

Psychogenic Gait Disorders after Mass School Vaccination of Influenza A

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Background and Purpose: Psychogenic movement disorders (PMD) after war or mass vaccination was reported and well known disease entity already. However, we have seldom been met those patients because we don't have any chance to experience of those events. Recently, influenza A (H1N1) spreads around world, and many countries have a program of mass vaccination of H1N1. Although PMD in adult is well characterized, childhood-onset PMD has not been extensively studied. **Case Reports:** We present four children of psychogenic gait disorders (PGDs) after mass school vaccination of H1N1. They had fluctuating weakness and their prognosis was good. We confirmed all patients as PGD by placebo. **Conclusions:** Our four cases have two common characteristics. One is that all were young and their prognosis was good. And the other is that all were induced their abnormal gait symptoms after mass school vaccination. We observed that mass PMD has a different characteristics comparing to personal PMD, and PMD in children is differ from adult onset PMD.

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Since the World Health Organization (WHO) announced their first patient on April 24th 2009, influenza A (H1N1) has spread around world.¹ In Korea, mass vaccinations to school aged children began in November, 2009. Adverse effects related to this, included dizziness, syncope, and other neurological complaints. Despite these minor complaints, we found no reports of serious adverse effects of the H1N1 vaccine.

Although many literatures described clinical features and natural history of adult patients with psychogenic movement disorders (PMD), there has been a little attention in children. Herein, we observed four cases where young patients developed psychogenic gait disorder (PGD) following the mass H1N1 vaccination in school, and discuss the differences between mass PMD and personal PMD, childhood PMD and adult PMD.

Case Reports

Case I

A twelve-year-old boy consulted a pediatrician, due to the sudden onset of gait difficulty. Three days before his admission, he had received the H1N1 vaccine at his school. Two days after his vaccination, he complained to his mother about difficulty walking. His past medical history was not remarkable. On neurological examination, no abnormalities were apparent other than mild motor weakness in both legs, albeit fluctuating. Further investigation revealed that when walking, both of his knee would buckled; however, not enough for him to fall. Routine laboratory results were within the normal limits. He was taken for a thoracic MRI and nerve conduction study (NCS), both of which were normal. We then injected 1 mL of normal saline into the antecubital vein. After five minute, his abnormal gait had improved completely, an effect which lasted for 10 minutes. Thirty minutes following the injection, the buckling of his knees reappeared. He was referred to a psychiatrist and his symptoms disappeared following psychotherapy.

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Case II

A 14-year-old girl with sudden onset of gait difficulties visited our clinic. She had received the H1N1 vaccine in school. The following evening, she had complained of left side weakness. She had no past medical and psychiatric history. Upon neurological examination, she had no facial weakness or dysarthria; however, she did display motor power as MRC grade IV in the left upper and lower extremities. Deep tendon reflexes were normal and although she had displayed a limping gait during walking, she didn't fall down. When we performed the Hoover test on both legs, the heel of the supposed paralyzed leg pressed down on our palm. Further routine laboratory results were within the normal limits and brain MRI and NCS were also normal. Based on her history and MRI findings, we gave her a placebo injection. Ten minutes after injection, her left side weakness had improved and she was able to walk normally (see Video segment 1). The next day, she complained of a newly developed tremor of 2-3 Hz in her left hand and a persistent limping gait; however, the tremor was disappeared, during concentration while calculating or performing complex movements. After psychiatric counseling, she was discharged free from symptoms.

Case III

A 12-year-old boy visited our clinic, due to the sudden onset of extremely slow gait. His symptom developed seven days after receiving the H1N1 vaccination at school. Although he complained of a slowing gait, he could walk without assistant. He had been experiencing fluctuating weakness in his legs; however, he had no facial palsy or dysarthria. He had no past medical and psychiatric history. On neurological examination, his motor power was measured as MRC grade IV in the right lower extremities. Deep tendon reflex was normal and he had no sensory deficits. When he was walking, his gait was very slow but he didn't fall. An MRI on thoracic and lumbar areas and an NCS were not remarkable. His routine laboratory results were also within the normal limits. His symptoms improved following a placebo injection (see Video segment 2) and he was subsequently referred to a psychiatrist. After two days of consultation, his left side weakness had improved and he was discharged without incident.

