Reviewer's report

Title: Calcium and magnesium in drinking water and diet as cardiovascular risk factors in individuals living in hard and soft water areas with differences in cardiovascular mortality. A cohort study.

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Reviewer: Marie-Pierre P SAUVANT

Level of interest: A paper whose findings are important to those with closely related research interests

Advice on publication: Unable to decide on acceptance or rejection until the authors have responded to the compulsory revisions

Compulsory revisions:

1 - This manuscript is about the relationship between Ca and Mg levels in drinking water and diet, and the main biological cardiovascular risk factors. It does not evaluate the Ca and Mg elements as cardiovascular risk factors. This notion must be seen in the title, as it is mentioned in the last sentences of the Background part.

=> Proposition: "Relationship of calcium and magnesium in drinking water and diet, and cardiovascular risk factors, in individuals living in hard and soft water areas with differences in cardiovascular mortality."

2 - In the Background part, the authors could mention a recent review paper, which discussed the role of water hardness in cardiovascular disease, under epidemiological and toxicological point-of-view.


3 - In the Background part, it is a sentence that I don't understand:

"Previous studies use aggregated data and on a population level and on individuals".

Do the authors think:
"Previous studies use aggregated data at population level and not at individual level"?

4 - In the Results part:

4-1 I would begin the Results part with the description of the cohort. These data are mentioned in page 5 ("Age and gender were similar in groups ... with the mortality rates higher in the western community" + Tables 5, 6, 7).

Under an statistical point-of-view, the comparison of experimental data is more pertinent if both populations are similar in terms of demographic and life-style characteristics.
4-2 It is known that U-Mg is dependent of the intake and excretion of proteins in humans. So, it is better to use the ratio "U-Mg/U-creatinine" (or "U-Mg/U-urea") at the individual level to study the elimination of Mg, according to the intake. (This ratio is a constant in human). The correlations presented in Tables 2 and 3 could be more significant? For more information, see: Durlach J., Bara M.: Le magnesium en biologie et en médecine" EM Inter eds, Paris, 2000, 398p.

4-3 The calcium in water represents only 0.9% of Ca intake in West areas and 4.2% in East areas (calculations from data of Table 4a), which are weak percents comparatively to diet. This point is important to highlight and it is well describe in this study. But, how do the author explain the correlation of calcium in water and SBP, and the absence of correlation between calcium in diet and SBP or other cardiovascular risk factor?

5 - In the Discussion part:
5-1 There are several repetitions of Results data in the Discussion part, that could be eliminated. This part must be rewritten and restructured. It would be more interesting, that the authors mention their opinions / comments about the biological significance of the correlation observed between Ca or Mg and/or cardiovascular risk factors.

5-2 Moreover, several epidemiological studies have shown that inverse significant correlation between the hardness of water and cardiovascular mortality are linked to the Mg element, which is the main ion in water, or with the ratio Mg/Ca in water. No significant relationship has been mentioned in studies, for which hard water did not bring more Mg that soft water.

In the study of Nerbrand et al's, the ratio Mg/Ca are very similar in both areas (Mg/Ca = 4.1/66 = 0.06 in East areas and Mg/Ca = 0.74/8.8 = 0.08 in West areas). This no-discriminant point could explain the absence of correlation observed with many cardiovascular risk factors. What are the opinions of the authors?

5-3 There are some references in the Discussion part that could be put in the References list.

6 Is it the right place for the Methods part? (I am not familiar with the journal Public Health). Moreover, there are some references in the Methods part that could be put in the References list.

7- The conclusion must be completed. The critical point must be the role of drinking water in the intake of Ca and Mg, and the role of these elements on the cardiovascular risk factors. For more data about the contribution of drinking water to Ca and Mg intake in human, the authors can see:


Competing interests:
None declared.