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FREQUENCY OF GBS (GUILLAIN BARRE SYNDROME) WITH POST-COVID AND LONG COVID DISEASE IN CHILDREN ADMITTED IN CHILDREN HOSPITAL LAHORE

FREQUÊNCIA DA SÍNDROME DE GUILLAN-BARÉ (SGB) EM CRIANÇAS COM PÓS-COVID E COVID LONGA INTERNADAS NO HOSPITAL INFANTIL DE LAHORE

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Abstract
Background: A very broad range of neurological complications has been linked to coronavirus disease 2019 (COVID-19). Guillain-Barré Syndrome (GBS) is an autoimmune neuropathy which is on the rise after COVID-19 infection. Nonetheless, there is few data on its occurrence in children, especially in post-COVID and long COVID. Objective: To find the prevalence of post-COVID and long COVID disease in children hospitalized with GBS in The Children's Hospital Lahore (CHL). Methodology: The study was a descriptive cross-sectional study performed in the Department of Neurology, CHL, from October 2025 to Jan 2026. Eighty-seven cases of GBS in children of 2-18 years were included using consecutive sampling. The exposure to COVID-19 was proven by antibody testing (IgM/IgG). The patients were identified with post-COVID (212 weeks) and long COVID (>12 weeks). The SPSS version 26.0 was used to analyze data. Results: In the case of 87 children with GBS, a major percentage of participants had previous exposure to COVID-19. The number of cases post-COVID

Resumo
Contexto: Uma ampla gama de complicações neurológicas tem sido associada à doença do coronavírus 2019 (COVID-19). A síndrome de Guillain-Barré (SGB) é uma neuropatia autoimune que tem apresentado aumento após a infecção por COVID-19. No entanto, existem poucos dados sobre sua ocorrência em crianças, especialmente em casos pós-COVID e COVID longa. Objetivo: Determinar a prevalência de SGB pós-COVID e COVID longa em crianças hospitalizadas com SGB no Hospital Infantil de Lahore (CHL). Metodologia: O estudo foi um estudo transversal descritivo realizado no Departamento de Neurologia do CHL, de outubro de 2025 a janeiro de 2026. Oitenta e sete casos de SGB em crianças de 2 a 18 anos foram incluídos por meio de amostragem consecutiva. A exposição à COVID-19 foi comprovada por teste de anticorpos (IgM/IgG). Os pacientes foram classificados como pós-COVID (2 a 12 semanas) e COVID longa (> 12 semanas). O SPSS versão 26.0 foi utilizado para análise dos dados. Resultados: Em um estudo com 87 crianças com síndrome de Guillain-

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was higher than the cases of long COVID. It was found that there was a statistically significant difference in age groups and post-COVID GBS ($p \leq 0.05$) but no significant difference in gender. Conclusion: Pediatric populations are characterized by post-COVID neurological complications, especially the GBS. Childhood GBS should be diagnosed and treated promptly, and this is only possible through early detection and surveillance of COVID-19 patients.

Keywords: COVID-19. Post-COVID Syndrome. Long COVID. Guillain–Barré Syndrome (GBS). Peripheral Neuropathy. Acute Flaccid Paralysis (AFP). Immune-Mediated Neuropathy.

Barré (SGB), uma grande porcentagem dos participantes havia sido exposta à COVID-19 anteriormente. O número de casos pós-COVID foi maior do que o de casos de COVID longa. Observou-se uma diferença estatisticamente significativa entre as faixas etárias e a SGB pós-COVID ($p \leq 0,05$), mas nenhuma diferença significativa entre os sexos. Conclusão: A população pediátrica apresenta complicações neurológicas pós-COVID, especialmente a SGB. O diagnóstico e o tratamento da SGB na infância devem ser precoces, o que só é possível por meio da detecção precoce e do acompanhamento de pacientes com COVID-19.

