Hydroxyzine-induced Vertical Nystagmus

Nystagmus is an involuntary movement in which the eye moves both rapidly and slowly on a vertical or horizontal axis. Acquired nystagmus can result from a range of neurological disorders, such as cerebellar disease, multiple sclerosis, vestibular disease, stroke, tumors, and trauma; or as an adverse effect of drugs (sedatives, anticonvulsants and alcohol). Horizontal nystagmus can be of peripheral-vestibular or central origin, while vertical nystagmus most often results from a lesion of the ocular motor pathways or centered within the brainstem. Drugs can cause both vertical and horizontal nystagmus *via* the dopaminergic-cholinergic blockade; for example, hydroxyzine is an H1-receptor blocker that can have anticholinergic effects.

An 8-year-old girl presented with fever and nuchal rigidity, and a fluid examination confirmed the diagnosis of meningitis. Vancomycin and ceftriaxone were administered; however, due to an allergic rash that appeared after the infusion of the ceftriaxone, oral hydroxyzine was started (2 mg/kg/day divided into 3 doses). On the 3rd day of treatment, the patient complained that her eye ball were moving up and down. Upon physical examination, a medium degree of vertical nystagmus was detected in both eyes (*Fig*. 1 and *Web Video* 1); there were no additional neurological findings. Her brain magnetic resonance imaging was normal, and no alternative causes of the vertical nystagmus were

FIG.1 *Vertical nystagmus*

found. Hydroxyzine was discontinued, the nystagmus disappeared within 24 hours, and it did not relapse. After that, the meningitis therapy was completed, and the patient was discharged without any sequelae.

The most common side effects of hydroxyzine are drowsiness and decreased alertness. Voltage-gated sodium channels are expressed in the cerebellar Purkinje neurons, and sodium channel blocking is considered to be the cause of nystagmus in patients with antihistamine poisoning.

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