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Cerebral response to auditory attractiveness and auditory hallucinations in schizophrenia: An fMRI study for understanding social cognitive function

Michihiko Koeda

Nippon Medical School, Japan

Greeting conversations are essential tools for communicating socially with family, friends, and community. Attractiveness is one of the favorable behaviors associated with social communication. A recent study showed that the roles of inferior frontal gyrus (IFG) and superior temporal gyrus (STG) are essential for perceiving auditory attractiveness. However, to our knowledge, no study has ever investigated the cerebral response to auditory attractiveness in schizophrenia. We aimed to clarify the cerebral function underlying the perception of auditory attractiveness in schizophrenia patients. Cerebral activation was examined in 18 schizophrenia patients and 18 controls when performing Favorability Judgment Task (FJT) and Gender Differentiation Task (GDT) for pairs of greetings using event-related functional MRI. Full-factorial analysis revealed that the main effect of task was associated with activation of left IFG and STG. The main effect of Group revealed less activation of left STG in schizophrenia compared with controls, whereas significantly greater activation in schizophrenia than in controls was revealed at left middle frontal gyrus (MFG), right temporo-parietal junction (TPJ), right occipital lobe, and right amygdala ($p < 0.05$, FDR-corrected). A significant positive correlation was observed at right TPJ and right MFG between cerebral activation under FJT minus GDT contrast and the score of hallucinatory behavior on the Positive and Negative Symptom Scale. Findings of hypoactivation in left STG could indicate brain dysfunction in accessing vocal attractiveness in schizophrenia, whereas hyperactivation in right TPJ and MFG may reflect the process of mentalizing other person's behavior by auditory hallucination by abnormality of cognitive bias.

Biography

Michihiko Koeda is a senior assistant professor of the psychiatry department at Nippon Medical School, Tokyo, Japan. He completed his PhD at the Medical Research Institute of Tokyo Medical and Dental University. He was a visiting researcher at the University of Glasgow. He is continuing to investigate auditory brain function by the use of functional MRI to clarify the pathophysiology of psychiatric symptoms, and pharmacological and/or genetic effects.

mkoeda@nms.ac.jp

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