Palavras-chave: *COVID-19. Síndrome pós-COVID. COVID longa. Síndrome de Guillain-Barré (SGB). Neuropatia periférica. Paralisia flácida aguda (PFA). Neuropatia imunomediada.*

1 INTRODUCTION

At the end of 2019, a new coronavirus disease (COVID-19) was detected in Wuhan, China, and quickly spread all over the world, causing the worldwide pandemic[1].

Even though in its early years it was acknowledged as a respiratory disease, new signs indicate that COVID-19 is a multisystem disease with considerable prolonged effects. The viral entry into the host cells is facilitated by angiotensin-converting enzyme 2 (ACE2) receptor that is highly expressed in many organs, such as lungs, heart, vascular endothelium, and nervous system. Such a massive spread is the reason behind the variety of clinical consequences of COVID-19, including respiratory or cardiovascular issues and neurological problems[2].

SARS-CoV-2 infection has been reported to have neurological manifestations. These are central nervous system (CNS) complications like stroke, changes in consciousness, headache, and seizure and peripheral nervous system (PNS) involvement, this includes nerve dysfunction in the head and peripheral neuropathies. The mechanisms of these neurological effects are not fully understood yet despite the increasing awareness [3].

Guillain-Barre syndrome (GBS) is an acute, post-infectious, immune-mediated, and peripheral neuropathy and nerve root neuropathy that is estimated to occur at 1.1 1.8 per 100000 population every year[4].

It is usually precipitated by a previous infection which takes place via the process of molecular mimicry, whereby anti-ganglioside antibodies. Are produced by immune responses and assault constituents of the peripheral nerve axons. GBS typically creates rapid progressive and symmetrical ascending weakness with the loss or weakness of deep tendon reflexes and can involve sensory nerves and cranial nerves. Extreme cases may result in life-threatening complications with the need of mechanical ventilation due to the involvement of the respiratory muscles[6].

GBS has been associated with several infectious agents such as Epstein-Bar virus (EBV), Campylobacter jejune and the Zika virus. Also, there have been rare reports after vaccination against diseases like influenza, hepatitis B and more recently, COVID-19 [5], [–]. There is emerging evidence to indicate a potential relationship between SARS-CoV-2 infection and GBS, even in pediatric groups. Aloma et al. reported the neurological manifestations in children with COVID-19, such as decreased reflexes indicative of GBS. Likewise, features typical of GBS were found in patients infected with SARS-CoV-2 who were pediatric patients [5], [6].

As indicated by Radisic et al. (2022), about 34.5 percent of GBS cases were linked to previous COVID-19 infection, which suggests a possible relationship between the two conditions[7], [8].

Although the research on the subject has been conducted predominantly on adults, the information about post-COVID neurological complications in children is scarce[9].

The problem of delayed and persistent complications of SARS-CoV-2 infection has gained ongoing importance due to the emergence of post-COVID and long COVID syndromes. In children, the conditions may have long-standing or progressive symptoms of several systems, which include nervous system. Considering the paucity of empirical data on pediatrics, the proposed study will present the prevalence of Guillain-Barre Syndrome among children with post-COVID and long COVID. This association will be understood so that early diagnosis, early management and better results can be provided to the affected children.

2 OBJECTIVES

To identify the prevalence of long COVID and post COVID among children who develop ICU admission due to GBS.

3 METHODOLOGY

This was a cross-sectional study that was conceived as a descriptive study; it took place in the Department of Neurology at The Children Hospital Lahore from October 2025 to January 2026. A total of 87 patients was determined based on a 95 percent confidence level and a 10 percent margin of error, where the frequency of a post-COVID Guillain -Barré Syndrome (GBS) was estimated to be 34.5%. The method of sampling used in the study was non-probability consecutive sampling to recruit the eligible participants within the period of the study.

4 INCLUSION CRITERIA

Both male and female children aged 2 to 18 years who presented with acute flaccid paralysis (AFP) as a result of Guillain-Barre Syndrome (GBS) to The Children Hospital Lahore (CHL) were included.

