http://www.banglajol.info/index.php/JNINB

Original Article

DOI: https://doi.org/10.3329/jninb.v10i2.83517

Journal of National Institute of Neurosciences Bangladesh,
July 2024, Vol. 10, No. 2, pp. 124-129

ISSN (Online) 2518-6612
ISSN (Print) 2410-8030

Sociodemographic Characteristics of Patients presented with Guillain Barre Syndrome: Experience at Referral Neuroscience Hospital in Bangladesh

Md. Zakirul Islam[1], Anjuman Ara[2], Md. Abdullah Yusuf[3], Rezaul Karim[4], Mohammad Enayet Hussain[5], Md. Merazul Islam Shaikh[6]

[1]Associate Professor (Medicine), National Institute of Neurosciences and Hospital, Dhaka, Bangladesh; [2]Assistant Professor, Department of Gynaecology & Obstetrics, TMSS Medical College, Bogura, Bangladesh; [3]Associate Professor, Department of Microbiology, National Institute of Neurosciences & Hospital, Dhaka, Bangladesh; [4]Associate Professor, Department of Medicine, Nilpharmary Medical College, Nilpharmary, Bangladesh; [5]Associate Professor, Department of Neurology, National Institute of Neurosciences and Hospital, Dhaka, Bangladesh; [6]Assistant Professor, Department of Neurophysiology, National Institute of Neurosciences and Hospital, Dhaka, Bangladesh

Abstract

Background: Guillain Barre Syndrome can occur in different group of people. **Objective:** The purpose of the present study was to see sociodemographic characteristics of patients presented with Guillain Barre Syndrome. **Methodology:** This cross-sectional study was conducted from October 2017 to September, 2018 in the Department of Clinical Neurology at the National Institute of Neurosciences and Hospital, Dhaka, Bangladesh. The patients were selected according to the selection criteria and after confirmation by electrophysiological study. Details socio-demographic variables of the study population were collected like age, gender, education, occupation, socioeconomic status and so one. Details history and meticulous examination were performed to collect the data according to the variable of interest. All necessary investigations were done at an optimum time. Nerve conduction study and CSF were done after 1st week of onset of the disease in the respective department of the institute. **Results:** A total number of 108 GBS patients were recruited for this study. Mean age of the study participant was 36.39 ± 16.03 years. Male was predominantly affected with a ratio of male and female in 2.4:1. Maximum patients were in the primary level of education which was 31(28.7%) cases. Highest number of cases were observed in the spring which was 43 (39.8%) cases. **Conclusion:** In conclusion middle age male patients are most commonly admitted in the hospital presented with GBS which are mostly occurs in Springs. *[Journal of National Institute of Neurosciences Bangladesh, July 2024;10(2):124-129]*

Keywords: Sociodemographic characteristics; Guillain Barre Syndrome; referral neuroscience hospital

Introduction

Guillain-Barré Syndrome (GBS) is an acute, immune-mediated disorder of the peripheral nervous system that presents with rapidly progressive limb weakness, areflexia, and varying degrees of sensory and autonomic dysfunction[1]. Though relatively rare, with an incidence of approximately 1 to 2 cases per 100,000 populations per year, Guillain Barre Syndrome is the most common cause of acute flaccid paralysis worldwide, especially in the era following the near-elimination of poliomyelitis[2]. Guillain-Barré Syndrome can affect individuals of all ages and genders, but certain sociodemographic trends have been consistently observed and are essential for understanding its epidemiology, risk factors, and healthcare implications[3].

Globally, Guillain-Barré Syndrome shows a clear male predominance, with a male-to-female ratio of approximately 1.5 to 2:1[4]. The reason for this gender disparity is not fully understood, but it may be linked to sex-related differences in immune responses and environmental exposure patterns. Additionally, the incidence of Guillain-Barré Syndrome increases with age, with the highest rates reported among individuals over 50 years of age[5]. However, in regions like South Asia and Latin America, a relatively higher proportion of

Correspondence: Dr. Md. Zakirul Islam, Associate Professor, Department of Medicine, National Institute of Neurosciences and Hospital, Dhaka, Bangladesh; Email: zakir.doc@gmail.com; Cell no.: +8801748994027;
ORCID: https://orcid.org/0009-0002-9772-7152

younger individuals, including children, have been reported to be affected, often with axonal variants like acute motor axonal neuropathy (AMAN), which tend to be more severe[6].

