

Review

Post-vaccination encephalomyelitis: Literature review and illustrative case

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Abstract

Acute disseminated encephalomyelitis (ADEM) is an inflammatory demyelinating disease of the central nervous system that is usually considered a monophasic disease. ADEM forms one of several categories of primary inflammatory demyelinating disorders of the central nervous system including multiple sclerosis, optic neuropathy, acute transverse myelitis, and neuromyelitis optica (Devic's disease). Post-infectious and post-immunisation encephalomyelitis make up about three-quarters of cases, where the timing of a febrile event is associated with the onset of neurological disease. Post-vaccination ADEM has been associated with several vaccines such as rabies, diphtheria–tetanus–polio, smallpox, measles, mumps, rubella, Japanese B encephalitis, pertussis, influenza, hepatitis B, and the Hog vaccine. We review ADEM with particular emphasis on vaccination as the precipitating factor. We performed a literature search using Medline (1976–2007) with search terms including “ADEM”, “acute disseminated encephalomyelitis”, “encephalomyelitis”, “vaccination”, and “immunisation”. A patient presenting with bilateral optic neuropathies within 3 weeks of “inactivated” influenza vaccination followed by delayed onset of ADEM 3 months post-vaccination is described.

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1. Introduction

Acute disseminated encephalomyelitis (ADEM) is an inflammatory demyelinating disease of the central nervous system (CNS) that is usually considered a monophasic disease, but a relapsing variant (distinct from multiple sclerosis) is well recognised – multiphasic disseminated encephalomyelitis (MDEM).¹ Post-infectious and post-immunisation encephalomyelitis make up about three-quarters of cases, where the timing of a febrile event is associated with the onset of neurological disease.² Although the two syndromes are distinguished by their

precipitant, clinically and pathologically they are very similar. ADEM forms one of several categories of primary inflammatory demyelinating disorders of the CNS. Others include multiple sclerosis (MS), optic neuropathy, acute transverse myelitis, and neuromyelitis optica (Devic's disease).¹

ADEM has an estimated annual incidence of 0.8 per 100,000 with a median age of onset of 6.5 years.² Although ADEM can occur at any age, it is more common in children. Optic neuropathy and ADEM are rare complications associated with vaccinations.^{1,3–5} Most case reports describe patients experiencing a unilateral or bilateral optic neuropathy or ADEM, rather than simultaneous onset of both conditions. Optic neuropathy has also recurred in one patient after repeat administration of the influenza vaccination.⁴ The presumptive mechanism is immune-mediated demyelination although immune-complex mediated

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