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Università di Roma Tor Vergata
Università degli Studi di Roma "Tor Vergata"

# Emotional recognition in MS: neural correlates in RR and SP patients.

*Argento O., Spanò B., Incerti C.C., Bozzali M., Caltagirone C., Francia A., Fratino M., Nocentini U., Quartuccio E., Serra L., Pisani V.*

## *Background*

**Recent studies evidenced difficulties in emotional processing and social cognition in MS patients (pMS) which are important for social adaptation. Aim of this study was to explore the neural correlates of emotional recognition in pMS with RR and SP course by the "Reading the mind in the eyes" (RmE-test; Figure 1).**

*Table 1.Demographics*

| | Sex (M/F) | Age Mean (SD) | Range | RR/SP |
|---|---|---|---|---|
| pMS | 19/24 | 43,5 (10,4) | 24-65 | 27/16 |
| HC | 9/14 | 40 (12,0) | 22-61 | / |

*Table 2. Between and Whithin group comparison of REMt scores*

| | HC | pMS | Sig. |
|---|---|---|---|
| RmE_Corr | 0.115 (± .70) | -0.354 (± .93) | *.025** |

| | HC | pMS_RR | pMS_SP | Contrast | Sig. |
|---|---|---|---|---|---|
| RmE_Corr | .115 (± .70) | -.221 (± .83) | -.579 (± 1.1) | HC/ pMS_RR | .513 |
| | | | | HC/ pMS_SP | *.046** |
| | | | | pMS_RR/ pMS_SP | .565 |

## *Matherials and Method*

**43 pMS (27_RR; 16_SP) and 25 age- and sex-matched controls (HC) performed a clinical assessments, the RmE-test and 3T-MRI. For each participant, a high-resolution T1-weighted magnetisation prepared rapid gradient echo (MPRAGE) sequence was acquired. RmE-test was composed by 36-stimuli with 4-forced choice answer options each. The number of correct answers was collected and compared between groups.**
**Two separate correlation analyses using VBM were employed to assess the potential relationship between RmE scores and GM in HC and pMS. Statistical threshold was set to p-FWE-corrected<0.05 at cluster-level.**

*Figure 1. An example of the RmE test trial*


## *Results*

**pMS showed a significantly lower performance on RmE-test compared to HC (p=.025), with pMS_SP performing significantly worse than HC (p=.046; Figure 2). GM was found directly correlated with RmE bilaterally in: amygdala, caudate nucleus, putamen, insular and cingulated cortex, hippocampus, parahippocampal, parietal and occipital cortex, on the right in temporal cortex, and cerebellum (Figure 3). This correlation was found in pMS (significantly more in SP than RR) but not in HC.**

*Figure 2. statistical significance at ANOVA with Bonferroni correction.*

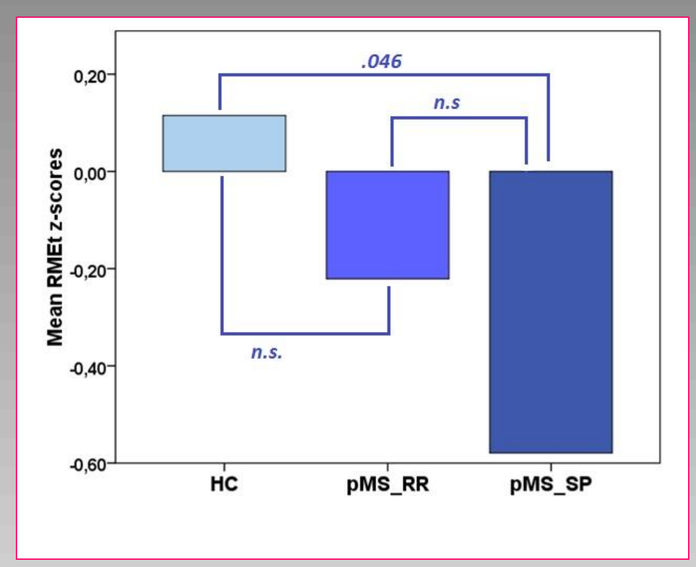
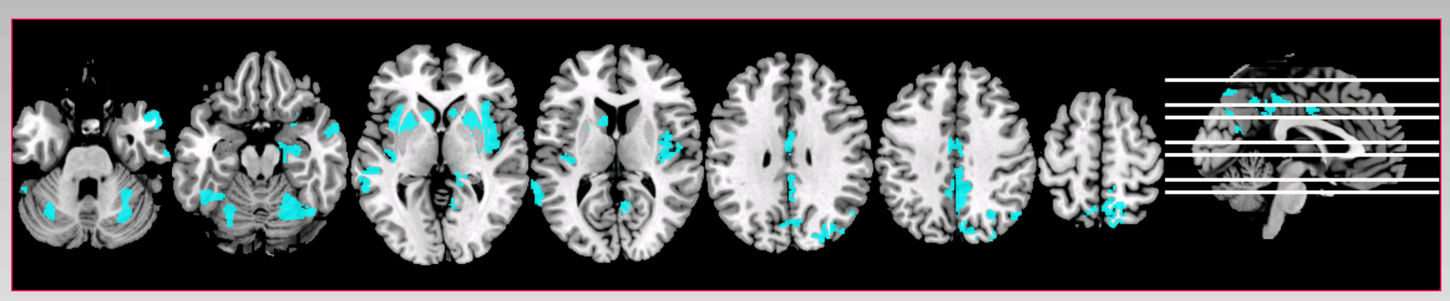



*Figure 3. Significant clusters between pMS and HC.*



## *Discussion and Conclusions*

**pMS have found significantly more difficult to recognize the others' emotional mental states expressed in by the eyes without the support of other facial features: this seems to correlate with GM atrophy in specific brain regions. The actual results advance the knowledge of the anatomical correlates of social cognition processes in MS patients. Future studies could clarify the relationships with other cognitive dysfunctions**