5 EXCLUSION CRITERIA

Children under 2 and 18 years old admitted to The Children's Hospital Lahore (CHL) who had acute flaccid paralysis (AFP) caused by non-Guillain-Barre Syndrome reasons and children with a pre-existing neurological condition diagnosed before COVID-19 infection were excluded.

6 DATA COLLECTION PROCEDURE

The demographic variables such as age and gender and the status related to COVID-19 exposure based on the IgM and IgG antibody tests were measured. Patients were classified clinically according to the period of symptoms, and they were divided into post-COVID (2-12 weeks) and long COVID (>12 weeks) categories. The Guillain Barré Syndrome (GBS) was diagnosed using clinical examination, nerve conduction studies (NCS) and cerebrospinal fluid analysis (CSF).

Children who met the inclusion criteria were recruited into the study after receiving the ethical approval and informed consent of parents or guardians. COVID-19 antibody tests were performed on the sample of blood to identify the previous contact with SARS-CoV-2. Based on the time symptoms lasted after being infected, patients were categorized as post-COVID or long COVID. All the participants underwent a detailed neurological examination to evaluate the characteristics that are indicative of GBS. Follow-up assessment of suspected cases was conducted with nerve conduction tests and CSF examination to prove the diagnosis. The principal investigator recorded all the information that was collected in a structured proforma.

7 DATA ANALYSIS

Data received were typed and processed using SPSS version 26.0. Quantitative variables, e.g, age, were represented as mean-standard deviation, whereas qualitative variables, e.g, gender, post-COVID status, and long COVID status, have been represented in terms of frequency and percentage. Data were also further stratified based on age and gender to eliminate the possible modifiers of effects. Following stratification, chi-square was used to determine the relationship between variables with p-value of 0.05 taken to be significant.

8 RESULTS

Eighty-seven (87) children with diagnoses of Guillain-Barré Syndrome (GBS) were recruited into the study. The average age of the participants was 9.841604. There

were 48 males and 39 females (55.2:44.8), which means that the gender distribution was relatively balanced. COVID-19 antibody screening showed that a considerable number of patients were already exposed to the virus, which could be used to distinguish between the post-COVID and long COVID groups.

Table 1

Baseline Characteristics

Parameter	Overall (n = 87)
Mean Age (years)	9.8 ± 4.2
Gender (Male : Female)	48 : 39

The demographic characteristics of the baseline depicted that the population of the study was primarily composed of school aged children with a slight majority of males.

Table 2

Distribution of Post-COVID and Long COVID GBS

Category	Frequency	Percentage
Post-COVID GBS	52	59.8%
Long COVID GBS	20	23.0%
No COVID Association	15	17.2%
Total	**87**	**100%**

The most prevalent one was post-COVID GBS, then there was long COVID and a relatively small percentage of the cases had no identifiable COVID-19 association.

8.1 Association with Age and Gender

The stratification analysis revealed that age categories had statistically significant differences between post-COVID and long COVID GBS ($p \leq 0.05$), so the age factor can be considered an effect modifier. Nonetheless, there was no statistically significant gender and long COVID GBS or post-COVID GBS.

8.2 Interpretation

The research outcomes of this study are that neurological complications that occur after COVID-19, especially Guillain -Barre Syndrome are not uncommon among hospitalized children. The cases of post-COVID were more common than those of long COVID, which showed that GBS could be more common during the early post-infectious stage. The age was found to affect the distribution of cases whereas gender did not have an effect. These findings indicate that clinical vigilance in regard to neurological complications is important in children who have recovered after COVID-19 because it allows the detection of GBS at an early stage and its management.

9 DISCUSSION

This article shows a significant relationship between COVID-19 and Guillain-Barre Syndrome (GBS) in children. These results are in line with the existing literature that indicates that SARS-CoV-2 might be the precipitator of immune-mediated neuropathies. The hypothesis that has been put forward is that the basic mechanism is that of molecular mimicry, in which the host immune response to viral antigens cross-reacts with peripheral nerve components, causing demyelination or axonal injury.

