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Case Report

Guillain-barré syndrome after purified vero cell rabies vaccination: An unusual case report

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ABSTRACT

Guillain-Barré syndrome (GBS) can be described as a collection of clinical syndromes that manifests as an acute inflammatory polyradiculoneuropathy with resultant weakness and diminished reflexes. Regarding pathophysiology of GBS, it is believed that autoimmunity- molecular mimicry plays a role in its pathogenesis. As the vaccines have an effect on the immune system it is reasonable that immunizations may be associated with subsequent GBS. Although rabies vaccines containing neural elements are very well known cause for GBS, no such positive correlation has been proven after newer formulations of rabies vaccine, derived from chick embryo cells. Here we report a case of GBS which developed after 5 weeks of anti-rabies vaccination (Purified Vero cell rabies vaccine) which was given after dog bite.

1. Introduction

Guillain-Barré syndrome (GBS) is the leading cause of acute flaccid paralysis. Up to two thirds of patients report an antecedent bacterial or viral illness prior to the onset of neurologic symptoms.Vaccinations have been linked to GBS by temporal association. The role of vaccination in the development of Guillain-Barré syndrome (GBS) is controversial, although cases of GBS have been reported following a wide range of vaccines.[1] In most cases, however, no definite causal relation has been established between vaccines and GBS, with the exception of rabies vaccine prepared from infected brain tissue and the 1976 swine flu vaccine.

2. Case Report

A 28 years old male was admitted with complaints of acute onset rapidly progressive quadriparesis for 8 days. He had only motor weakness which started in bilateral upper limbs distally, then spreading proximally and involving lower limbs in 2 days of duration and there after being static. He had no history of paraesthesia or numbness in limb, of bowl bladder involvement or dysphagia, dysarthria, facial deviation, respiratory difficulty etc. There was no history of preceding fever, loose stool, and upper respiratory tract infection. Patient had history of dog bite before 5 weeks and had taken 4 dose of anti-rabies vaccine (Purified Vero cell rabies vaccine) intramuscularly.

On evaluation had normal vital parameters with pulse rate of 82 per minute regular, good in volume, blood pressure of 117/74mm of Hg right arm supine position, respiratory rate of 16 per minute abdominothoracic, and afebrile. He had normal higher mental and cranial nerves examination. There was hypotonia with power 0/5(MRS grading) in both upper and lower limbs, with absent deep tendon reflexes and bilateral mute planter response. Sensory examination was normal.

Regarding investigations his hemoglobin, white blood cell counts and platelets were normal. Serum potassium was also normal and urine for porphobilinogen was negative. Nerve conduction study were suggestive of right peroneal axonal neuropathy and rest motor nerves of upper and lower limbs were non-recordable, and all sensory nerves were normal. His cerebrospinal fluid examination was showing

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albumino-cytological dissociation (Protein- 96, Cells- 4). The MRI of cervical spine was normal.

So, it was acute motor axonal nauropathy (AMAN) variant of GBS and treated with intravenous immunoglobulin (IvIg) 2gm/kg over period of 5 days. During 7 days of hospital stay, only mild improvement occurred in form of flickering of fingers and toes. After 3 months patient improved up to GBS score 3 (able to walk with one person support).

3. Discussion

GBS is an acquired immune mediated polyradiculoneuropathy with incompletely understood pathogenic mechanisms. About two thirds of patients have a preceding infection within the previous 4-6 weeks, most commonly respiratory symptoms or gastroenteritis. Infectious agents include Mycoplasma pneumoniae, Campylobacter jejuni, Cytomegalovirus, and Epstein Bar virus.[2] Vaccine-associated Guillain–Barre syndrome is defined as those with the onset of Guillain–Barre syndrome symptoms within the six-week period after receiving the vaccine, as reported by Vaccine Adverse Event Reporting System (VAERS).[3] Developing countries continue to use the nerve tissue rabies vaccines despite the high frequency of serious neurological complications such as encephalitis, encephalomyelitis, myeloradiculitis and polyradiculitis. The pathogenesis involves demyelination occurring due to an autoimmune reaction against myelin, triggered by the vaccine.[4,5]

Following administration of the old nerve tissue vaccine, the incidence of cases of neurological complications reported in the literature varies greatly, ranging from 0.14 per 1,000 to 7 per 1,000 cases per treatments.[6] At least five cases of central nervous system disease, including transient neuroparalytic illness of Guillain–Barré type, have been reported among the millions of individuals given human diploid cell vaccine (non-nerural vaccine). This rate may not be an increase above the background rate of about 1 per 100,000 per year.[7]

Purified Vero cell rabies vaccine (PVRV) contains inactivated and lyophilized Wistar strain of rabies virus grown on Vero cell cultures in fermenters allowing mass cultivation (Vero cells are derived from the kidney of an African green monkey).[8] Very few (less than 10) cases of GBS like polyradiculoneuropathy have been reported worldwide after cell culture vaccines and, actual incidence of GBS is very high (1.2-3 per 100,000 population per year), so it's very difficult to make any positive correlation that cell culture vaccine actually causes GBS. Regarding rest of vaccines (Influenza, oral polio, hepatitis B, measles), all previous studies failed to establish a statistically significant causal relationship between administration of the vaccine and GBS (though few studies found increase relative risk of GBS after vaccination).[9] In our case, we had patient who developed AMAN variant GBS without any preceding viral or bacterial infection, but history of dog bite before 5 weeks and taken vero cell culture rabies vaccine. It's very difficult to say whether our patient developed GBS due to vaccine or its accidental finding. Even the Covid-19 vaccine is not being implicated for development of GBS[10] reporting such cases, may be in future we will come to conclusion that this cell culture rabies vaccine actually increases relative risk of GBS or not.

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5. Conflicts of Interest

There are no conflicts of interest.

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