Abstract


Thiamine deficiency related microstructural brain changes in acute and acute-on-chronic liver failure of non-alcoholic etiology.


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BACKGROUND & AIMS: Mammillary body atrophy in alcoholic liver disease usually indicates thiamine deficiency. The purpose of this study was to explore the relationship among blood thiamine, mammillary bodies, major fiber bundle fractional anisotropy, and volume changes with diffusion tensor tractography in patients with acute and acute-on-chronic liver failure of non-alcoholic etiology.

METHODS: Blood thiamine, mammillary bodies, fiber bundle fractional anisotropy and volume of major fiber tracts were quantified from acute and acute-on-chronic liver failure patients and compared with healthy controls. In 7 acute liver failure patients, follow-up study was done after clinical recovery at 5 weeks.

RESULTS: Blood thiamine, mammillary bodies and fornix volume, and fornix fiber bundle fractional anisotropy were significantly decreased as compared to controls. Blood thiamine showed significant positive correlation with mammillary bodies' volume only. On follow-up study, acute liver failure patients showed significant reversibility only in blood thiamine level and mammillary bodies' volume.

CONCLUSIONS: Mammillary bodies' volume changes are primarily a consequence of thiamine deficiency, which may secondarily result in microstructural changes in the fornix. These observable changes are known to be specific and may be reversible with restoration of blood thiamine level. These imaging changes may be used as imaging biomarker of thiamine deficiency in these patients in future.

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