Socioeconomic and geographic factors also play a critical role in the distribution, recognition, and outcomes of Guillain Barre Syndrome. In low- and middle-income countries, delayed diagnosis, limited access to specialized neurology services, and suboptimal supportive care can result in poorer prognosis and higher mortality[7]. In rural areas, where access to tertiary care hospitals is limited, individuals often present late in the disease course, reducing the effectiveness of treatments such as intravenous immunoglobulin (IVIG) or plasmapheresis. Additionally, environmental factors, including poor sanitation and frequent exposure to gastrointestinal pathogens like Campylobacter jejuni, may contribute to the increased incidence of GBS in resource-limited settings[8].

Educational status, occupation, and income level have also been shown to indirectly influence the diagnosis and outcome of Guillain Barre Syndrome[9]. Individuals with lower educational attainment and limited health literacy may delay seeking care or fail to recognize early symptoms. Similarly, occupational exposure-particularly in agricultural and rural work environments-may increase contact with zoonotic and enteric pathogens, raising the risk of Guillain Barre Syndrome -triggering infections[10].

Bangladesh, a densely populated South Asian country, faces several challenges in addressing the burden of Guillain Barre Syndrome. Despite the availability of tertiary neuroscience referral centers in urban areas like Dhaka, a large portion of the population remains underserved, particularly in remote districts. Previous studies from Bangladesh have reported a relatively higher prevalence of the AMAN subtype and a younger average age of presentation compared to Western populations[11]. The underlying reasons may include higher prevalence of infectious triggers, inadequate early diagnosis, and delayed initiation of treatment.

There is a pressing need to generate detailed local data on the sociodemographic characteristics of GBS patients to guide public health interventions and clinical management strategies. A comprehensive understanding of how age, gender, occupation, socioeconomic status, and geographic location influence the incidence, severity, and outcomes of Guillain Barre Syndrome is essential for developing targeted awareness campaigns, improving early referral systems, and strengthening the neurological healthcare infrastructure in Bangladesh. The purpose of the present study was to see sociodemographic characteristics of patients presented with Guillain Barre Syndrome.

Methodology

Study Settings and Population: This cross-sectional study was conducted from October 2017 to September, 2018 in the Department of Clinical Neurology at the National Institute of Neurosciences and Hospital, Dhaka, Bangladesh. The patients were selected according to the selection criteria and after confirmation by electrophysiological study.

Study Procedure: Details socio-demographic variables of the study population were collected like age, gender, education, occupation, socioeconomic status and so one. Details history and meticulous examination were performed to collect the data according to the variable of interest. All necessary investigations were done at an optimum time. Nerve conduction study and CSF were done after 1st week of onset of the disease in the respective department of the institute.

Statistical Analysis: Statistical analysis was performed by Windows based software named as Statistical Package for Social Science (SPSS), versions 22.0 (IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp.). Continuous data were expressed as mean, standard deviation, minimum and maximum. Categorical data were summarized in terms of frequency counts and percentages.

Ethical Consideration: All procedures of the present study were carried out in accordance with the principles for human investigations (i.e., Helsinki Declaration) and also with the ethical guidelines of the Institutional research ethics. Formal ethics approval was granted by the local ethics committee. Participants in the study were informed about the procedure and purpose of the study and confidentiality of information provided. All participants consented willingly to be a part of the study during the data collection periods. All data were collected anonymously and analyzed using the coding system.

Results

A total number of 108 GBS patients were recruited for this study. Mean age of the study participant was 36.39 ± 16.03 years. About 73(67.6%) out of 108 cases were within 18 to 40 years of age (Table 1).

In this study, male was more commonly affected in GBS than female which was 76(70.4%) cases and 32(29.6%) cases respectively. Thus, male was predominantly affected with a ratio of male and female

in 2.4:1 (Figure I).

Table 1: Distribution of the Study Population according to Age (n=108)

Age Group	Frequency	Percent
18 to 40 Years	73	67.6
41 to 60 Years	28	25.9
More Than 60 Years	7	6.5
Total	**108**	**100.0**
Mean±SD	36.39 ± 16.03	

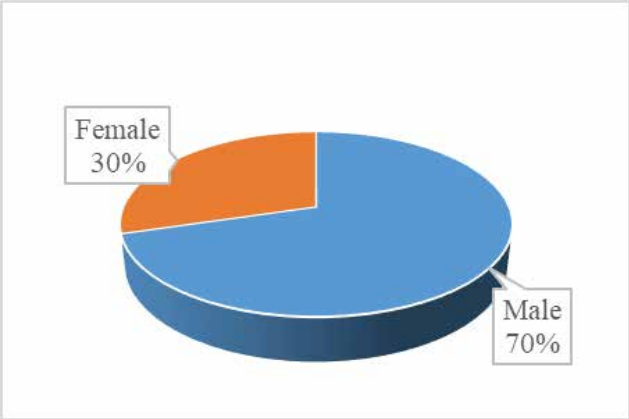

Figure I: Showing the gender distribution among study population (n=108)

Maximum patients were in the primary level of education which was 31(28.7%) cases followed by graduate, secondary education level and post graduate level whci was 25(23.1%) cases, 22(20.4%) cases and 13(12.0%) cases respectively (Table 2).

