

LETTER TO THE EDITOR

Postural tachycardia syndrome after vaccination with Gardasil

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Postural tachycardia syndrome (POTS) is a heterogeneous disorder of the autonomic nervous system, consisting of orthostatic intolerance and an increase in heart rate of more than 30 bpm within 10 min of standing or head-up tilt [1].

Human Papillomavirus Quadrivalent Vaccine, Gardasil, has been approved for prevention of cervical cancer in women, aged 9–26. We describe a 20-year-old woman who developed POTS after vaccination with Gardasil.

Two weeks after receiving the first of the 3-dose series of Gardasil vaccine, the patient developed dizziness, exercise intolerance, fatigue, nausea and a loss of appetite. Initially, a viral illness was suspected, but after months of persistent and debilitating symptoms, accompanied by a weight loss of 20 pounds in 3 months and no serologic evidence of an infectious disease, this diagnosis was refuted. Subsequently, an eating disorder was considered, but after a thorough medical evaluation and a consultation with psychiatrist, this diagnosis was also excluded.

Eventually, after numerous unrevealing cardiac, endocrine and rheumatologic

tests, a tilt table test confirmed the diagnosis of POTS by demonstrating an increase in heart rate from 72 bpm supine to 140 bpm within 10 min of tilt without orthostatic hypotension and accompanied by symptoms of orthostatic intolerance. The patient tested negative for ganglionic acetylcholine receptor antibody.

The patient's medical history was unremarkable for pre-existing orthostatic symptoms or exercise intolerance. There was no family history of cardiac, autoimmune or autonomic disorders. Other than vaccination with Gardasil 2 weeks prior to symptom onset, there were no other factors or events preceding the illness.

Although precise pathogenesis of POTS remains elusive, an autoimmune aetiology has been implicated in about 14% of patients with POTS after detection of ganglionic acetylcholine receptor antibody [2]. Autonomic disorders coexisting with various autoimmune diseases, such as myasthenia gravis, lupus, rheumatoid arthritis and Sjogren's syndrome, have been described [3]. In the case reported here, the temporal relationship between vaccination and illness onset suggests a possible association between *de novo* POTS and vaccination with Gardasil.

Postural tachycardia syndrome is currently viewed as an attenuated form of the autoimmune autonomic ganglionopathy, which can be seronegative for ganglionic acetylcholine receptor antibody, as in the case of this patient [4]. As cross-reacting antibodies are found in various post-vaccination disorders, such as Guillain–Barre syndrome and transverse myelitis, it is conceivable that a cross-reacting, yet unidentified, antibody other than to ganglionic acetylcholine receptor may underlie the pathogenesis of POTS in the setting of an antecedent vaccination.

Gardasil vaccine has been approved for prevention of cervical cancer in 2006. Since then, a post-licensure safety

surveillance analysis revealed a reported rate of 0.2 events per 100 000 doses of vaccine for Guillain–Barre Syndrome, 0.2 for autoimmune disorders and 0.04 for transverse myelitis [5]. Although syncope was the most common adverse effect of Gardasil, with a reported rate of 8.2 events per 100 000 doses, POTS has not been identified as an adverse event in this analysis. However, it is probable that some patients who develop POTS after immunization with Gardasil or other vaccines are simply undiagnosed or misdiagnosed, which leads to under-reporting and a paucity of data on the incidence of POTS after vaccination in literature.

To date, this is the first case report describing POTS after vaccination with Gardasil. Given an increased prevalence of POTS in young women and an indication for vaccination with Gardasil in the same patient population, physicians should be aware of a possible association between vaccination with Gardasil and *de novo* POTS.

References

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