DOI: https://doi.org/10.54393/pjhs.v7i1.3593

PAKISTAN JOURNAL OF HEALTH SCIENCES
(LAHORE)
https://thejas.com.pk/index.php/pjhs
ISSN (E): 2790-9352, (P): 2790-9344
Volume 7, Issue 01 (January 2026)

Original Article

OPEN ACCESS

Frequency of Urinary Retention in Guillain-Barré Syndrome Patients

Atta Rasool[1*], Wasim Wali Muhammad[1], Fawad Ahmad[1], Mahwish Mustafa[1], Fiza Wali[2] and Tahir Khan[1]

[1]Department of Neurology, Pak Emirates Military Hospital, Rawalpindi, Pakistan
[2]Ripha International University, Rawalpindi, Pakistan

ARTICLE INFO

Keywords:
Guillain-Barré Syndrome, Autonomic Dysfunction, Urinary Retention, Clinical Outcomes

How to Cite:
Rasool, A., Muhammad, W. W., Ahmad, F., Mustafa, M., Wali, F., & Khan, T. (2026). Frequency of Urinary Retention in Guillain-Barré Syndrome Patients: Urinary Retention in Guillain-Barré Syndrome Patients. Pakistan Journal of Health Sciences, 7(1), 126-130. https://doi.org/10.54393/pjhs.v7i1.3593

***Corresponding Author:**
Atta Rasool
Department of Neurology, Pak Emirates Military Hospital, Rawalpindi, Pakistan
attagillani53@gmail.com

Received Date: 7th November, 2025
Revised Date: 1st January, 2026
Acceptance Date: 9th January, 2026
Published Date: 31st January, 2026

ABSTRACT

The Guillain-Barré Syndrome (GBS) is an acute autoimmune polyneuropathy that can also have autonomic dysfunction, which leads to complications like urinary retention. These autonomic disorders should be identified early to reduce morbidity and avoid secondary complications, and improve patient outcomes. **Objective:** To determine the frequency of urinary retention among GBS patients. **Methods:** This retrospective cross-sectional study involves 129 patients diagnosed with GBS from 18 July 2025- 18 October 2025 at the Department of Neurology, Pak Emirates Military Hospital. Information on age, gender, body mass index, and disease severity was determined using the Hughes Functional Grading Scale. The presence of urinary retention was determined clinically. Chi-square test and logistic regression were applied to determine significant associations, considering $p<0.05$ as statistically significant. **Results:** A total of 129 patients were included with a mean age of 57.2 ± 17.3 years, predominantly females comprising 58.1%. The mean BMI was 30.2 ± 3.5 kg/m^2. Urinary retention was observed in 13 (10.4%) patients and is significantly more common among older patients (mean age 67.1 ± 8.9 years, $p=0.02$) and those with severe disease ($p=0.01$). No significant associations were found with gender ($p=0.34$), BMI ($p=0.21$), or area of residence ($p=0.42$). **Conclusions:** Urinary retention is a notable autonomic manifestation in GBS, particularly among older and severely affected patients. Early detection and management can help prevent urinary complications and reduce the duration of hospital stays.

INTRODUCTION

Guillain-Barré Syndrome (GBS) is an acute autoimmune polyneuropathy characterized by muscle weakness, areflexia, and sensory disorders that affect the patient's quality of life. The estimated prevalence of GBS was 1.1 to 1.8 per 100,000 persons [1]. The prevalence is 1.9 in high-income Asian Pacific regions and 0.8 in East Asia per 100,000 [2]. Among various variants of GBS, the most prevalent type was acute motor axonal neuropathy (AMAN) with a prevalence of 59%, followed by acute motor sensory axonal neuropathy (AMSAN) as 25.6% and 15.3% as acute inflammatory demyelinating polyradiculoneuropathy (AIDP) [3]. GBS can affect both the peripheral nervous system and the autonomic nervous system, resulting in a broad spectrum of complications, including life-threatening respiratory failure, cardiovascular instability, and bladder dysfunction, all of which require careful medical management [4]. About 40 to 45% of GBS patients developed Autonomic dysfunction, which leads to blood pressure (BP), tachycardia, and urinary retention. Urinary retention indicates a sever Autonomic involvement associated with longer hospital stays and higher mortality rates [5, 6]. Older patients and high disability scores are important risk factors. Research studies have documented varying frequencies of urinary retention among GBS patients, with reported rates fluctuating between 14% and 50%, influenced by factors such as the specific population studied and the diagnostic criteria applied [7]. This condition not only complicates the overall clinical course of the disease but also increases the risk of the development of secondary problems, such as UTIs, sepsis, and

DOI: https://doi.org/10.54393/pjhs.v7i1.3593

prolonged hospitalization, thus further burdening patients and healthcare systems [8]. According to another study, an additional 12 hours, 4 weeks after the onset of the symptoms, and approximately 25 percent of patients develop acute urinary symptoms like difficulty in voiding or acute urinary retention. The persistent overactive bladder and nocturia are long-term urinary symptoms. The most important urologic interventions are indwelling catheter in the acute phase, especially when the patient has respiratory failure, intermittent catheterization due to retention; the patient is still able to use his hands, voiding trial; and anticholinergics in case of persistence of overactive bladder after recovery [9].