Table 2: Distribution of Study Population according to Education (n=108)

Educational Category	Frequency	Percent
Illiterate	6	5.6
Primary	31	28.7
Secondary	22	20.4
Higher secondary	11	10.2
Graduate	25	23.1
Post graduate	13	12.0
Total	**108**	**100.0**

Students, businessman and housewives were more commonly affected which were 26 (24.1%) cases, 17(15.7%) cases and 22(20.4%) cases respectively (Table 3).

People of high-income group affected more than middle- and low-income group which were 53(49.1%) cases, 27(25.0%) cases and 28 (25.9%) cases respectively (Table 4).

Table 3: Distribution of Study Population according to Occupation (n=108)

Occupation	Frequency	Percent
Service	24	22.2
Businessman	17	15.7
Students	26	24.1
Cultivator	7	6.5
Laborer	9	8.3
House wife	22	20.4
Others	3	2.8
Total	**108**	**100.0**

Table 4: Distribution of Study Population according to Monthly Income (n=108)

Monthly Income	Frequency	Percent
Less Than 10000 BDT	28	25.9
10000 to 20000 BDT	27	25.0
More Than 20000 BDT	53	49.1
Total	**108**	**100.0**

More cases were reported from urban than rural area which was 60(55.6%) cases and 48(44.4%) cases respectively (Figure II).

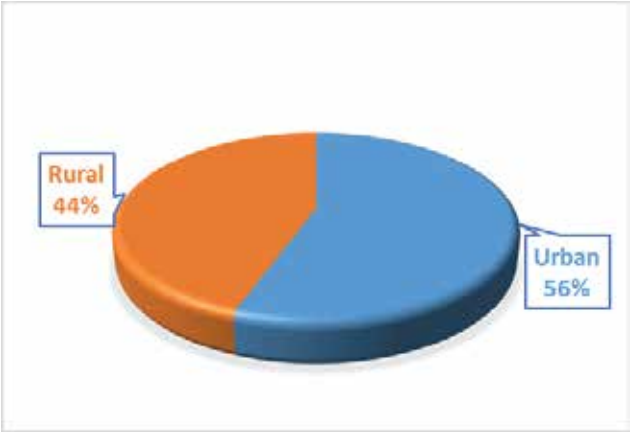

Figure II: Showing the distribution of residence among study population (n-108)

Highest number of cases were observed in the spring which was 43 (39.8%), in the summer number of cases were 40 (37.0%) (Figure III).

The nerve conduction study of the 108 cases of GBS patients in this study revealed that 55(50.9%) cases were demyelinating and 53(49.1%) cases were of axonal variety. In the axonal group only 2 cases were AMSAN and the remaining 51 cases of AMAN variety. The distribution is nearly equal in both group (Table 5).

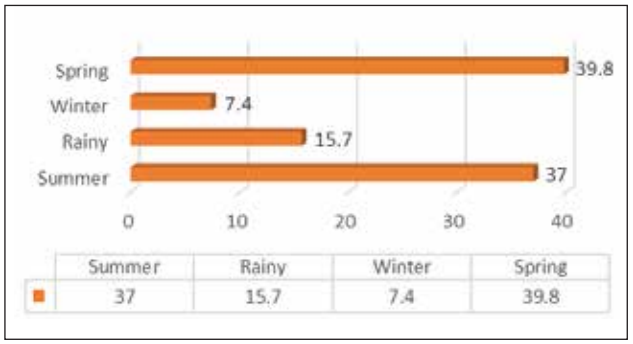

Figure III: Showing the Seasonal Variation of admission of GBS patients (n-108)

Table 5: Distribution of Study Population according to Electrophysiological Subtype of GBS (n=108)

GBS type	Frequency	Percent
Demyelinating	55	50.9
Axonal	53	49.1
• AMAN	51	
• AMSAN	2	
Total	**108**	**100.0**

