Brain atrophy following hemiplegic migraine attacks.
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Variants: p.Ser218Leu (S218L).

Diagnosis/symptoms: SHM (sporadic hemiplegic migraine).

This paper summarizes a 16-year follow up for a 19-year-old female patient who was diagnosed with sporadic hemiplegic migraine (**SHM**) as a child. The diagnosis was linked to a *de novo* (non-inherited) *CACNA1A* variant pSer218Leu.

The patient showed impaired psychomotor (cognitive-motor abilities) development and cerebellar ataxia from infancy. From the ages of 3 to 12 years, the patient experienced 9 severe hemiplegic migraine (HM) attacks, many of which required medical intervention and hospital stays. The first attack was experienced after minor head trauma at the age of 3. Symptoms of the migraines included loss of or decrease in consciousness, hemiconvulsions, hemiparesis (slight weakening of one side of the body), epileptic seizures, and cytotoxic oedema (swelling in the brain). Brain MRIs over the years showed both cerebral (brain) and cerebellar atrophy (shrinkage). The patient began a treatment of flunarizine and sodium valproate at age 12, after which the severe hemiplegic migraines stopped. She still experienced mild attacks of motor weakness that would resolve themselves within hours. She also continued to exhibit mild ataxia (uncontrolled muscle movement, balance, and coordination), and her cognitive-motor abilities continued to worsen with age. However, MRIs at age 19 showed no further brain or cerebellar atrophy. Because of this, the authors concluded that the decrease in the cognitive-motor abilities were likely not due to cerebellar atrophy

The authors also noted that the Ser218Leu variant has been linked in other patients to a higher chance of cortical spread depression (CSD). This is when neurons in the brain are temporarily inactivated and can lead to the swelling of the brain that was observed in this patient. CSD has also been linked to the death of neurons, which can explain the shrinkage seen in the brain. The authors conclude that early intervention using medication to stop severe hemiplegic migraines is vital to prevent permanent brain damage. However, they also point out their limitations that this study only included one patient and other health variables might have been in play.

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