Involvement of the corpus callosum splenium in a case with SSPE: magnetic resonance spectroscopy findings

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Subacute sclerosing panencephalitis (SSPE) is a fatal, incurable, inflammatory, and neurodegenerative disease. The parieto-occipital lobes are the most frequently and severely affected. The basal ganglia, cerebellum, spinal cord and corpus callosum are less frequently involved [1-4]. Because magnetic resonance spectroscopy (MRS) provides information regarding *in vivo* brain metabolism and neuronal function, it is a promising method that may illustrate the pathophysiological features of SSPE [5-8]. To our knowledge, this is the first report of MRS findings of corpus callosum in a case with SSPE.

A 15-year-old, previously healthy boy was hospitalized because of 4-week history of muscle weakness, impaired vision, and gait imbalance. He had not been vaccinated. A neurological examination revealed symmetric muscular weakness, ataxia, sequential slow movement, decreased motor activity and deep tendon reflexes, and negative Babinski reflex. He had exhibited myoclonic jerks, intellectual deterioration and behavioral changes. The characteristic burst suppression pattern was seen on EEG. Cerebrospinal fluid investigation revealed oligoclonal IgG bands and elevated titers of the measles antibody. He was diagnosed as clinical stage II according to the Jabbour classification.

Magnetic resonance imaging (MRI) demonstrated diffuse hyperintensity in the cortical gray and subcortical, deep and periventricular white matter of the parieto-occipital region with mass effect observed as sulcal effacement and hyperintensity in the splenium of the corpus callosum on T2 and FLAIR weighted images. MRS was performed (TE: 135 ms). Voxels were placed in the right parietooccipital region and splenium of the corpus callosum. MR spectrum obtained from right parietooccipital subcortical and deep white matter and splenium of the corpus callosum showed a significant decrease in N-acetylaspartate (NAA)/creatine (Cr) and increase in the ratio of choline (Cho)/Cr. Additionally, there were also inverted prominent lactate peaks (Figures 1 and 2).

Subacute sclerosing panencephalitis is persistent and chronic encephalitis secondary to measles virus infection that causes widespread demyelination of the central nervous system. Since clinical profiles of the disease lead to various presentations, early diagnosis and true clinical staging are not always easy. Usually, MRI findings and the clinical stage of SSPE are

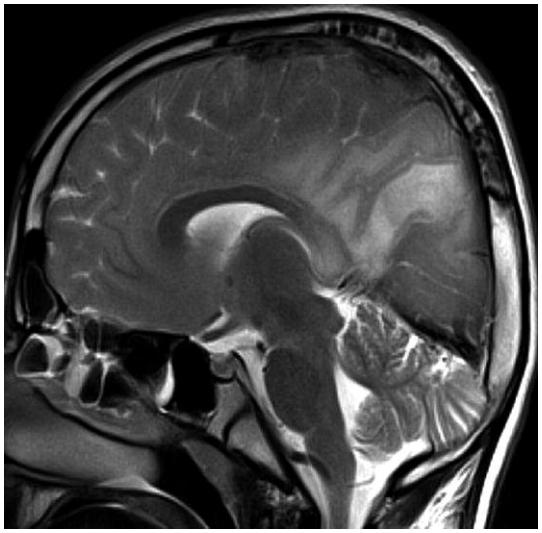

Figure 1. Sagittal T2-weighted images show widespread hyperintensities in cortical-subcortical and deep periventricular white matter of right parieto-occipital region and in splenium of corpus callosum

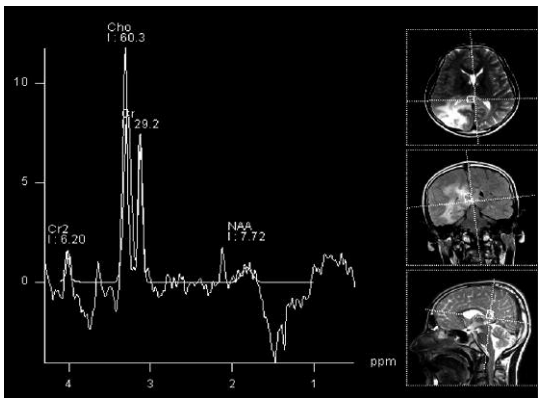

Figure 2. Multivoxel MRS (TE: 135 ms) obtained from splenium of corpus callosum reveal prominent decreased NAA/Cr, increased Cho/Cr and presence of lactate at 1.33 ppm (inverted double)

not correlated. It is not possible to define these findings as improvement or progression based on the MRI findings alone. Despite the progress of SSPE, improvement of MRI findings may be seen [2-5].

It has been reported that histopathological examinations show evidence of neuronal loss, astrogliosis, demyelination, and infiltration of inflammatory cells [5]. Magnetic resonance spectroscopy can provide information on neuronal and axonal viability, cellular energetics, and membrane status. In our case, MRS showed significantly decreased NAA/Cr ratios in the right parietooccipital subcortical white matter and splenium of the corpus callosum. The MR spectrum of the corpus callosal splenial lesion revealed increased Cho/Cr and presence of lactate. These findings might indicate neuronal loss, demyelination, active inflammation and/or anaerobic metabolism. Magnetic resonance spectroscopy findings were consistent with stage III SSPE [5]. Although to date SSPE is not completely curable, with early diagnosis it is possible to slow the progression of the disease.

Although MRS is not specific or diagnostic, it can show metabolic changes in the early-late stage [7]. For this reason, MRS may be useful to reveal the extent and progression of SSPE.

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