AMAN: acute motor axonal polyradiculoneuropathy; AMSAN: acute motor sensory axonal polyradiculoneuropathy

Discussion

The main focus of this study is to observe the differences in various clinical parameters as well as the differences of clinical & electrophysiological outcome at 12 weeks of demyelinating and axonal variety of GBS. The study includes 50.9% demyelinating and 49.1% axonal subtypes of Guillain Barre Syndrome. Previous study[12] has demonstrated that there is a marked variation of Guillain Barre Syndrome worldwide with respect to clinical pattern, severity, electrophysiological subtypes and outcome. The predominant electrophysiological subtype is demyelinating throughout the world- 55% in Europe-America, 45% in Asia and in Bangladesh 40% cases[12]. Axonal Guillain Barre Syndrome is reported in 3.0% to 17.0% in Europe[13-14], 23.0% to 65.0% in Asia14 and up to 67.0% in Bangladesh[15]. The result of this study is consistent with that of other studies.

The mean age of participant is 40.20 ± 16.26 years and 32.43 ± 14.93 years among the demyelinating and axonal subtypes respectively. All over the world frequency of GBS increases with age. Similar age distribution was reported previously[11]. In Bangladesh, patients are younger than other parts of the world which is supported by a previous study[15] where mean age was 21 years, lower than the present study probably due to the inclusions of pediatric group of patients. In this study axonal patients are younger than demyelinating one which is also supported by previous study[12]. GBS incidence increases with age globally[11], a trend reflected in this study where mean ages were 40.20 ± 16.26 years for demyelinating and 32.43 ± 14.93 years for axonal cases. Similar age trends are reported by Doets et al[12]. Compared to global data, patients in Bangladesh tend to be younger. Previous research[15] found a mean age of 21 years, which is lower than in the current study—likely due to inclusion of pediatric patients in earlier studies. Moreover, axonal GBS patients in this study were significantly younger than demyelinating ones, which may be related to infection-induced onset common in younger, more active individuals.

Males are more frequently affected than female with a ratio ~2.4:1 (76:32); in demyelinating group it was around ~2:1 (36:19) and in axonal group it was around ~3:1 (40:13). Previous studies also reported higher male- female ratio[15-16] in all age categories and regions. The present study also has found that males develop axonal Guillain Barre Syndrome 3 times more because of their greater risk of exposure to *Campylobacter jejuni* infection. There is a strong relationship between *Campylobacter Jejuni* gastroenteritis and axonal GBS[15]. The male predominance in GBS is well-documented globally with a male-to-female ratio around 2:1[16]. This study confirms similar patterns with an overall male-to-female ratio of 2.4:1. Interestingly, axonal GBS had a much higher male predominance (~3:1) compared to demyelinating Guillain Barre Syndrome (~2:1). This may be attributed to higher male exposure to *Campylobacter jejuni*, particularly in Bangladesh, where cultural and occupational roles increase such exposure[15].

This study has revealed that the axonal subtype is common in urban area and demyelinating in rural area [34 (64.2%) vs 29 (52.7%)]. It has not been found any previous literature to compare this variable. However, overcrowding and water pollution in the urban area might lead to more Campylobacter jejuni gastroenteritis which is responsible for more axonal GBS cases in urban area[13]. This study observed that axonal GBS was more common in urban areas (64.2%), while demyelinating Guillain Barre Syndrome was more frequent in rural areas (52.7%). There is limited prior literature for direct comparison. However, plausible explanations include greater environmental contamination, overcrowding, and water pollution in urban regions, which may elevate the risk of Campylobacter jejuni infections, leading to axonal

Guillain Barre Syndrome. This insight offers a novel area for future research.

Seasonal influences on the occurrence of demyelinating and axonal type of GBS, demonstrates a clear relationship of axonal cases with the summer than demyelinating one (47.2% Vs. 27.3%). Similar relationship has also been described previously in an Indian study[16]. On the other hand, demyelinating cases are slightly higher in frequency than axonal cases in the spring (43.6% vs. 35.8%). However, Kalita et al[16] has described more demyelinating cases in rainy season. The study observed a higher frequency of axonal GBS in summer (47.2%), compared to demyelinating cases (27.3%). This aligns with the findings of Kalita et al[16] in India, who also reported a seasonal peak for axonal cases during warmer months. Conversely, this study reported more demyelinating cases in spring (43.6%) than axonal (35.8%), whereas Kalita et al[16] found higher demyelinating incidence in the rainy season. These regional discrepancies may be influenced by climatic differences, seasonal infection patterns, and geographic pathogen prevalence.

