



<b>Title</b>	<b>Implications of hydrocephalus upon presentation of tuberculous meningitis</b>
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## **NUS-15 A functional magnetic resonance imaging study comparing brain activations during language task with activations during electrical stimulation of language-implicated acupoints**

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**Introduction:** Functional magnetic resonance imaging (fMRI) can visualize brain activations during various task states. Acupuncture may mediate its effects via modulation of brain activities.

**Method:** We compared the brain activations on fMRI during a word generation task with the activations during electrical stimulation of two language-implicated acupoints in 17 healthy Mandarin-speaking male Chinese volunteers aged between 19 and 26 years. All subjects were strongly right handed according to a handedness inventory.

**Results:** Using a standard fMRI protocol and a word generation paradigm, significant activation was seen in the left and right inferior frontal gyri (Brodmann's area [BA] 44, 45) as well as the left superior temporal gyrus (BA 22, 42). Stronger activation with a larger volume was seen in the left hemisphere. Bipolar electrical stimulation of the language-implicated acupoints, SJ8 (11 subjects) or DU15 (6 subjects), without the word generation paradigm in the same cohort produced significant activation in the right inferior frontal gyrus (BA 44, 46) and in the left and right superior temporal gyrus (BA 22, 42), respectively. In contrast, bipolar electrical stimulation of the adjacent non-acupoints failed to produce any significant brain activation.

**Conclusion:** Ability of acupuncture over SJ8 or DU15 in selective activation of the language-implicated cortical sites may be related to the benefit of acupuncture on SJ8 or DU15 in language disorders. Nevertheless, stimulation of SJ8 or DU15 failed to activate the main cortical sites for language (left BAs 44, 45, 46); only subsidiary language areas are activated.

## **NUS-16 Implications of hydrocephalus upon presentation of tuberculous meningitis**

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**Introduction:** Tuberculous meningitis (TBM) is a serious disorder and hydrocephalus is a known complication of TBM that may occur early or late. The clinical implications of hydrocephalus upon initial presentation of TBM are uncertain.

**Methods:** From January 1997 to September 2001, adults patients diagnosed as TBM in our hospital were studied. Patients referred from other centers for management of hydrocephalus with TBM were excluded. Patients with hydrocephalus on initial or subsequent CT scans were assessed by surgeon and operated if necessary. A standardized regime of anti-TB therapy guided treatment. Patients were followed up regularly for at least 1 year after commencement of anti-TB drugs. A modified Barthel index of 12 or less at 1 year after treatment and mortality were criteria for poor prognosis. Clinical, radiological, microbiological data were analyzed.

**Results:** A total of 31 patients had TBM diagnosed during the study period. Nine of the 31 had hydrocephalus on CT scan upon presentation, and 8 of the 9 required urgent neurosurgical intervention. Of the 22 patients without hydrocephalus on presentation, only 1 developed hydrocephalus subsequently. Age, sex, duration of presenting symptoms and CSF parameters were indifferent between patients with or without hydrocephalus on presentation. Unsteady gait and ataxia ( $p=0.001$ ) were more common in patients with hydrocephalus. Despite having similar Glasgow coma scale on presentation ( $p=0.838$ ), patients with hydrocephalus on presentation were more likely to develop into stage 2 or 3 disease ( $p=0.045$ ) and more likely to develop complicating strokes ( $p=0.012$ ) due to cerebral infarcts ( $p=0.007$ ), with poorer prognosis compared with patients without hydrocephalus on presentation ( $p=0.004$ ).

**Conclusion:** Hydrocephalus upon presentation is common in local TBM patients (29%). This is unrelated to late diagnosis or delayed presentation, suggesting possible abrupt intense inflammatory response to MTB. It seems to be a marker of severe TBM with high risk factor complicating cerebral infarcts associated with poorer prognosis. TBM must be considered for patients who present with hydrocephalus.