

Magnetic resonance imaging (MRI) protocol

All patients underwent MRI using the same 3-T unit (MAGNETOM Skyra; Siemens Healthineers, Erlangen, Germany) with a 20-channel coil. All patients underwent scanning using the following MRI sequences. The first sequence was a sagittal three-dimensional (3D) T1-weighted magnetization-prepared rapid acquisition gradient echo (MPRAGE), using the following parameters: repetition time (TR) = 2300 ms, echo time (TE) = 2.98 ms, TI = 900 ms, flip angle = 9° , field of view (FOV) = $256 \times 256 \text{ cm}^2$, slice thickness = 1.0 mm, matrix size = 256×256 , voxel size = $1 \times 1 \times 1 \text{ mm}$, NEX = 1, GRAPPA factor = 2. The second was a sagittal 3D fluid-attenuated inversion recovery (FLAIR) sequence of the prospective cohort group using the following parameters: TR = 5000 ms, TE = 393 ms, TI = 1800 ms, FOV = $256 \times 256 \text{ cm}^2$, slice thickness = 1.0 mm, matrix size = 512×512 , voxel size = $0.5 \times 0.5 \times 1$, NEX = 1, GRAPPA factor = 2. For task-based fMRI, a gradient-echo echo-planar imaging sequence was employed, with 120 scans acquired using the following parameters: TR = 3000 ms, TE = 35 ms, FOV = $200 \times 200 \text{ cm}^2$, slice thickness = 4.0 mm with no gap, matrix size = 100×100 , 35 axial slices, and an acquisition time of 6 min. Task-based fMRI images were acquired between the first 3D T1 MPRAGE and the last 3D FLAIR images. The task-based fMRI paradigm is depicted in Figure 1C.