The nerve conduction study of the 108 cases of Guillain Barre Syndrome patients in this study revealed that 55(50.9%) cases were demyelinating and 53(49.1%) cases were of axonal variety. In the axonal group only 2 cases were AMSAN and the remaining 51 cases of AMAN variety. The distribution is nearly equal in both groups. Consistent with previous studies[12], this study confirms a broad heterogeneity in GBS subtypes across different regions. Globally, demyelinating GBS is more prevalent, especially in Europe and the Americas (55.0%), followed by Asia (45.0%) and Bangladesh (40.0%). Unlike Western countries where axonal GBS is relatively rare (3.0% to 17.0%), its prevalence in Asia and specifically Bangladesh is much higher-up to 67.0% as per Islam et al[10]. This study's nearly equal distribution of demyelinating and axonal types reflects this Asian pattern and is consistent with findings from Southeast Asia[17].

There are some limitations of the study. This study is based on a single centre; so, the results may vary with other institutional study. Although total sample size is quite large but individual group sample is small to affect the study results. Due to time constraint, it was not possible to collect sample throughout the year that may affect in the frequency of subtype of Guillain Barre Syndrome. Due to some logistic constraint LP and NCS were not possible to be done in due time which may interfere CSF and electrophysiological findings. Due to financial inability, it was not possible to provide immune-modulating therapy to all patients with clear indications that may influence the outcome. Only adult participants are taken as study sample; so, the study does not reflect the differences in demyelinating and axonal Guillain Barre Syndrome in overall population.

Conclusion

This study highlights both shared and divergent features of demyelinating and axonal GBS in Bangladesh. While several findings are consistent with global data-such as male predominance and seasonal variation-others, such as the near-equal distribution of subtypes, younger patient age, and urban predominance of axonal cases, reflect region-specific patterns. These differences emphasize the need for locally tailored diagnostic, therapeutic, and public health strategies in managing Guillain Barre Syndrome.

Acknowledgements
None

Conflict of interest
None

Financial Disclosure
This research project was not funded by any organization.

Contribution to authors
Islam MZ, Ara A, Yusuf MA: Concept of paper; Protocol preparation; data collection; data analysis; paper writing; Islam MZ, Yusuf MA: data collection; paper writing; Islam MZ, Yusuf MA: statistical analysis, paper writing; , Karim R, Hussain MR, Shaikh MMI: Manuscript revision; All authors read and approved the final version of the manuscript.

Data Availability
Any inquiries regarding supporting data availability of this study should be directed to the corresponding author and are available from the corresponding author on reasonable request.

Ethics Approval and Consent to Participate
Ethical approval for the study was obtained from the Institutional Review Board. As this was a prospective study the written informed consent was obtained from all study participants. All methods were performed in accordance with the relevant guidelines and regulations.

How to cite this article: Islam MZ, Ara A, Yusuf MA, Karim R, Hussain MR, Shaikh MMI. Sociodemographic Characteristics of Patients presented with Guillain Barre Syndrome: Experience at Referral Neuroscience Hospital in Bangladesh. J Natl Inst Neurosci Bangladesh, 2024;10(2):124-129

ORCID:
Md. Zakirul Islam: https://orcid.org/0009-0002-9772-7152
Anjuman Ara: https://orcid.org/0009-0001-7741-2105
Md. Abdullah Yusuf: https://orcid.org/0000-0002-8551-7185
Rezaul Karim: https://orcid.org/0009-0003-6091-6969
Mohammad Enayet Hussain: https://orchid.org/0000-0002-0379-1923
Md. Merazul Islam Shaikh: https://orchid.org/0009-0008-1274-1304

Article Info
Received on: 7 March 2024
Accepted on: 24 April 2024
Published on: 1 July 2024

