Our previous study showed that “opening eyes wide passively” improved feelings (1).

The change of feelings should reflect the change of the brain activity.

Here we investigated the brain activity using fMRI.

Methods

Subjects: 78 healthy volunteers (43 males & 35 females, mean age = 23.0 y)

fMRI scan: a block design
"open eyes wide passively" versus "open eyes naturally"

Subjects operated goggles between the epochs, and maintained passively their eyes in a wide or natural state.

Duration of each block

tr=1"20"(n=8), 2"(n=42), 2"40"(n=9), or 4"(n=19)

We show the data for 2 minute-duration in this E-Poster (n=42).

fMRI Data Acquisition

1.5T MRI scanner (Siemens, MAGNETOM Avanto)

T2 Echo Planar Imaging (TR: 4080ms, TE: 50ms, Flip angle: 90degree, voxel size: 3x3x3 mm, slice thickness: 3.00 mm, 36 slices/volume, 135 volumes/session)

Functional image analysis

Software: SPM 8 on the MATLAB, Anatomy Toolbox.

Preprocessing: Realignment, Normalization, Spatial smoothing

Preprocessed images were regressed by the time series hemodynamic response function. Anatomical position (x, y, z): MNI coordinates.

Comparison: one-sample t-tests (p<0.001, uncorrected)

Subjective description: what they felt during opening eyes wide.

Results

Broad area of the frontal pole was deactivated.

Small regions of the prefrontal cortex (b~d) were activated.

Relation with subjective descriptions

Frontal pole was deactivated in 23 subjects with below feelings.

clear headed
refreshed
concentrated

deactivation
activation

Regions “b” and “d” were activated in 12 subjects with below feelings.

heightened
restless
aroused
excited
vigorous

deactivation
activation

Conclusions

“Opening eyes wide passively” deactivated the frontal pole.

Subjects, who showed such deactivation, described their feeling change as clear-headed or refreshed.

The frontal pole is suggested to explore the relative value of novel alternative strategies toward more advanced goal-directed behaviors(2).

“Opening eyes wide passively” might calm down the actively working frontal pole.

References