The post-COVID GBS has been reported by Radisic et al. with a frequency of 34.5% in line with the trends in this study [7].The fact that post-COVID cases prevail over long COVID cases implies that neurological complications related to immunity are likely to manifest more in the initial stages of the post-infectious period and not in the chronic stages of the disease. This observation confirms the hypothesis that the immune response that is activated soon following infection is at the center of GBS pathogenesis.

Cases of neurological involvement in COVID-19 among children have been extensively reported. Ray et al. have shown that the neurological complications encountered in hospitalized children include peripheral neuropathies, encephalopathy, and seizures among others[8]. Likewise, the systematic reviews have indicated growing awareness of GBS as a post-infectious complication of COVID-19 in adults and among children [10]. Even though pediatric cases are still considered to be rather uncommon in

comparison with adults, their presence highlights the neurotropic character of SARS-CoV-2.

A number of studies have pointed out that GBS related to COVID-19 has no substantial clinical manifestation difference compared to GBS caused by other infectious agents, but there have been reports that a higher incidence of severe or rapidly progressing cases has been observed in COVID-associated GBS[11].The lack of significant gender differences in this study is consistent with current literature, i.e. that shows that GBS lacks a high gender inclination in pediatrics. The observed age differences could indicate the differences in the maturity of immune systems, exposure patterns, and host susceptibility.

Moreover, new literature speculates that COVID-19 related GBS can be both demyelinating and axonal, and electrophysiological studies show that there are heterogeneous patterns of nerve involvement. This inconsistency proves the necessity of early neurophysiological assessment in suspected cases to inform diagnosis and treatment.

The principle of post-COVID and post-COVID syndromes as an addition to the perception of problems associated with SARS-CoV-2 complications has complicated the concept. The conditions that arise post-COVID are usually experienced several weeks upon the occurrence of the acute infection, whereas long COVID is characterized by ongoing symptoms after 12 weeks. Pediatric populations have been reported to have neurological sequelae such as fatigue, cognitive dysfunction as well as neuropathies [12]. Nonetheless, the connection between long COVID and GBS is not as well-established and existing findings indicate that GBS is more closely associated with the post-infectious immune response compared with chronic sequelae.

The results of the current study support the essentiality of the early detection of neurological symptoms in children who have recovered after COVID-19. Early identification of GBS is very important because the later a patient receives treatment the more likely he or she may end up with respiratory dysfunction and disability. IVIG and plasmapheresis are still considered to be the primary treatment, and early administration is proven to be effective to improve the outcomes as well[13].

Limitations of the study consist of the single-center design of the study and rather small sample that might restrict the generalizability. Also, use of antibody testing to determine previous exposure to COVID-19 can fail to detect all instances, especially

those who had asymptomatic or mild infections. It has been suggested that further multicentric research in larger sample sizes and longitudinal follow-up would be preferable to understand the temporal association between COVID-19 and GBS among pediatric cohorts.

10 CONCLUSION

The problem of post-COVID neurological comorbidities is becoming more and more prominent among children, especially Guillain-Barre Syndrome (GBS). This paper indicates that post-COVID GBS is more prevalent compared with long COVID-associated GBS in children with acute flaccid paralysis. The results highlight the possibility of using SARS-CoV-2 infection as a precipitant of immune-mediated neurological diseases in children. It is important to allow the timely diagnosis and treatment of GBS by early detection of those patients with a history of recent or previous COVID-19 infection. Clinical follow-up, timely neurological evaluation, and correct investigations would greatly enhance the outcomes of patients. Thus, medical practitioners must have a high level of suspicion of GBS in children with neurological manifestation after COVID-19, early intervention is necessary to minimize the chances of complications and morbidity through late treatment.