References

1. Shrivastava M, Nehal S, Seema N. Guillain–Barre syndrome: Demographics, clinical profile & seasonal variation in a tertiary care centre of central India. Indian Journal of Medical Research. 2017 Feb 1;145(2):203-8.
2. Al Maawali SM, Al Shibani AY, Nadeem AS, Al-Salti AM. Guillain–Barre syndrome: demographics, clinical features, and outcome in a single tertiary care hospital, Oman. Neurosciences Journal. 2020 Oct 1;25(5):369-74.
3. Bragazzi NL, Kolahi AA, Nejadghaderi SA, Lochner P, Brigo F, Naldi A, Lanteri P, Garbarino S, Sullman MJ, Dai H, Wu J. Global, regional, and national burden of Guillain–Barré syndrome and its underlying causes from 1990 to 2019. Journal of neuroinflammation. 2021 Nov 11;18(1):264.
4. Rigo DD, Ross C, Hofstätter ML, Ferreira MF. Guillain Barré syndrome: epidemiological clinical profile and nursing care. Enfermería Global. 2020;19(1):376-89.
5. Peric S, Milosevic V, Berisavac I, Stojiljkovic O, Beslac-Bumbasirevic L, Marjanovic I, Djuric V, Djordjevic G, Rajic S, Cvijanovic M, Babic M. Clinical and epidemiological features of Guillain-Barré syndrome in the Western Balkans. Journal of the peripheral nervous system. 2014 Dec;19(4):317-21.
6. Wang X, Wang W, Wu X, Sun J, Xu S, Xie X, Xing F, Wang W, Cao S, Du J, Geng F. Global, Regional, and National Burden of Guillain-Barré Syndrome (1990-2021): Trend Analysis and COVID-19 Pandemic Effects.
7. Chen Z, Chen L, Chu F, Guan Q, Ma Y, Ji Q, Zhang H, Sun M, Ji J, Ren G, Huang T. Cross-country inequalities and trends in the global burden of COVID-19-induced Guillain-Barré syndrome, 2020 to 2021: a population-based study.
8. Ishaque T, Islam MB, Ara G, Endtz HP, Mohammad QD, Jacobs BC, Islam Z. High mortality from Guillain-Barré syndrome in Bangladesh. Journal of the Peripheral Nervous System. 2017 Jun;22(2):121-6.
9. Islam MB, Islam Z, Farzana KS, Sarker SK, Endtz HP, Mohammad QD, Jacobs BC. Guillain-Barré syndrome in Bangladesh: validation of Brighton criteria. Journal of the Peripheral Nervous System. 2016 Dec;21(4):345-51.
10. Islam Z, Jacobs BC, van Belkum A, Mohammad QD, Islam MB, Herbrink P, Diorditsa S, Luby SP, Talukder KA, Endtz HP. Axonal variant of Guillain-Barre syndrome associated with Campylobacter infection in Bangladesh. Neurology. 2010 Feb 16;74(7):581-7.
11. Islam Z, Jacobs BC, Islam MB, Mohammad QD, Diorditsa S, Endtz HP. High incidence of Guillain-Barre syndrome in children, Bangladesh. Emerging infectious diseases. 2011 Jul;17(7):1317.
12. Doets AY, Verboon C, Van Den Berg B, Harbo T, Cornblath DR, Willison HJ, Islam Z, Attarian S, Barroso FA, Bateman K, Benedetti L. Regional variation of Guillain-Barré syndrome. Brain. 2018 Oct 1;141(10):2866-77.
13. Sekiguchi Y, Uncini A, Yuki N, Misawa S, Notturno F, Nasu S, Kanai K, Noto YI, Fujimaki Y, Shibuya K, Ohmori S. Antiganglioside antibodies are associated with axonal Guillain–Barré syndrome: a Japanese–Italian collaborative study. Journal of Neurology, Neurosurgery & Psychiatry. 2012 Jan 1;83(1):23-8.
14. Kuwabara S, Yuki N. Axonal Guillain-Barré syndrome: concepts and controversies. The Lancet Neurology. 2013 Dec 1;12(12):1180-8.
15. Islam Z, Jacobs BC, van Belkum A, Mohammad QD, Islam MB, Herbrink P, Diorditsa S, Luby SP, Talukder KA, Endtz HP. Axonal variant of Guillain-Barre syndrome associated with Campylobacter infection in Bangladesh. Neurology. 2010 Feb 16;74(7):581-7.
16. Van den Berg B, Walgaard C, Drenthen J, Fokke C, Jacobs BC, Van Doorn PA. Guillain–Barré syndrome: pathogenesis, diagnosis, treatment and prognosis. Nature Reviews Neurology. 2014 Aug;10(8):469-82.
17. Kalita J, Kumar M, Misra UK. Prospective comparison of acute motor axonal neuropathy and acute inflammatory demyelinating polyradiculoneuropathy in 140 children with Guillain–Barré syndrome in India. Muscle & nerve. 2018 May;57(5):761-5.
18. Zaheer M, Naeem M, Nasrullah M. Seasonal variation and sex distribution inpatients with Guillain-Barre syndrome. Pakistan Journal of Neurological Sciences (PJNS). 2008;3(1):6-8.