Metabolic Alterations after Neuroleptic Treatment in Chronic Schizophrenia by *In Vivo* ^{1}H MR Spectroscopy

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Purpose: To investigate (1) whether there is a lateral effect of ^{1}H MRS observable metabolite ratios between the right and the left prefrontal lobe in chronic schizophrenia, (2) whether there is a change of proton metabolite ratios in chronic schizophrenia after neuroleptic treatment, (3) whether there is a relationship between changes in ^{1}H MRS spectra and the clinical assessment of brief psychiatric rating scale (BPRS), and (4) to investigate a hypofrontality hypothesis in schizophrenia in terms of neurochemical aspects.

Materials and Methods: Localized *in vivo* ^{1}H MRS was used to measure the metabolite levels in the prefrontal lobes of control persons (N=20) and of chronic patients before and after neuroleptic treatment (N=34). The MR spectra of 8 cm^3 voxels were compared with clinical assessment of brief psychiatric rating scale (BPRS) in each subject.

Results: No significant metabolic lateral effect was established in both schizophrenia and control groups ($p>0.05$). After neuroleptic treatment, chronic schizophrenic subjects generally demonstrated a decrease of the complex of γ-aminobutyric acid (GABA) and glutamate (Glu) containing (GABA+Glu)/creatine (Cr) ratio.

Conclusion: The present follow-up ^{1}H MRS study shows a significant correlation between alterations of (GABA+Glu)/Cr ratio and BPRS, and supports a hypofrontality hypothesis in chronic schizophrenia. The reduction of (GABA+Glu)/Cr ratio after neuroleptic treatment may implicate the recovery of normal neuronal function in neurotransmitters. *In vivo* ^{1}H MRS may be a useful modality in follow-up evaluation of neuroleptic treatment in chronic schizophrenia.