Despite its clinical relevance, the exact frequency and pattern of urinary retention in patients with GBS remain underexplored in local populations, where demographic and disease variants may influence outcomes. The study helps to identify the burden of this complication in order to improve monitoring of patients, guide timely urological interventions, reduce duration of stay, and morbidity, thereby contributing to improved prognostic and rehabilitative outcomes in the care of GBS patients. This study aimed to identify the frequency of urinary retention among GBS patients and to emphasize its clinical implications for early recognition and management.

METHODS

This retrospective cross-sectional study was conducted at the Department of Neurology, Pak Emirates Military Hospital, from 18 July 2025- 18 October 2025, based on a sample of 129 GBS patients, calculated through WHO software by keeping an estimated prevalence of urinary retention among GBS patients as 9.2% [10], confidence level of 95%, and 5% margin of error. The data were collected from March 2024 to March 2025. The approval for the study was obtained from the Ethical Committee of Pak Emirates Military Hospital, Rawalpindi, under reference no: A/28/ERC/31/2025. Informed consent was obtained from patients or guardians. The inclusion criteria were patients of either gender, aged ≥18 years, diagnosed with GBS as per Brighton criteria, and having complete medical and personal records available. Patients with pre-existing bladder dysfunction or neurogenic bladder, a history of urinary tract obstruction or urological surgery, and with concurrent spinal cord injury or other neurological disorders affecting bladder function, or missing clinical information were excluded. GBS was diagnosed based on the Brighton criteria, which include progressive bilateral limb weakness, decreased or absent deep tendon reflexes, a monophasic illness pattern, and supportive cerebrospinal fluid and electrodiagnostic findings [11]. Severity of GBS was assessed using the Hughes Functional Grading Scale (HFGS), a validated functional disability scale for Guillain–Barré syndrome [12]. The HFGS grades functional status as: Grade 0 (healthy), Grade 1 (minor symptoms, able to run), Grade 2 (able to walk ≥10 m without assistance but unable to run), Grade 3 (able to walk ≥10 m with assistance), Grade 4 (bedridden or chair-bound), Grade 5 (requiring assisted ventilation), and Grade 6 (death). For analytical purposes, disease severity was categorized as mild (Grades 1–2), moderate (Grades 3–4), and severe (Grade 5). All grading was performed by a senior consultant neurologist during the hospital stay, minimizing inter-observer variability. Urinary Retention was defined as the inability to voluntarily void urine, requiring catheterization, with a post-void residual (PVR)volume of >300 mL confirmed by bladder ultrasound, performed using a Mindray DC-N3 ultrasound system with a 3.5–5 MHz convex transducer. PVR was measured within 10 minutes after an attempted voluntary voiding, with the patient in the supine position. All sonographic assessments were conducted by trained radiology technicians using the same ultrasound machine. Baseline demographic and clinical data, including age, gender, BMI, residence, medical history, neurological findings, and bladder status, were obtained retrospectively from hospital medical records, including admission notes, neurology progress notes, and investigation reports. Data extraction was carried out using a predesigned structured questionnaire to ensure uniformity and completeness of recorded variables. The data were analyzed through SPSS version 27.0. Categorical variables like gender, residence, GBS severity, and presence/absence of urinary retention were presented as frequencies and percentages, while continuous variables like age and BMI were presented as mean ± standard deviation (SD) or median (IQR), depending on data normality through Shapiro Wilk test. Age, gender, BMI, and GBS severity were stratified as presence/absence of urinary retention. Post-stratification Chi-square or Fisher's exact test was used, with the p-value of ≤0.05 considered significant.

RESULTS

This study includes 129 GBS patients. The mean age was 57.2 ± 17.3 years, predominantly female 75 (58.1%), and the mean BMI of patients was 29.71 ± 3.3 kg/m^2. In terms of residence, 78 (60.5%) were from urban areas. Regarding disease severity (based on the Hughes Functional Grading Scale, HFGS), 67 (51.9%) of patients had mild GBS, 35 (27.1%) had moderate, and 27 (20.9%) had severe disease. The overall frequency of urinary retention was 13 (10.4%) (Table 1).

