Regional Grey Matter Atrophy is associated with Social Cognition impairment in Progressive Multiple Sclerosis (MS).
Tomas Labbe(1), Ethel Ciampi(2), Juan Pablo Cruz(3), Macarena Vásquez-Torres(2), Claudia Cárcamo(2).

(1) Centro Interdisciplinario de Neurociencias, Facultad de Medicina, Pontificia Universidad Católica de Chile
(2) Centro de Esclerosis Múltiple, Facultad de medicina, Pontificia Universidad Católica de Chile
(3) Departamento de Radiología, Facultad de Medicina, Pontificia Universidad Católica de Chile

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Focal White and Grey Matter Damage in MS.

Myelin and Axonal loss generates brain damage and disability in young patients (During Critical Periods for Family and Work)
Cognitive Impairment

40-70% of MS Patients Exhibit some Cognitive Impairment

Most Commonly:
Working Memory, Processing Speed, Episodic Memory and Executive Functions.

SOCIAL COGNITION:
Decoding emotions in faces, inferring mental states, empathy.

Socio Cognitive Compromise Still Undefined

UNDEFINED
Disability and Costs.

Early Intervention in MS

Modifies the disability’s curve and the associated costs.

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Objective

- Identify Brain regions which volume is related to Social Cognition Performance in Multiple Sclerosis.
Materials & Methods

- **34** Patients with Progressive MS were included.
- **Neuropsychological evaluation**: PASAT (Working Memory), SDMT (Processing Speed) and MiniSEA: Mini-Social-and-Emotional-Assessment test, including Social Perception and Theory of Mind Test.
- **Brain MRI** was acquired using a Philips Ingenia 1.5T, including volumetric 3D-T1W and T2-FLAIR images.
- Lesion filling was performed using Lesion segmentation tool within the **SPM (Statistical Parametric Mapping)** software.
Face Emotion Recognition and Theory of Mind abilities will be studied and correlated to brain structure.
Voxel Based Morphometry

SAGITAL T1 3D Images were Analyzed in order to identify brain regions which volume is related to performance in tasks that evaluate specific functions.
Results: Gender Differences.

- Voxels with higher grey matter density in women compared to men.
Results: COGNITIVE PERFORMANCE

Voxels in which grey matter density is significantly related to conventional cognitive test. We obtained a traditional localization of brain functions.

INTERNAL CONTROL
Results: SOCIAL COGNITION

THEORY OF MIND
(a)

SOCIAL PERCEPTION
(b)

(a) Right Fusiform Gyrus, Bilateral Cingulate Cortex and Insula.
(b) Left Cingulate and Frontal Lobe.
CONCLUSIONS

• MRI identifies Social Cognition impairment as an independent issue in MS and provides a neural substrate.

• *Fusiform Gyrus, Cingulate Cortex and Insula* volume are related to Social Perception Performance.

• *Left Cingulate and inferior Frontal Gyrus* are related to Theory of Mind impairment.
References