Fig. 2 (abstract P166). See text for description.

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Characterization of the spectral content of resting-state electroencephalographic activity in chronic migraine female patients

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Objective. Previous studies have reported neurophysiological differences between chronic migraine (CM) and healthy controls (HC). The aim of the current study is to evaluate how the CM condition affects the brain activity in women using spectral measures.

Methods. We have included 62 female subjects: 32 CM patients (age 34.50 (27.50, 39.00)) and 30 HC subjects (age 29.00 (26.00, 35.00)). Ten minutes of eyes-closed resting-state electroencephalographic (rsEEG) activity were acquired using a Brain Vision® equipment. The power spectral density (PSD) of rsEEG recordings was computed to assess the spectral content of the brain electrical activity. Nine spectral parameters were computed from the PSD: individual alpha frequency, transition frequency, median frequency (MF), spectral edge frequency, relative power (RP) in the conventional frequency bands, spectral entropy, Rényi entropy, Tsallis entropy, and Escort-Tsallis entropy.

Results. Statistically significant differences ($p < 0.05$, Mann-Whitney U-test) were found in the spectral content of PSD in terms of MF, and RP in beta 1 and beta 2 frequency bands. In addition, PSD irregularity, assessed by means of spectral entropy, Tsallis entropy, and Rényi entropy, showed differences between both groups. Furthermore, CM patients exhibited significantly higher values for MF, RP in beta 1 and beta 2 bands, spectral entropy, Tsallis entropy, and Rényi entropy than HC subjects, which suggests that CM induces an increase in the oscillatory activity in high-frequency bands and irregularity in rsEEG activity.

Conclusions. Our analyses showed that CM is associated with an increase in both high-frequency oscillatory activity and irregularity in rsEEG activity compared with HC. These findings could be exploited to provide further understanding on CM.

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Impact of air pollution exposure on headache onset in migraine patients

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Question: Air pollution has a clear impact on people health"s increasing the risk of suffering from several diseases. We aimed to analyze whether if ambient air pollution triggers migraine attacks

Methods: This is a prospective longitudinal study. Headache daily status (headache free vs headache day) and GPS coordinates were collected using a custom-developed Smartphone App. Patients with migraine diagnosis seen in the Headache Clinic were recruited. Daily maximum 1-hour nitric oxide (NO), carbon monoxide (CO), sulfur dioxide (SO2), fine particulate matter (PM10) and ozone (O3) levels in the previous four days before headache onset were considered as possible explanatory variables for a binary outcome variable describing the potential daily headache status. A mixed-effects logistic regression model was performed. The model was adjusted by patient characteristics at baseline and meteorological parameters (daily mean temperature, relative humidity, accumulated precipitation, radiation and wind speed levels). It was validated using repeated 10-fold cross-validation.

Results: Sixty-six patients (80.3% women, mean age 48.7±9.2 years) contributed to 12,233 days of data, from which 1,668 days (13.6%) were headache days. Statistically significant differences in levels of daily maximum 1-hour NO (p=0.041), SO2 (p=0.010) and O3 (p= 0.010) were found over the previous four days before headache onset. An increase in daily maximum 1-hour levels of NO2 of 35 μg/m³ (0.5·IQR, Interquartile Range) in the previous 48 hours was found to increase a 5.6% the probability of a headache onset (p=0.035). The presence of an attack on previous days was also associated with potential headache risk.

Conclusions: Headache onset in migraine patients might be influenced by greater air pollution on previous days. Air pollution, combined with other external and individual internal factors, has an impact on health status and might contribute to triggering migraine attacks.

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A Cohort Study Comparing Melatonin-users with Non-users in the treatment of Migraine Headaches

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Question
Melatonin improves sleep quality and severity of headaches, when compared to baseline studies. It is a safe drug with minimal side effects and is well tolerated. This research will further highlight the potential of Melatonin for treatment of migraine headaches.

Method
A cross sectional study was performed on 120 participants in a hospital setting where the users and non-users of Melatonin were divided into groups of 60 each. A MIDAS (Migraine Disability Assessment Scale) questionnaire was used to assess the symptoms. To establish a correlation between different factors, the chi-square test and p-value were used. A null hypothesis was formulated with no association taken into account, and the chi-square and p-values were computed to find possible association between the considered factors. The confidence interval for p-value was taken at 95% with a 0.05 level of significance.

Results
It was found that there was a reduction in the intensity of pain and improvement in quality of sleep in the Melatonin user against the non-user cohort with an average age of 30, as evident from the results of chi square and p value of 7.5481 and 0.006007 for number of night time awakenings (relative risk reduction= 0.539 and number needed to treat= 4.291) and chi-square value of 36 and p-value of 0.00001 for intensity of pain reduction (relative risk reduction= 0.473, number needed to treat=1.897). The values for mean frequency headache reduction went down from 3.23±0.26 in the non-user cohort to 2.1±0.67 in the user cohort.