Reviewer’s report

Title: Weather conditions and Bell's palsy: Five - year study and review of the literature

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Reviewer: Prof E Stennert

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

Advice on publication: Accept after revision, which I do not need to see

In their study Danielidis and his co-workers studied the influence of 13 meteorological parameters on the incidence of Bell's palsy in the prefecture of Ioannina. Using chi-square tests from 13 contingency tables the authors showed that the 13 measured parameters did not have an effect on the incidence of Bell's palsy. Additionally, using a Cluster Analysis 8 weather types were created. The authors showed that the weather type had no correlation to the incidence of Bell's palsy.

Using an adequate statistic model the conclusions drawn by the authors are clear: The analyzed parameters do not have any effect on the incidence of Bell's palsy in Ioannina. Therefore, the authors should repeated their results in the abstract (page 3) in correct words: "Meteorological condition changes seem to have no effect on the incidence of Bell's palsy in Ioannina. Due the examined collective of patients the authors should only draw conclusions for the examined geographical area.

In the Material and methods (page 5-9) some important information is missing. Most important, did the authors perform an prospective or retrospective analysis? If a prospective analysis was done, how did they get the information to fulfill their exclusion criteria (page 6)? Using the mentioned examinations (page 6) it is, par example, not possible to exclude a neoplastic disease as reason for the patient's facial palsy.

The authors should mention how many of the 171 cases were excluded from the study. In other words, how many patients were really analyzed?

Another critical point are the criteria of an underlying infection. First, the authors should give a more detailed description of their criteria for an "infection", Second, even using a defined threshold for the mentioned parameters (laboratory tests, virological tests etc.) an "infection" may not be excluded with certainty. In this connection, it would be interest to know, how many patients had an "infection". A critical comment on this fact is missing in the Discussion.
The most critical point is the day of onset. At least, the authors do not know the day of onset. They only know the day of diagnosis with certainty. Even, in confidence of the patient's opinion of the onset of the palsy, we do not if the same day really was the day that started the palsy. Hypothesizing that weather conditions play a role for Bell's palsy, isn't it more probable that the weather conditions of the day before the onset of symptoms is the important day? Or perhaps two days before? The authors should give a comment on this problem in the Discussion.

The authors should also give a comment on a statistical problem: How representative is the examined cohort for the Ioannina area? What proportion of all Bell's palsies is seen in the ENT Department of the University? How many are seen in outpatient clinics or by neurologists?

At least, a minor point: The authors should give a citation for the climate data of Ioannina (page 5, last paragraph). Additionally, they should assure that the climate is equal in the total area of Ioannina.

The paper should be published in BMC Otolaryngology instead of BMC Neurology.

**Competing interests:**

None declared.