

Behavioral and brain changes related to mindreading in presymptomatic C9ORF72 carriers

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State of the art

The few studies investigating social abilities in presymptomatic C9ORF72 carriers' subjects highlighted contradictory results. The aim of this study was to investigate behavioral and brain changes of mindreading abilities in the presymptomatic phase of frontotemporal dementia.

Methodology

According to their genetic profile, individuals related to patients carrying the C9ORF72 gene mutation were divided into 20 carriers (C9+) and 18 non-carriers (C9-) of the mutation. Participants carried out a 40 items task-based functional MRI assessing the ability to attribute affective mental states. The task consisted in determining the mental state felt by a protagonist involved in social situations presented in video clips; among embarrassment, pride or neutrality.

Results

The C9+ compared to the C9- group had weaker performance for affective inference characterized by a more frequent attribution of neutral states for emotional situations, whereas neutral situations were correctly detected. In both groups, the medial prefrontal cortex was significantly more activated in emotional conditions than in neutral ones. In addition, significant activations were observed in the temporoparietal junction, precuneus, hippocampus and temporal pole in the C9+ group.

Conclusion

Our results highlighted subtle but early changes in the inference of affective mental states in presymptomatic C9ORF72 carriers. In the C9+ group, the more widespread brain network involving regions classically reported in mindreading studies could be the result of a greater cognitive cost leading to a potential compensation phenomenon at the brain level.

Conflicts of interest

N/A