

**EARLY DIAGNOSIS OF HUMAN TSE BY MULTIMODALITY MRI:
SPECTROSCOPIC DETECTION OF THALAMIC GLIOSIS IN A PATIENT
WITH FFI AND NORMAL FLAIR AND DIFFUSION-WEIGHTED IMAGING**

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Recently, several reports underlined the usefulness of brain MRI for the diagnosis of Creutzfeldt-Jakob disease. FLAIR sequence and diffusion-weighted imaging (DWI) are considered as high sensitive sequences to detect signal alteration of the cortex and the deep grey matter. Recent advances in therapeutic approach of patients with prion diseases have emphasized the need for earlier diagnostic markers that would authorize the onset of treatment before massive and irreversible lesions of the brain have occurred. Consequently, we designed a radio-clinical study using a multimodality MRI standardized procedure that aimed to estimate differential sensitivity of FLAIR, DWI and MR spectroscopy for the diagnosis of human TSE. Here we report a case of familial fatal insomnia with the D178N-129M mutation. FLAIR and diffusion-weighted sequences were normal in the whole brain notably in both thalami. However, spectroscopic study showed a striking increase of the peak of myo-inositol (mI) and of the mI/NAA ratio in the thalamus when compared to the other studied brain regions of the patient (frontal isocortex, lenticular nucleus and cerebellar vermis) and to the thalami of control cases (n = 10). This metabolite pattern is indicating of gliosis. Because the MRI study was performed only two days before death, we were able to strictly correlate the spectroscopic data with the neuropathological lesions (including the severity of astrogliosis and microglial activation) observed in the thalamus. From this observation, we can conclude that 1) MR spectroscopy can detect prion-related lesions even when other sequences appear normal 2) spectroscopic metabolite pattern well correlates with the neuropathological one.