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White matter structural damage results in memory decline and impaired visual information processing in abstinent chronic alcoholics as seen on DTI

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Chronic alcohol abuse is characterized by impaired cognitive abilities with a more severe deficit in visual than in verbal function.

Using DTI we found evidence of microstructural deficits in abstinent alcoholic men in white matter tracts of the right hemisphere. We found inverse correlation of FA with memory dysfunction scores in white matter tracts associated with reward circuitry suggesting that white matter deficit could contribute to memory decline in chronic alcoholics.

Neuropsychological tests to assess visual processing skills and deficits were correlated with Fractional Anisotropy and Mean Diffusivity in the inferior and superior fronto-occipital fasciculus. We found reduced FA and increased MD in these tracts. FA showed an inverse correlation while MD showed a direct correlation with neuropsychological tests.

Further spectroscopy studies at our centre also showed a significant increase in Cho/Cr and myo-inositol /creatine ratios while NAA/Cr and Glutamate-Glutamine/Creatine were significantly decreased. The results suggest that metabolic alterations in the primary visual cortex may contribute to neuropsychological impairment in visual information processing.

Biography

Namita Singh now working as Scientist 'E' at Institute of Nuclear Medicine and Allied Sciences (INMAS), Delhi. She earned her MBBS degree from Lady Hardinge Medical College, Delhi University, India in 1990. She has done her MD in Radio-diagnosis from Delhi University in 1999. She had served with Indian Army Medical Corps from 1992 to 2002 and joined INMAS in 2004 where she is working in the NMR Department housing a 3T MRI from Siemens (Skyra). Her current interest involves studying cognitive impairment in alcoholic subjects, HIV positive subjects using advanced MR imaging techniques. She has also conducted research on spinal tuberculosis using DTI.

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