

Environmental and genetic factors in pediatric multiple sclerosis (PEDIGREE Study)

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Background: Pediatric multiple sclerosis (PedMS) is a privileged condition to explore the mechanisms involved in MS development as close to exposure to etiological factors, with the possibility to study their role with respect to genetic background. The PEDIGREE study has been developed to explore the genetic architecture and the interaction between genes and environment predisposing to pediatric multiple sclerosis pedMS in a large Italian cohort.

Material and methods: the study is supported by FISM. The objectives are: a) to collect a cohort of PedMS patients (cohort-a) and healthy controls and to identify genetic risk factors associated with PedMS. A cohort of adult MS patients with onset before 18 years will also be included for the only genetic study (cohort-b). In particular we will i) measure the genetic burden of pediatric-onset; ii) identify genetic variants associated with the risk of PedMS by means of case-control association study at genome-wide and mitochondrial DNA levels; iii) evaluate the familial aggregation of the disease in PedMS. b) to identify the environmental factors associated with PedMS such as exposure to passive/active cigarette smoking, sunlight, vitamin D supplementation, early life nutrition, increased body mass index, poor physical activity, childhood infections, and vaccinations on the risk of MS. The exposure to environmental factors will be assessed by means of a modified version of an existing Questionnaire designed English. c) to explore gene-environment interactions associated with PedMS e) to explore the role of gut microbial in PedMS. f) to compare the gut microbial community profiles in incident cases of PedMS and control children matched for age and sex.

Results :

The project has been initiated in February 2018, 28 Italian MS have obtained the approval of their own EC and since February 2020 are actively involved in the study. At present: 1. the questionnaire has been translated Italian, 2. A pilot study including > 50 healthy subjects < 18 years is ongoing to evaluate the feasibility of the questionnaire, 3. participating centers have identified cases according to inclusion criteria for cohort-a and -b.

Conclusions: this study, coordinating a large number of MS centers involved in the management of pediatric MS, will provide information on the role of environmental and genetic factors in the development of MS. At the time of the presentation, data will be provided on the validation of the questionnaire.

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