Risk of chronic and episodic migraine in women: correlation between epigenetics and brain activity

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INTRODUCTION:

Migraine is a neurological condition of great socio-economic impact due to its prevalence (12% in Spain and Portugal) and incapacitating nature.
The social challenge to improve the quality of life of these patients is of paramount importance, especially for women, the population most affected by migraine (75% of cases).

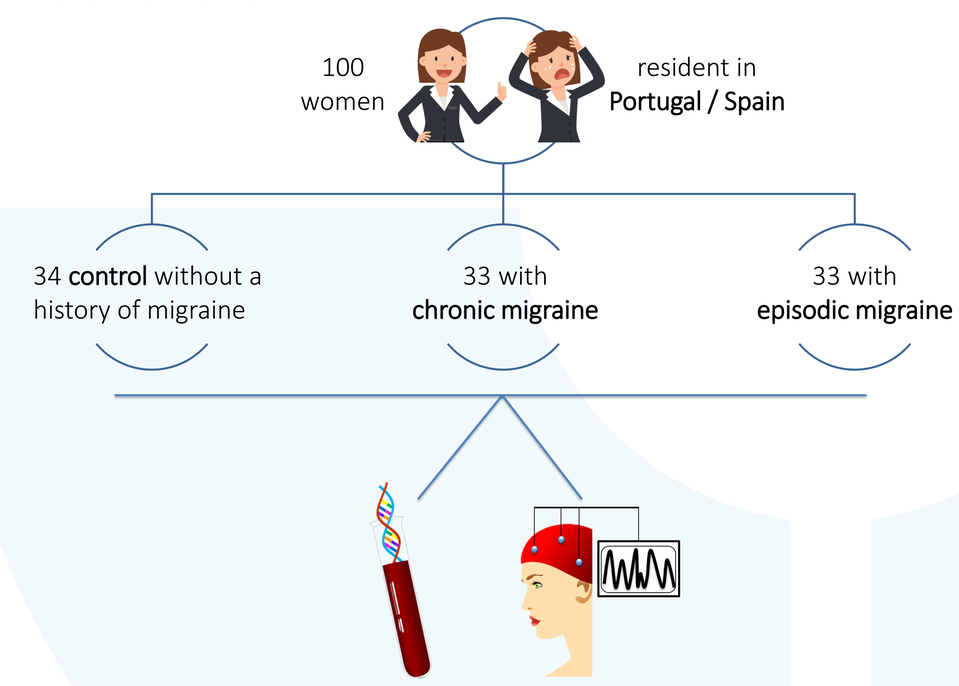
Migraine is divided into two broad sub-types, Episodic and Chronic.
Chronic migraine is defined as "headaches on at least 15 days per month for at least 3 months, with the features of migraine on at least 8 days per month".
While **Episodic migraine** is 14 or fewer headache days per month.

Although several studies focused on the genetics of migraine, there is scarce research on epigenetic factors or how this disease affects brain activity.

OBJECTIVE:

The overall **aim** of this project is to generate new synergies aiming at a network of interdisciplinary and transnational cooperation to analyze epigenetic and neuronal factors in order to develop migraine biomarkers in women.

SUBJECTS:



ACKNOWLEDGEMENTS:

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RESEARCH PLAN:

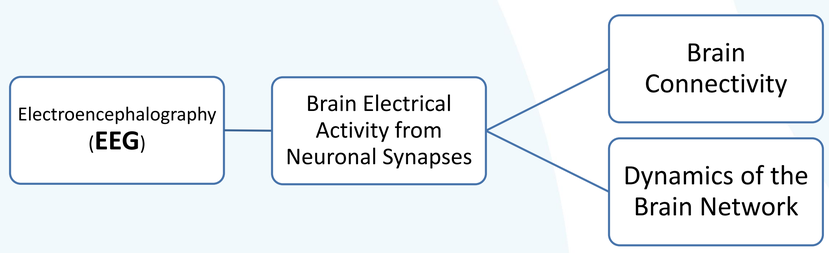
Epigenetic Analysis

X-inactivation

Given the higher prevalence of migraines in women, we intent:
a) to analyze in detail the **methylation levels of the CpG islands of the X chromosome genes** that show greater differences between cases and controls in the WGBS analysis and that are also expressed in brain tissue.

b) to correlate the methylation levels with the level of gene expression using mRNA extracted from blood samples from patients with greater variability and controls.

Brain Activity analysis



Meta-analysis

Epigenome-EEG Correlation

We intent to identify patterns by means of meta-analysis, providing assistance in the diagnosis of migraine.
This will be carried out combining EEG signals and epigenetic data from all the participants in the study.

Different association studies will be applied:
- Control individuals vs patients (chronic and episodic migraine)
- Control individuals vs patients with chronic migraine.
- Control individuals vs patients with episodic migraine.
- Patients with chronic migraine vs patients with episodic migraine.

CONCLUSION:

To design of a tool to help in migraine's diagnosis and individualized treatment.

This tool will be constructed from a database with epigenetic, cerebral and clinical information of the patients studied.

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