Case report

Vaccine hesitancy with a history of Guillain Barre Syndrome: Weighing the risks and benefits of SARS-CoV-2 vaccination☆

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ABSTRACT

Since the beginning of the COVID-19 pandemic, great hesitancies regarding the COVID-19 immunization have existed. The most striking adverse events reported include thrombosis with thrombocytopenia syndrome (TTS), myocarditis, and Guillain Barre Syndrome (GBS). Post-vaccination GBS is known since the time of Influenza vaccination, but several cases of GBS have also been reported in the current COVID-19 vaccination era. As a result, our patient with a history of GBS post-Influenza vaccination, went unvaccinated for SARS-CoV-2, due to fear of GBS re-activation. Consequently, he contracted COVID-19 pneumonitis complicated with deep venous thrombosis, requiring a prolonged hospitalization. Weighing the risks and benefits of vaccination to COVID-19 is difficult, especially for people with a previous history of GBS related to Influenza vaccination. We reviewed and analyzed the reported cases of GBS temporary related to COVID-19 vaccination to determine the safety of their administration in those with a history of GBS.

Introduction

Guillain Barre Syndrome (GBS) is an acute inflammatory demyelinating polyradiculoneuropathy that occurs after viral infections and vaccinations by temporal association at a frequency of 0.6–4/100,000 person/year worldwide [1]. The most common immunization that can cause an adverse event of GBS is Influenza vaccine. Yet, a study reviewing GBS cases during the Influenza seasons in 1992–1993 and 1993–1994, found an adjusted relative risk of 1.7 cases per 1 million Influenza vaccinations [2]. Hereby, we highlight a patient’s choice of not being vaccinated against SARS-CoV-2 and that decision resulted in him having a severe COVID-19 pneumonitis requiring hospitalization. The risk of GBS post vaccination should’ve been weighed to the benefit of having received COVID-19 vaccination. COVID-19 vaccination decreases the probability of becoming infected and decreases hospitalization and mortality [3]. During the recent Delta variant surge, greater than 95% of hospitalized patients were unvaccinated [4]. The risk-benefit ratio becomes more of a dilemma to the general population, when they have experienced an adverse event from immunization. We present the case reports of temporary related GBS to COVID-19 vaccination highlighting the inadequacy of current retrospective reports to urge patients away from obtaining vaccinations.

Case presentation

A 71-year-old Caucasian male with a past medical history of hypertension, hyperlipidemia, atrial fibrillation (status-post ablation), obstructive sleep apnea and obesity, presented to Mayo Clinic, Jacksonville. He also had an episode of Guillain-Barre Syndrome (GBS) temporary related to Influenza vaccination several years ago. All symptoms of GBS had resolved with physiotherapy and the patient had declined the COVID-19 vaccine due to this history of GBS. He was diagnosed with COVID-19 pneumonia in an outside hospital and was subsequently transferred to Mayo Clinic.

His COVID-19 symptom onset was two weeks prior to the hospitalization, and started with cough, fever, and mild diarrhea. Due to his worsening shortness of breath, cough, and fever with chills, he was admitted to a local hospital. A nasopharyngeal polymerase chain reaction done there for SARS-CoV-2 returned positive. He was diagnosed with COVID-19 pneumonia with acute hypoxic respiratory failure and subsequent acute respiratory distress syndrome (ARDS). There, he was treated with oxygen via a high-flow nasal cannula (HFNC), five days of Remdesivir, and dexamethasone 6 mg daily. He

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developed a right peroneal deep vein thrombosis (DVT) and received enoxaparin 1 mg/kg BID for the same. After seven days of hospitalization, he was airlifted to Mayo Clinic due to progression of the disease and concerns for cytokine storm and worsening respiratory failure.

On admission to the intensive care unit, his vital signs were as follows: a blood pressure of 147/90 mmHg, a heart rate of 73 beats/minute, a basal metabolic index of 32.8 kg/m2, a respiratory rate of 16/minute, a temperature of 36.9 °C and an oxygen saturation of 90% on HFNC 50 liters per minute and 60% FiO2. His laboratory results showed an elevated D-dimer (1613 ng/ml), due to which a computed tomography angiography was ordered which returned negative for pulmonary embolism (PE). He had mild thrombocytosis (396 * 10^9/L), high C-reactive protein (CRP) (73.8 mg/L), lactate dehydrogenase (309 U/L), interleukin-6 (16 pg/ml), ferritin (1430 ng/ml) and procalcitonin (0.142 ng/ml) levels. Chest x-ray was consistent with COVID-19 pneumonia.

