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Case report

Effect of statin treatment on adrenomyeloneuropathy with cerebral inflammation: A revisit

Chen-Chang Shih[a,*], Yih-Ru Wu[b], Guey-Jen Lee-Chen[c], Chih-Ying Chao[b]

[a] Department of Neurology, Hualien Mennonite Christian Hospital, Hualien, Taiwan
[b] Department of Neurology, Chang Gung Memorial Hospital, Chang-Gung University College of Medicine, Taipei, Taiwan
[c] Department of Life Science, National Taiwan Normal University, Taipei, Taiwan

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1. Introduction

X-linked adrenoleukodystrophy (X-ALD; MIM #300100) is a neurodegenerative metabolic disease due to mutations in the "ATP-binding cassette, sub-family D (ALD), member 1" gene (ABCD1) at Xq28 [1]. Adrenoleukodystrophy protein (ALDP), coded by the ABCD1 gene, participates in the transport of cytosolic very long chain fatty acid (VLCFA) into the peroxisome for homeostatic β-oxidation [1]. The impaired peroxisomal β-oxidation of VLCFA in X-ALD patient results in VLCFA accumulation, characterized by supra-normal ratios of saturated VLCFA to shorter-chain fatty acid species in tissues and circulating plasma, witch may in turn lead to a neuroinflammatory process associated with demyelination of the cerebral white matter [1]. There was no cure for X-ALD patient despite early diagnosis. Lovastatin, a 3-hydroxy-3-methyl-glutaryl-coenzyme A (HMG-CoA) reductase inhibitor, was reported to reduce cholesterol and saturated VLCFA levels in adult ALD patients [2]. However, the evidence of clinical improvement was limited [2]. We report a case with genetic evidence and magnetic resonance imaging (MRI) features of cerebral inflammation. Although the ratio of C26:0/C22:0 and C24:0/C22:0 in plasma were decreased after statin treatment, the clinical manifestation and the follow-up brain images suggest disease was still in progress.

2. Case report

A 45-year-old male had initial symptom of mild bilateral legs stiffness with difficulty in running since he was 25-year-old. At the age 30, he suffered from ejaculation difficulty leading to infertility. The gait problem with lower limbs weakness developed insidiously in the following year. MRI of the cervical spine showed mild cord atrophy. Based on the image findings and clinical history, spinocerebellar degeneration was found since then. He became wheel-chair bound because of spastic paraplegia at the age of 40. At age 45, he was admitted due to frequent choking, muscle cramping and uncontrolled laughing.

According to the history records, his parents and the only elder brother were not recorded with these symptoms. The patient had no history of seizure, substances abuse, alcoholism or head trauma before the age of 30.

Neurological examination revealed spastic weakness with disused atrophy of lower extremities. The muscle power in the four limbs was ranged between Medical Research Council (MRC) grade 2–3. All deep tendon reflexes were hyperreflexia with clonus at both ankles, but the plantar responses were flexor. The cranial nerves examination showed dysarthria, dysphagia and pseudobulbar palsy. Sensory modalities were intact. There were neither nystagmus nor finger-nose-finger dysmetria. No extrapyramidal signs can be elicited. The levels of blood panels including electrolytes, renal and liver function tests and full blood count were all shown within the reference ranges. High adrenocorticotropic hormone 470 (<52 μg/dl) and low cortisol level 8.4 (<8.7 μg/dl) suggest primary adrenal insufficiency. Nerve conduction study showed mild slow nerve velocity with

* Corresponding author at: Department of Neurology, Hualien Mennonite Christian Hospital, 44 Min-Chuan Road, Hualien, 970, Taiwan. Tel.: +886 38241234; fax: +886 38241496.
E-mail address: ccshih@mch.org.tw (C.-C. Shih).

