

[Previous Abstract](#)**1114 W-PM****Can dSPM show Hemispheric Language Dominance?**

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Objective: Magnetoencephalography (MEG) may be used as a non-invasive tool for localizing language cortex. Previous studies have shown that language dominant hemisphere (HLD) can be determined with fMRI (functional magnetic resonance imaging), PET (positron emission tomography) or MEG. On the other hand, dSPM (dynamic statistical parametric mapping) is also a very useful tool to show the strength and location of brain activity. However, there are few clinical language studies using spatiotemporal maps such as dSPM. In this study, we investigated HLD using dSPM from MEG data.

Methods: 4 neurological normal subjects aged between 23 and 42 years underwent MEG language mapping using whole-head 306-channel MEG (Neuromag Vectorview Finland). All subjects are right-handed, native speakers. A verbal task was visually presented 120 or 240 ms in subject native language, ISI approximately 2.5 seconds. Some responses were rejected because of huge artifact or noise.

Their dSPM based on MEG were calculated between 150~650ms after stimulation. The dSPM was co-registered with each subject's MRI using anatomical fiducial points. (Siemens 3T MRI, mprage).

Results & Discussion: Results: Figure 1 shows the dSPM results from lateral aspects at 186ms after stimuli from lateral aspect. Compared with right same area activation, significant activation was observed at left Wernicke area. The time courses of Wernicke area in both regions showed significant difference between right and left hemispheres.

Figure 2 shows the dSPM results at 432ms after stimuli. The left Broca area showed strong activation compared with the same area in right hemisphere. The time courses at Broca area in both hemispheres also showed significant difference.

Fig.1 Upper parts: dSPM at 186ms. There is a significant difference between left and right hemisphere activation.

Lower part: Green line shows time course at left Wernicke area. Blue line shows time course at right Wernicke area.

Fig.2 Upper parts: dSPM at 432ms. There is a significant difference between left and right hemisphere activation.

Lower part: Green line shows time course at left Broca area. Blue line shows time course at right Broca area.

Discussion: Our result is consistent with prior reports using MEG, fMRI or PET. Based on these results, we will continue to study HLD using MEG and various inverse solutions i.e., MNE and Wada test in epilepsy patients who underwent Wada test as a pre-surgical evaluation. We need further study with larger population.

Conclusions: New inverse solution such as dSPM is useful to show HLD.

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