Demonstration of Statistically Significant Correlations between 8 and 12 kHz Atmosferics and Sudden Deafness

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Sudden Deafness, Atmosferics

In the last few years we have shown that atmosferics of different frequencies correlate with the onset of epileptic fits, heart infarcts and with the intensity of an inflammation reaction in rats. Now we show that sudden deafnesses are related (multiple $R^2 = 0.08$) with the onset of 12 kHz in the first part of the day before the sudden deafness and the absence of 8 kHz in the first part of the day of this event.

The investigation of relations between weather and diseases has a long history [1, 2]. However, the correlations found between the so called classical parameters such as temperature, humidity et cetera have always been relatively low in comparison with the fact of a clear cut accumulation of certain diseases on certain days [3, 4]. In the last two years, however, we found in part remarkably high correlations with epileptic fits [5], heart infarct [6], the intensity of inflammation reaction [7] on the one hand and atmosferics on the other hand. Atmosferics are electromagnetic alternating oscillations in the range between 5 and 50 kHz derived from certain air mass movements within the troposfere [8]. Now we will describe a further case of such a relation: sudden deafness (SD) and 12 kHz rates in the first part of the day before the SD and the absence of 8 kHz in the first part of the day of SD.

Material and Methods

1. Patients

We evaluated more than 500 cases of SD of 5 otorhinolaryngology clinics in Munich in 1984.

To make sure we chose only cases with a sudden beginning and with a clinical confirmation of an SD after a detailed examination [10] from this number. Furthermore we took only cases where at least the day of the beginning of the SD was unequivocally known. Using these criteria 203 cases remained. The SD occurred on 155 days of the year; 113 days had one SD and only 4 days had more than two SD. Therefore we divided the material into one group with one or more SD a day and a second group with no SD.

2. Electrical measurement techniques

We measured the atmosferics by means of two 7-element ferrite antennas with preamplifiers, installed 17 meters above ground level. The received signals were conducted by coaxial cables to the measuring and recording instrumentation. Impulses were detectable within approximately 500–600 km around the receiving station. Ionosferic reflections play no role when using this arrangement; measurements were compared principally with ground wave propagation. Even so, the input sensitivity of the installation was automatically tuned to and calibrated by a high stability subsidiary transmitter 350 km away in order to minimize transhorizontal propagation. To produce a wide band magnetic antenna the self resonance of the 10 kHz antenna was electronically enhanced. The incoming impulses were sorted into appropriate channels on the basis of their measured frequencies. Using digital filtering, the bandwidths were closely defined 8 kHz ± 500 Hz, 10 kHz ± 700 Hz, 12 kHz ± 500 Hz and 28 kHz (+1.5 kHz, −3 kHz), appropriate to the energy distribution of the frequency spectrum of atmosferics. Moreover each signal was automatically checked for having a sine wave form with a definite beginning and end. By this non-sine-wave signals and technics could be disregarded. Similarly, electromagnetic impulses from exponential discharges (EMP) were not re-

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corded. Impulses or groups of impulses selected in this way and summarized every 8.3 min (7.2 time units/h) were counted. In addition to this the pulse-rates of the incoming atmosferics were classified in all of the far frequencies and for each time unit in three steps and then recorded on tape: the first step corresponded to a low, the second to an average impulse activity, and the third step of pulse-rate was defined by the frequency of 2.5 Hz or more for the atmosferics of 4, 6, 8, 10, 12, 28 and 50 kHz. For the 12 kHz atmosferics the third step was defined by 0.25 Hz. The impulses of the single frequencies were summarized daily in three time groups: 0–8 h, 8–16 h and 16–24 h.

Looking at the distribution of each frequency separately in all three line intervals we defined new categorized variables for all ($7 \times 3 = 21$) frequencies: the 25% most extreme values were summarized to the category "deviation from normal frequency" and the middle 75% of values to the category "normal frequency".

Results and Discussion

First we tested the hypotheses that the occurrence of SD is independent on the onset of particular frequencies on the same and preceding day. Separately for the daily time groups, fourfold tables with the appropriate χ^2-test were calculated for all the 7 measured frequencies.

With an error probability of less than 1% we can reject the hypothesis of independence for the frequencies of

a) 12 kHz (time group 0–8) of the day before the SD and

b) 8 kHz (time group 0–8) of the day of the SD.

On the basis of $p < 0.05$ we can add the following frequency:

c) 12 kHz (time group 0–8) of the day of the SD.

Thus, the more frequent deviation of the 12 kHz atmosferic impulses the more often the occurrence of SD whereas the opposite is true for 8 kHz.

For evaluating simultaneously the influence of several atmosferics frequencies on SD we fit multiple linear regression models. We started with a model containing the nine variables with the strongest simple relations. Then we stepped backward by omitting respectively the frequency with the lowest influence ($p < 0.05$) on the SD. The starting model with the nine variables explains 8.7% of the variance of SD. In the final model the two variables remained: the negative influence of the 8 kHz atmosferics of 0–8 h of the day of the SD and the positive influence of the 12 kHz atmosferics of 0–8 h of the day before this event. These two frequencies are the best predictors of a SD with the multiple correlation of 0.23 ($p < 0.01$).

The three studies of relations between atmosferics and diseases mentioned in the introduction always occurred on the day of observation. In this new case the correlation occur in the time interval 0–8 of the day before and the day of the onset of hearing loss. There seems to be a kind of memory of the influence of atmosferics lasting for 1–2 days. This may be important for the explanation of the mechanism of the influence of atmosferics on organisms.

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