

Evaluation of Cerebral Cortices Associated with Sexual Arousal in Healthy Male Using BOLD-based Functional MRI

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목적 : The purpose of this study was to identify cerebral cortices related with sexual arousal from visual sexual stimulation in healthy males using BOLD-based functional MR imaging.

대상 및 방법 : Sixteen male volunteers with sexually potent(mean age:24) were examined for this study. Functional MRI was performed on a 1.5T MR scanner(GE Signa Horizon) with birdcage-type head coil. In this study, blood oxygenation level dependent(BOLD) technique was utilized to create fMR image reflecting local brain activities. The BOLD-based fMRI d were obtained from 7 oblique planes using gradient-echo EPI with 90° flip angle, 50ms TE 6000ms TR, 26 cm × 26 cm FOV, 128 × 128 matrix, and 10mm slice thickness. The sexual stimulation paradigm consisted of two alternating periods of rest and activation and it began with a 1 minute rest, followed by a 2 minute stimulation by a documentary a erotic video film. Brain activation maps were generated by cross-correlation of images acquired during rest and activation periods. The index of activation was used to compare the number of pixels activated by each task in each volunteer, where the significance of the differences was evaluated by using Students t-test.

결과 : During the visual stimulation in fMRI, occipital lobe was activated by either an erotic non-erotic film. However, erotic film gave 1.5-2.0 times stronger activation. More than 10 of 16 healthy subjects were significantly activated in the areas of inferior frontal gyrus, cingulate gyrus, insula cortex, corpus callosum, thalamus, caudate nucleus, globus pallidus, putamen, and inferior temporal gyrus by erotic stimulation. With the erotic visual stimulation, inferior temporal gyrus was activated symmetrically in both hemispheres of all subjects. Thalamus was activated bilaterally in 12 of the 16 subjects. The basal ganglia, such as caudate nucleus globus pallidus and putamen, were weakly activated compared to other areas. Paralimbic areas such as inferior frontal gyrus, insula cortex, and corpus callosum were activated at least 11 out of the 16 subjects. The cingulate gyrus was activated in 12 out of 16 subjects, where 9 subjects showed anterior activation and 10 subjects were in the posterior part. The intensity of activation was highest in the inferior temporal lobe and was lowest in the basal ganglia.

결론 : In this study, we have shown the functional neuroanatomy of the brain associated with sexual arousal by visual sexual stimulation using BOLD-based fMRI. However, further correlational studies with other techniques are needed to verify that fMRI provides an important new tool for evaluating the cerebral center of sexual arousal.