Neuroacanthocytosis: A Rare Inherited Movement Disorder

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SUMMARY

The chorea-acanthocytosis syndrome (CHAC) is a rare disorder beginning in late adolescent or adult life in association with acanthocytosis, a normal lipid profile and characterized by progressive neurological disease. The inheritance is usually autosomal recessive[1], although apparent sporadic[2] and autosomal dominant[5] instances are also known. We report here a young man who presented with choreo-athetoid movement, dystonia, tics, symmetrical axonal polyneuropathy with normal cognitive function. The subsequent peripheral blood film reveals acanthocytes >5%. Diagnosis of neuroacanthocytosis was made.

KEY WORDS:
Chorea-acanthocytosis syndrome, rare disorder, progressive neurological disease, Autosomal Recessive.

INTRODUCTION

Choreoacanthocytosis (CHAC) is an uncommon neurodegenerative disorder characterized by a variable combination of involuntary movements, cognitive decline, behavioral changes, seizures and polyneuropathy[1]. Symptoms typically begin between 20 and 40 years of age, but earlier and later onset occur as well[2]. Initial presentation with choreoathetosis, orofacial dyskinesia, buccolingual self mutilation, tics and obsessive compulsive symptoms is suggestive of CHAC. However, the early clinical course is occasionally dominated by dystonia[2], parkinsonism[3], seizures[2], lower neuron signs, depression or psychosis[2]. When suspected, the diagnosis is supported by the presence of peripheral blood acanthocytosis, but this is not specific[1] and may appear only late.

CASE REPORT

A 30-year old Chinese man was referred to the Neurology Clinic in Penang General Hospital for involuntary movements noted over the right side of the body beginning in September 2001. He had had more than ten minor accidents from falls in the last few years due to his inability to control his movement. He also noted that he could easily lose the grip over objects such as a pen or a cup. The symptoms had progressively worsened and eventually, involved the left side of his body and face. Apart from this, he also complained of poor sleep because of frequent nightmares and intrusive thoughts.

There was no history of taking any antipsychotic drugs. No significant medical or surgical history was noted. The patient was the result of a non-consanguineous union and there was no psychiatric, cognitive or movement disorder problem among his family members.

Patient was teetotal and non-smoker. He worked as an electronic technician in a factory but was retrenched during the economic crisis of the late 90s.

At his first review, the patient had been wheeled in by his sister and it was clearly observed that he had abnormal choreo – athetoid movement with dystonia and tics involving mainly the face, neck and the trunk. His speech was slurred and both the lips and tongue were deformed due to self mutilation as result of involuntary biting. Neurologically, the tone of all four limbs was normal. The power for the upper limbs was rated 3/5 proximally and 4/5 distally while the power of the lower limbs was 4/5. The reflexes in all the limbs were normal. There were no cerebellar signs and the sensory system was normal. Mini Mental State Examination (MMSE) was recorded as 29/30. Fundoscopy shows normal findings.

Other systems (like cardiovascular, respiratory and abdomen) were normal. Multiple scars over the scalp were noted as a result of the alleged falls.

Investigation

MRI brain was Normal. Serum caeruloplasmin was 0.27 g/L (Normal: 0.15- 0.60). VDRL and retroviral screen was negative. ESR was 15 mm/hr. Renal, liver and thyroid function test was normal. Connective tissue screening was negative. Creatinine kinase was normal. Lipid profile was normal.

Full blood count report reveals Hb 14.3 g%, WBC 8.4 x 10^3 per uL, Platelet 210 x 10^3 per uL. Blood film report was as below: The red blood cells are normochromic, normocytic with anisopoikilocytosis. Acanthocytes > 5% seen. Occasional fragmented cells are seen. The white blood cells and platelet are adequate.

Impression: Acanthocytosis - To search for underlying cause.

Nerve conduction studies (NCS) showed diffuse distal sensory motor axonal polyneuropathy. Electromyography was normal.

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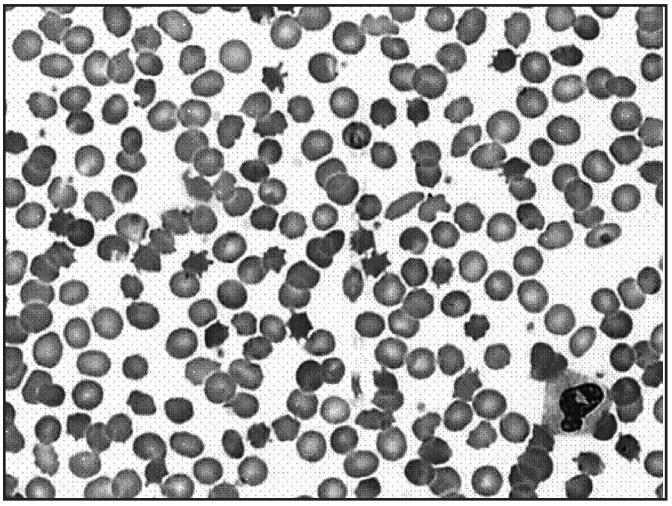

Fig. 1: Peripheral blood film showing acanthocytes > 5%.

DISCUSSION

Neuroacanthocytosis is a group of phenotypically and genetically heterogenous conditions unified by neurological dysfunction and acanthocytosis. Typical neurological manifestations as explained include cognitive deterioration, personality changes, ataxia, motor tics and Parkinsonism[3].

"Neuroacanthocytosis" is normally used to refer to autosomal recessive chorea-acanthocytosis and X-linked McLeod syndrome, but there are other movement disorders in which erythrocyte acanthocytosis may also be seen, such as Huntington disease-like[2] and pantothenate kinase associated neurodegeneration[5]. Improved genetic testing has enabled us to distinguish between theses disorders.

Linkage studies have identified a responsible gene at chromosome 9q21, affecting the CHAC (chorea-acanthocytosis) gene that encodes a structural protein named chorein; the gene has now been renamed VPS 13A[1].

A finding of acanthocytes more than 3% in fresh peripheral blood film is required for a diagnosis of neuroacanthocytosis. Our patient had a fresh blood film showing acanthocytosis of more than 5%, a significant increase. Clinically, he presented with chorea-athetoid movements and orofacial dyskinesia. In addition, there was also evidence of axonal peripheral neuropathy on NCS. However, there was no MRI evidence of atrophy and gliosis of the caudate nuclei and putamina of this man.

Sadly, the management until today remains mainly supportive with genetic counseling provided. Management includes a general approach on the treatment of chorea include the use of haloperidol and supportive measures from nutritional and orthotic perspective. Prognosis is affected by the disability caused by the disease and the eventual dependence on a caregiver for activities of daily living.

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