Case IV

A 12-year-old girl presented because of gait difficulty. She

felt a weakness of four extremities suddenly, after two weeks of H1N1 vaccination. Due to her weakness, she was admitted to Pediatric department and has taken care in intensive care unit. Three days after admission, her weakness was getting improved. One week after admission, she felt her gait difficulty, despite her weakness was improved. She had no past medical and psychiatric history. Neuroimaging of the brain was normal, and an NCS were not remarkable. Her routine laboratory results, including cerebrospinal fluid were within the normal limits. Her neurological examination revealed sudden buckled of her knee when she was walking. However, she had no weakness and sensory changes in her extremities. Her abnormal gait was fluctuated according to her concentration. Based on her fluctuating abnormal gait symptom, we gave her placebo injection. After injection, her abnormal gait was improved during our suggested time.

Demographics and clinical characteristics are summarized in Table 1. We obtained informed, written consent from all patients after they had received a complete description of our intended use of their video clips.

Discussion

Considering our patients' histories and clinical examinations, it was relatively easy to make a diagnosis of PGD. Their symptoms had occurred suddenly and they had all displayed fluctuating weakness after the vaccine injection. Also, they had all improved after a placebo injection and had all rapidly improved through psychiatric treatment. Interestingly, they had exhibited gait disturbance with variable time intervals ranging from several hours to 21 days following the mass school H1N1 vaccinations. Our patients had variable types of gait, including knee-buckling, extreme slowing, and limping. It should be noted that sudden knee-buckling or extreme slowing without falling is a common pattern of PGD.²

About 90% children with PMD had somatic and neurological complaints, including headache, fatigue, numbness, weakness, etc, associated with PMD and those are more than adult.³ In PMD, children has different clinical manifestations comparing to adults.^{3,4} Gait disturbance is more common in childhood onset PMD, the dominant side is more affected, concomitant organic MD and psychiatric comorbidity including depression and anxiety, is rare than adults.^{3,4} Our all patients complained weakness or sensory changes as initial symptom.

Table 1. Demographic and clinical features of our four patients

Patients	G/A	MO	Sx onset after Vacc.	Fluctuation	Subjective Sx	Gait pattern	Prognosis
Case I	M/12	Sudden	2 days	Yes	Weakness	Buckling of knee	Full recovery
Case II	F/14	Sudden	Several hours	Yes	Weakness, tremor	Limping gait	Full recovery
Case III	M/12	Sudden	7 days	Yes	Weakness	Extremely slowing	Full recovery
Case IV	F/12	Sudden	14 days	Yes	Weakness	Buckling of knee	Full recovery

GA: gender/age, MO: mode of onset, Sx: symptom, Vacc.: vaccination

In general, as our patients, children with a shorter disease duration prior to diagnosis (< 1 month) have an excellent prognosis.⁴

Mass psychogenic illness can be seen in patients after mass vaccination or during war.⁵ It can affect all classes and age groups, although the young are thought to be more vulnerable, and may be easier to manage than individual PMDs.⁶ Symptoms suggestive of this illness are headache, nausea, dizziness, hyperventilation, fainting, and relapse of illness.⁷

In this report, all our patients involved young children who had complained of weakness. Further, all responded well to treatment and recovered completely with encouragement. We suggest that PMDs after mass school vaccinations must be excluded in those patients (especially younger), who exhibit inconsistent weakness or other abnormal movements.

Legend to the Video

Segment 1

A 14-year-old girl showed a limping gait during walking due to weakness in the left leg. However, ten minutes after injection, her left side weakness had improved and she was

able to walk normally.

Segment 2

A 12-year-old boy showed extremely slowing movement, including limping gait. After placebo injection, his movement was fast and abnormal gait was improved.

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