Summary

Magnetic resonance spectroscopy is a non invasive method in detecting abnormal spectra of various brain metabolites as N-acetylaspartate (NAA), Choline (Cho) and Creatine (Cr). It has become a diagnostic tool for assessing a number of diseases of the central nervous system mainly including epilepsies and brain tumours.

Epilepsy belongs to the most prevalent neurological disorders. About 30% of the patients are refractory to conventional anti-epileptic drugs and many experience side effects such as sedation and cognitive impairment. The majority of patients suffer from complex partial seizures, which have been shown to originate in many cases in the mesial temporal lobe structures, particularly in the hippocampal-amygdaloid region.

Patients with medically uncontrolled partial seizures are possible candidates for surgery so the seizure focus must be correctly lateralized. Electroencephalography EEG, video EEG , structural and metabolic imaging are used for lateralization.

MRI can show structural abnormalities in 70-90% of patients with refractory temporal lobe epilepsy. MRS shows abnormal metabolite ratios even in MR negative patients. The most sensitive ratio is the NAA/Cho+Cr ratio.

MRS can detect abnormal metabolite ratios in the affected temporal lobe concordant with the EEG lateralization with greater accuracy than conventional MRI. The abnormal metabolite ratios can even be seen on the contralateral temporal lobe but to a lesser extent. With the use of asymmetry index correct lateralization can be achieved even in bilateral temporal lobe affection.

The reduction of the NAA/Cho+Cr ratio in the patients who are not well controlled by AED is more severe than those patients who are well controlled.