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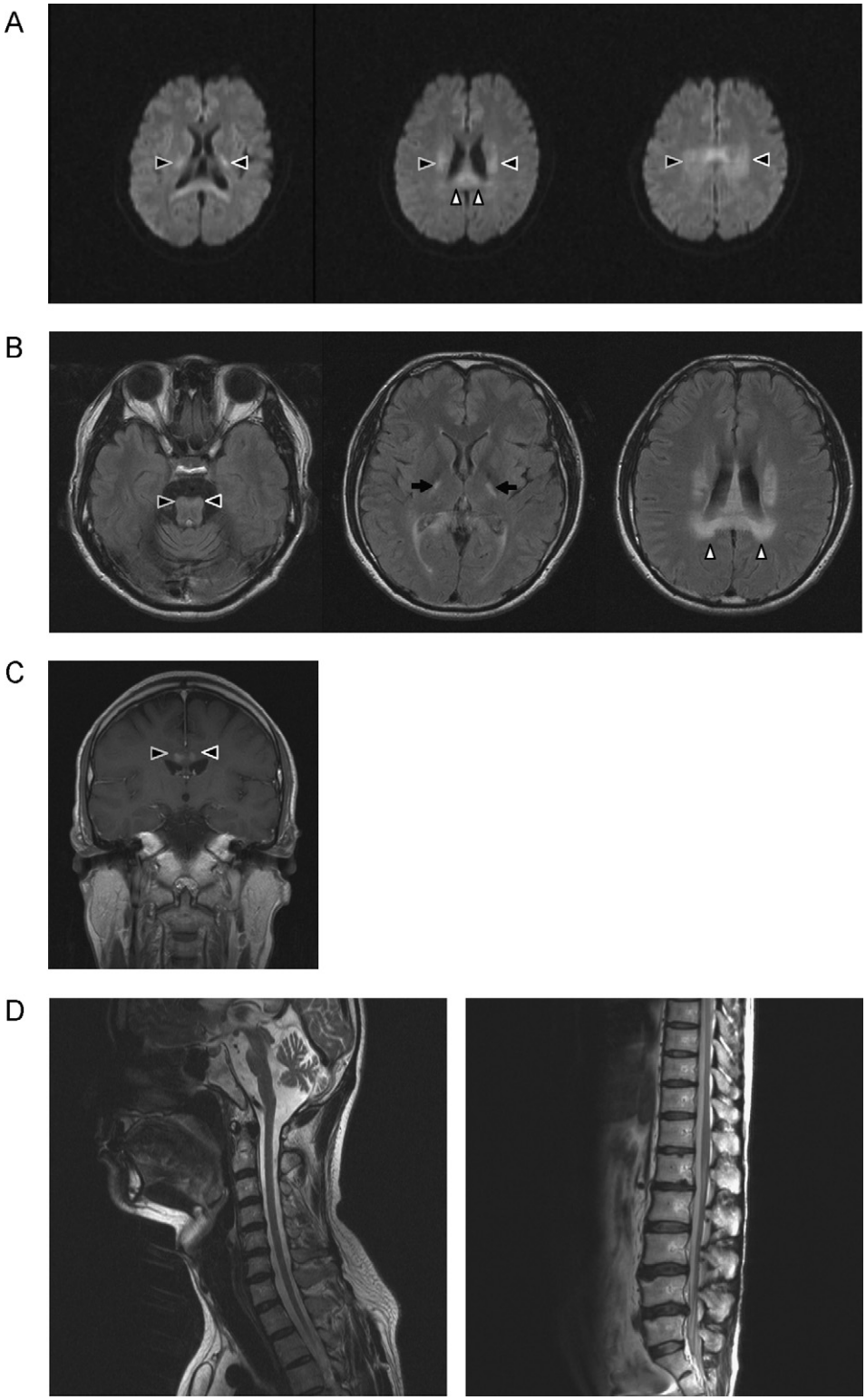

Fig. 1. (A) Diffusion weight image of the brain MRI showed demyelination changes at posterior limbs of the internal capsule (black arrowheads) and splenium of the corpus callosum (white arrowheads) at the age 45. (B) Fluid-attenuated inversion-recovery weighted images of the Brain MRI showed symmetrical hyperintense lesions at bilateral pontomedullary corticospinal tracts (black arrowheads), posterior limbs of internal capsule (black arrow) and splenium of corpus callosum (white arrowheads) at the age 45. (C) T1 weighted image of the brain showed contrast enhancement at splenium of corpus callosum (black arrowheads) at the age 45 (D) Severe atrophic changes at the brain stem, the cerebellum and the spinal cord at the age 45.

disproportional prolonged F-wave at both upper and lower limbs.

MRI of the brain at age 45 showed symmetrical hyperintense lesions at posterior limbs of the internal capsule and splenium of the corpus callosum on diffusion-weighted images (DWI) (Fig. 1A) and fluid-attenuated inversion-recovery (FLAIR) (Fig. 1B). In addition, a mild hyperintense lesion was found in bilateral pontomedullary corticospinal tract. Mild contrast enhancement was