discussion on this issue (see page 12, paragraph 2; page 16, paragraph 1).

6. Are limitations of the work clearly stated?

Discretionary Revisions
It would improve the paper if the authors included more information on the limitations of the study: problems with the choice of index, design of the study, measurement of risk factors, etc.

We agree. We have now added a paragraph in the Discussion section in red colour (see page 17, paragraph 2).

7. Do the authors clearly acknowledge any work upon which they are building both published and unpublished?

Discretionary Revisions
There are a few paragraphs that would benefit from references, including the second paragraph on page 13.

We agree. We have now added the references in the text in red colour (see page 3, paragraph 3, numbers 2 and 3; page 6, paragraphs 1 and 2, number 5; page 13, paragraph 2, number 13,14 and 15; page 17, paragraph 1, numbers 28).
8. Do the title and abstract accurately convey what has been found?
Minor Essential Revisions
The abstract indicates that the teeth most frequently affected by dental erosion were the central incisors (14.8–17.4%), but no specification between upper or lower incisors is given. In the results section of the manuscript (Figure 1), it is shown that the prevalence in the upper incisors was 16.3 and 15.9%. Since the prevalence of lower and upper incisors was similar, it would be appropriate to provide the data for both upper and lower incisors in the abstract.

We agree. We have now given the data for both the upper and lower incisors in the abstract in red colour (see page 2, paragraph 3).

9. Is the writing acceptable?
Minor Essential Revisions
In general, the writing is acceptable, but there are some mistakes. The authors should correct the titles of Table 1, Table 2, and Table 5. Additionally, there is a spelling mistake in the last paragraph on page 6.

We agree. We have now corrected the mistakes in the text in red colour (see pages 23, 24, and 27; page 6, paragraph 2).

Discretionary Revisions
A general review of the syntax would be useful.
Quality of written English: Needs some language corrections before being Published

We agree. We have copyedited the paper using a professional copyediting service provided by International Science Editing to improve the style of the written English.