

## **The changes of glucose metabolism in the brain before and after antiviral therapy in patients with chronic hepatitis C and cirrhosis**

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### **Abstract**

Recently, antiviral therapy such as Interferon and Ribavirin combination is one of the most important treatment of chronic hepatitis C patients and widely used all over the world. However, adverse effects of this therapy that Depression or neuropsychiatric symptoms might make it difficult to complete.

The aim of this study is to evaluate neuropsychiatric symptoms associated with antiviral therapy and its correlation of effects on cerebral glucose metabolism (CMRglu) in chronic hepatitis C patients.

Seven patients with HCV infection including one cirrhotic patient and six chronic hepatitis patients undergoing antiviral therapy (interferon  $\alpha$  or interferon  $\alpha$ -2b or Peg-interferon  $\alpha$ -2b with Ribavirin) were prospectively evaluated neuropsychiatric symptoms by neuropsychiatric test such as Digit symbol test (DST) and Block design test (BST), and Self-rating Depression Scale (SDS).

And We assessed cerebral glucose metabolism (CMRglu) using [<sup>18</sup>F]deoxyglucose positron emission tomography (FDG-PET) before and at the 8th week of treatment and at 10 week or more after the treatment.

Compare to before and at 8th week of treatment, SDS points of all patients were worsened. Viral load of HCV of six patients were decreased. Viral load of HCV of One patient was unchanged. Digit symbol test of two patients were improved. DST of two patients were unchanged. DST of two patients were worsened. Block design test of one patient was improved. BST of six patients were worsened. CMRglu of six patients were 1-24% decreased in whole of the brain region including Frontal lobe, Occipital lobe, Temporal lobe, Parietal lobe, Cerebellum and Basal ganglia. CMRglu of one patient was increased in the most of all brain regions.

We also examined three patients at 3 month or more after the treatment. Compare to before after the treatment, SDS points of all patients were recovered within normal range. Viral load of HCV of one patient is below analytical sensitivity (SVR). Viral load of HCV of two patients were unchanged (NR).

Digit symbol test (DST) of all patients were improved. Block design test (BST) of one patient was improved. BST of one patient was worsened. BST of one patient was unchanged. CMRglu of all of three patients were 12~96% increased from at 8th week of treatment in whole of the brain. CMRglu of all of three patients were recovered and increased -8~62% from before the treatment.

Rest of the patients are undergoing the therapy.

These results suggest that antiviral therapy affects on cerebral glucose metabolism and Depression or neuropsychiatric symptoms and its abnormalities in chronic hepatitis C patients. This depression or neuropsychiatric symptoms should be reversible. We believe that Cerebral glucose metabolism is affected by antiviral therapy and that might be reversible and associated with depression or neuropsychiatric symptoms.

This study is undergoing and needed more further study to evaluate these effects before and after antiviral study.

We try to confirm this important new findings, and make good use of antiviral therapy of chronic hepatitis C patients.