He was stabilized on oxygen with HFNC. Remdesivir was extended to a ten-day course, Dexamethasone was increased to 20 mg for 5 days followed by 10 mg for 5 days, and a five-day course of antibiotic treatment for suspected nosocomial pneumonia with Levofloxacin and Zosyn were given for suspected superimposed bacterial pneumonia. Infectious Diseases (ID) and Neurology consultations were obtained to discuss the safety of COVID-19 vaccination. After five days of close monitoring, he was weaned to room air and his oxygen saturation was stable at 92–94%. The patient was discharged after eight days of hospitalization, and his medications included Apixaban, a Dexamethasone taper with regular blood glucose monitoring, and Trimethoprim/Sulfamethoxazole for Pneumocystis carinii pneumonia prophylaxis while on steroid taper. He was advised to receive a mRNA COVID-19 vaccine series in ninety days.

Discussion

Several studies show that unvaccinated patients are at higher risk of getting severe COVID-19 infection than those vaccinated, especially when it comes to elderly population with multiple co-morbidities [5]. Our patient feared getting GBS in context of his prior history, more than getting COVID-19 infection. This case highlights the difficulty of weighing the risks and benefits of vaccination especially when a vaccine-related event exists in one's history.

Table 1 shows a PUBMED literature review of reported incidences of GBS after COVID-19 vaccination with various vaccine types given across the world [6–31]. We included CDC and WHO analyses of larger population groups. With these limited data, Vaxzevria/AstraZeneca/Covishield seem to be most temporary related to GBS cases post-vaccination. In the United States, Janssen vaccine, by Johnson & Johnson, has more reported cases of GBS. However, no study has shown a statistically significant increase of GBS after administration of any of these vaccines [32]. A study by Garcia-Grimshaw et al. demonstrates an incidence of 0.18/100,000 of GBS in a large Hispanic cohort within 30 days of receiving the first dose of Pfizer vaccine [33]. Another large-scale study by Shapiro Ben David et al. specifically demonstrated the minimal risk of GBS after vaccination with Pfizer vaccine, in patients with a prior history of GBS [26]. These studies show that Pfizer vaccine imposes only minimal risk of GBS in general population as well as in people with a prior history of GBS. Similarly, only one case of GBS post-vaccination has been reported with Moderna, based on our literature review. Two studies, where GBS was reported with unknown forms of COVID-19 vaccines reported in our table, lack vaccine manufacturer data, and do not add significantly to the results. Hence, we show that case reports and a few studies do report onset of GBS related in a temporal fashion to COVID-19 vaccination. A few studies do show minimal risk of developing GBS post vaccination. No study was a case-matched real-world study directly comparing the incidence of GBS compared to the general population or comparison of one COVID-19 vaccine manufacturer to another. Also, no study determined if an increased risk of GBS post COVID-19 vaccination existed in presence of a prior history, compared to the general population. With these limited data, the education of an individual with a history of GBS hesitant to obtain a COVID-19 immunization must be shared. It should be highlighted to the patients that, although, a few cases of GBS related to COVID-19 vaccination have been reported, no head-to-head study comparing vaccine manufacturers have been done. Moreover, an assessment of their personal risk of acquiring COVID-19 infection should be explained to them. Subsequently, the risk of acquiring a rare complication to COVID-19 vaccination, to their risk of becoming seriously infected by COVID-19 [34] must be carefully established using the value system of the patient.

In conclusion, Fortunately GBS related to COVID-19 vaccination is a rare event for the general population. For those, as the presented case, with a GBS history, minimal data exists to access if an increased risk of GBS exists or not. The key in managing such patients is educating them on the current likelihood of GBS occurring in the population and assist them in balancing that information with the risk of them having a severe case of COVID-19 infection, if acquired.

Conflict of Interest

Authors declare no Conflict of Interest.