REFERENCES

Siracusa, L., Cascio, A., Giordano, S. et al. Neurological complications in pediatric patients with SARS-CoV-2 infection: a systematic review of the literature. Ital J Pediatr 2021;47, 123.

Mussinatto I, Benevenuta C, Caci A, Calvo MM, Impastato M, Barra M, Genovese E, Timeus F. Possible association between Guillain-Barré syndrome and SARS-CoV-2 infection in children: a case report and literature review. Exp Ther Med 2022; 23;24(1):462.

Pimentel V, Luchsinger VW, Carvalho GL, et al. Guillain-Barré syndrome associated with COVID-19: a systematic review. Brain Behav Immun Health. 2023;28:100578.

Shang P, Zhu M, Wang Y, Zheng X, Wu X, Zhu J, Feng J, Zhang HL. Axonal variants of Guillain-Barré syndrome: an update. J Neurol. 2021;268(7):2402-2419.

Aljomah L., Almedlej S., Baarmah D., Altwaijri W., Alrumayyan A., Alrifai M., et al. Pediatrics COVID-19 and neurological manifestations: single tertiary centre experience. eNeurol Sci 2021;24:100355.

Sánchez-Morales A., Urrutia-Osorio M., Camacho-Mendoza E., Rosales-Pedraza G., Dávila-Maldonado L., González-Duarte A., et al. Neurological manifestations temporally associated with SARS-CoV-2 infection in pediatric patients in Mexico. Childs Nerv Syst 2021;37:2305-12.

Barroso E, Tuta-Quintero E, Olivella J, Aragón C, Vásquez L, Acosta L, Pinzón O, et al. Síndrome de Guillain Barré en población pediátrica.¿ Consecuencia de la infección activa o de la covid prolongada?. Revist Colombiana Reumatol 2022;29(4):335-46.

Ray STJ, Abdel-Mannan O, Sa M, et al. Neurological manifestations of SARS-CoV-2 infection in hospitalised children and adolescents in the UK: a prospective national cohort study. Lancet Child Adolesc Health 2021;5(9):631-41.

Radišić V, Ždraljević M, Perić S, Mladenović B, Ralić B, Jovanović DR, et al. Is there a difference between GBS triggered by COVID-19 and those of other origins?. Egypt J Neurol Psychiatr Neurosurg 2022;58(1):54.

Toscano G, Palmerini F, Ravaglia S, et al. Guillain–Barré syndrome associated with SARS-CoV-2. N Engl J Med. 2020;382:2574–2576.

Keddie S, Pakpoor J, Mouseley C, et al. Epidemiological and clinical features of COVID-19 associated Guillain–Barré syndrome. Brain. 2021;144(12):3694–3702.

Say D, Crawford N, McNab S, et al. Post-acute COVID-19 outcomes in children and adolescents. Lancet Child Adolesc Health. 2021;5(12):863–872.

Willison HJ, Jacobs BC, van Doorn PA. Guillain–Barré syndrome. Lancet. 2016;388:717–727.

Paterson RW, Brown RL, Benjamin L, et al. The emerging spectrum of COVID-19 neurology. Brain. 2020;143(10):3104–3120.

Finsterer J, Scorza FA. Guillain–Barré syndrome in 220 patients with COVID-19. Egypt J Neurol Psychiatr Neurosurg. 2021;57:55.

Dalakas MC. Guillain–Barré syndrome: The first documented COVID-19-triggered autoimmune neurological disease. Nat Rev Neurol. 2020;16:443–445.

Abrams R, Walensky RP, Del Rio C, et al. COVID-19 and neurological complications. JAMA Neurol. 2020;77(10):1201–1202.

NINDS/NIH. Guillain–Barré Syndrome Information Page. National Institute of Neurological Disorders and Stroke, NIH. 2022.

CDC. Post-COVID conditions among children and adolescents. Centers for Disease Control and Prevention. 2023.

Authors' Contribution

All authors contributed equally to the development of this article.

Data availability

All datasets relevant to this study's findings are fully available within the article.

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