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Case Report

Rapid Onset of Guillain Barré Syndrome following Quadrivalent Human Papilloma Virus Vaccination in a Young Female: A Case Report

Onyinye Elizabeth Mbata* and Prince Marvellous Atiku

Occupational Health and Safety Expert, PUCE, Aurelio Davilas and Antonio Solano de Salas Avenues, Quito-Ecuador

***Corresponding author**

Onyinye Elizabeth Mbata, Occupational Health and Safety Expert, PUCE. Aurelio Davilas and Antonio Solano de Salas Avenues, N5-572, Santa Rosa, Tumbaco, Quito-Ecuador, Tel: 593989343012

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Abstract

Guillain-Barré Syndrome is a rare autoimmune disorder affecting the peripheral nervous system, causing muscle weakness, numbness, and loss of reflexes. We report a 12-year-old girl who developed Guillain-Barré Syndrome after receiving the second dose of the quadrivalent human papillomavirus vaccine Gardasil (Recombinante tetravalente MERCK & CO, INC, Whitehouse Station USA). Within an hour, she experienced stomach pain, nausea, and dizziness. Three hours later, she developed ankle pain, numbness, and leg immobility. Examination revealed are flexia, numbness, and tachycardia. Magnetic Resonance Imaging showed slight inflammation of the lower spinal nerves, lumbar puncture was normal. Intravenous immunoglobulin treatment (Panzyga 100mg/ml Octapharma Ltd., Manchester, United Kingdom) was initiated, leading to gradual improvement. Physiotherapy began and she was discharged on day five. After six weeks, mobility improved, though numbness persisted. This case highlights the importance of early recognition and treatment to prevent severe complications.

INTRODUCTION

Guillain-Barré Syndrome (GBS) is a rare, acute autoimmune disorder characterized by rapid-onset muscle weakness, paresthesia, and absent deep tendon reflexes. With an incidence of 0.8 to 1.9 cases per 100,000 persons per year, it poses a significant clinical concern due to its potential severity. While two-thirds of cases follow a gastrointestinal or respiratory infection, the link between GBS and vaccines remains debated [1]. The most clearly demonstrated vaccine-associated GBS cases occurred after the 1976 swine influenza vaccine [2]. However, this report details a rare instance of GBS developing within four hours of administering the second dose of the quadrivalent Human Papillomavirus (HPV) vaccine (Gardasil) in a 12-year-old girl. This case underscores the need for awareness and further investigation into potential vaccine-related triggers.

CASE PRESENTATION

A previously healthy 12-year-old Caucasian female received the second dose of the quadrivalent HPV vaccine (Gardasil) as a 0.5mL intramuscular injection in her non-dominant arm. She had tolerated the first dose six months earlier without adverse effects.

Within one-hour post-vaccination, she experienced stomach pain, nausea, headache, and dizziness, symptoms initially considered common post-vaccine reactions. However, three hours later, she developed bilateral ankle pain, paresthesia, and leg immobility. Examination revealed absent deep tendon reflexes below the knees, numbness, and paralysis. Reflexes and sensitivity above the knees were intact, suggesting a localized neurological dysfunction.She had no preceding infections, autoimmune disorders, or medical conditions predisposing her to GBS. Her vitals showed tachycardia and mild systolic hypertension, prompting urgent transfer to a specialized hospital. Upon arrival, a detailed neurological assessment confirmed muscle weakness, absent reflexes, and persistent paresthesia. Despite these symptoms, her Glasgow Coma Scale score remained 15/15, indicating normal cognitive function. Given the acute onset and symptom progression, a presumptive diagnosis of GBS was made. Laboratory tests were unremarkable. Spinal MRI revealed slight cauda equina enhancement, a finding consistent with nerve root

inflammation. A Lumbar Puncture (LP) was performed, but Cerebrospinal Fluid (CSF) analysis was normal, lacking the elevated protein levels typical of GBS. However, early-stage GBS may not always show albuminocytologic dissociation. Intravenous Immunoglobulin (IVIG) therapy was initiated at 2g/kg alongside supportive hydration. On day two, the patient remained conscious, but mild hypotension developed. Sensitivity returned to the sole of her right foot, with urine output at 0.5mL/kg/h. By day three, IVIG therapy concluded, and she was transferred from the ICU to the pediatric ward. Twice-daily physiotherapy began, leading to mild mobility in her toes and left ankle. Urine output increased to 1.6mL/kg/h. On day four, mild motor and sensory improvements continued. She remained unable to walk, though she could slightly move her toes and left ankle. By day five, she was discharged with instructions for daily physiotherapy and weekly neurological follow-ups. At discharge, she exhibited normal dorsiflexion in her left foot and right toes, with mild sensitivity in the right foot sole but persistent immobility. Follow-up electromyography (EMG) and nerve conduction studies were unremarkable, which is atypical for GBS but may indicate a milder or slowly progressing variant. The final diagnosis was acute demyelinating polyneuropathy consistent with GBS. By six weeks, she regained substantial mobility, though numbness persisted. Patient regained sensitivity 16 weeks after HPV vaccine administration.

Informed consent was obtained from the parent of the patient reported in the case report.

DISCUSSION

This case highlights a rare occurrence of GBS shortly after HPV vaccination, raising concerns about potential post-vaccine neurological complications. While epidemiological studies from the United States, France, and Scandinavia have largely dismissed an association between GBS and HPV vaccines [3], this case presents an unusually rapid onset within hours of vaccination, differing from the typical days-to-weeks latency seen in post-vaccine GBS cases.

The HPV vaccine has significantly reduced cervical intraepithelial neoplasia and anogenital warts. However, despite its efficacy, rare adverse effects like GBS warrant vigilance [4]. Reports to EudraVigilance have identified 248 suspected GBS cases linked to Gardasil, 47 to Gardasil-9, and 44 to Cervarix [5]. These data suggest a need for continued pharmacovigilance and research.

GBS typically follows infection with Campylobacter jejuni, yet this patient lacked a preceding illness. The immediate symptom onset post-vaccination strengthens the hypothesis of a direct immunological response to the vaccine. Animal and clinical research since 1982 has suggested that demyelinating neuropathies can occur within 4-10 months post-vaccination [6], but the rapidity in this case is exceptional. This may indicate an acute immune-mediated response to vaccine components.

IVIG was critical in halting disease progression. Early intervention with IVIG likely played a crucial role in reducing nerve injury and producing clinical improvement by neutralizing pathogenic antibodies and inhibiting autoantibody-mediated complement activation [7]. However, despite standard immunotherapy, approximately 5% of GBS cases are fatal, and up to 20% of patients cannot walk independently one year after onset [8]. In this case, the patient fully regained mobility after two months and complete sensitivity after four months, demonstrating a relatively favorable prognosis. Clinicians should remain vigilant for early GBS signs post-vaccination, as rapid diagnosis and treatment significantly impact outcomes. The early identification and management of GBS are essential to preventing severe complications, including permanent neurological damage and fatality, especially since GBS has the potential to be fatal because it can induce respiratory difficulties and almost complete paralysis [9]. While vaccines remain overwhelmingly safe, this case underscores the importance of ongoing monitoring and research into rare but serious adverse effects. This case contributes to the growing body of evidence on potential vaccine-related GBS triggers, emphasizing the need for increased awareness and prompt intervention. While large-scale studies have not confirmed a definitive HPV-GBS link, rare cases like this warrant further research to enhance vaccine safety monitoring and risk mitigation strategies. Recognizing and managing GBS early is critical to preventing severe complications and ensuring patient safety.

Conflict of Interest

The contributing authors have no financial or nonfinancial competing interests.

Authors Contribution

Onyinye Elizabeth Mbata M.D. led the investigation of the case. Onyinye Elizabeth Mbata M.D. and Prince Marvellous Atiku M.D. both carried out the analysis, interpretation and writing of the paper.

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