DOI: https://doi.org/10.54393/pjhs.v7i1.3593

Table 1: Baseline Demographics and Clinical Characteristics

Variables	Mean ± SD, n (%)
Age	
Years	57.2 ± 17.3
Gender	
Female	75 (58.1%)
Male	54 (41.9%)
Residence	
Urban	78 (60.5%)
Rural	51 (39.5%)
GBS Severity (HFGS)	
Mild (Grade 1–2)	67 (51.9%)
Moderate (Grade 3–4)	35 (27.1%)
Severe (Grade 5)	27 (20.9%)
Others	
BMI (kg/m^2) - Mean ± SD	29.71 ± 3.3
Urinary retention	13 (10.4%)

Urinary retention was significantly associated with older age (p=0.008) and greater disease severity (p=0.024). No significant association was found with gender (p=0.16), BMI (p = 0.41), or residence (p=0.58) (Table 2).

Table 2: Urinary Retention versus Clinical Variables

Characteristics	Urinary Retention Present (n=13), Mean ± SD, n (%)	Urinary Retention Absent (n=116), Mean ± SD, n (%)	p-value
Age			
Years	68.4 ± 3.2	55.7 ± 6.5	0.008*
Gender			
Male	5 (7.0%)	70 (93.0%)	0.160
Female	8 (14.8%)	46 (85.2%)	
Residence			
Urban	8 (10.3%)	70 (89.7%)	0.580
Rural	5 (9.8%)	46 (90.2%)	
GBS Severity (HFGS)			
Mild (1–2)	1 (2.9%)	34 (97.1%)	0.024*
Moderate (3–4)	7 (10.4%)	60 (89.6%)	
Severe (5)	5 (22.2%)	22 (81.5%)	
Others			
BMI (kg/m^2)	27.5 ± 3.9	26.7 ± 4.1	0.410

Note: t-test used to compare the continuous variable. *p-value<0.05 was significant. Fisher's Exact test was used to compare categorical variables. *p-value<0.05 was significant.

Binary logistic regression showed that increasing age and greater GBS severity were significant independent predictors of urinary retention. Each one-year increase in age raised the odds of urinary retention by 5% (AOR = 1.05, p=0.015), while patients with severe GBS had nearly fivefold higher odds of developing urinary retention compared to those with mild disease (AOR = 4.89, p=0.035). However, gender and BMI were not significant predictors (Table 3).

Table 3: Binary Logistic Regression Analysis taking Urinary Retention as Dependent Variable

Variables	Coefficient	Adjusted OR (95% CI)	p-value
Age (Years)	0.049	1.05 (1.01 – 1.10)	0.015*
Gender (Female)	0.742	2.10 (0.72 – 6.11)	0.176
BMI (kg/m^2)	0.066	1.07 (0.91 – 1.26)	0.402
GBS Severity (Severe vs Mild)	1.588	4.89 (1.12 – 21.4)	0.035*
Constant	-6.215	–	0.002*

*p-value<0.05 was significant.

DISCUSSION

This study demonstrated urinary retention in 10.4% of GBS patients, making it an important manifestation of autonomic dysfunction. This frequency, though lower than the 14–50% range reported in the literature, is of clinical significance. Pagaling *et al.* [6] reported dysautonomia, including urinary retention, in 49% of GBS cases in the Philippines [6], while Ogawa *et al.* linked urinary retention with hyponatremia and poorer clinical outcomes [8]. Combined with other findings, they indicate that bladder impairment is indeed an important constituent of autonomic disturbance in GBS, a factor that explains a longer hospitalization and a higher degree of morbidity [8]. The lower rate of urinary retention in our study may have been due to the differences in population and definition of urinary retention in different studies, as well as the distribution of GBS subtype, which was not measured in our cohort. Also, being a retrospective study, there is always a possibility of some under-detection, as not all patients may have recorded their bladder symptoms or their PVR regularly. Autonomic dysfunction develops in GBS patients in 40–45% of the cases [5] because of the demyelination or axonal injury of the autonomic fibers controlling cardiovascular and urinary functions [13, 14]. In our study, older age was independently related to urinary retention, in line with the study of Chen *et al.* who demonstrated that the higher age-related decline in autonomic function increases the risk of dysautonomia [15]. Elderly patients might have weak compensatory responses, and this is perhaps the explanation for their increased susceptibility to urinary retention. Disease severity had a strong correlation with urinary retention, where the odds for patients with severe GBS were approximately fivefold compared to those with mild disease. Our finding is in line with previous studies that have associated higher disability scores in GBS with greater autonomic involvement [6, 8]. Severe forms likely reflect more extensive neural damage implicating both motor and autonomic pathways. While gender, BMI, and residence showed no significant association, female predominance in some reports [16] suggests that hormonal or physiological differences may occasionally contribute, but these factors are seemingly

DOI: https://doi.org/10.54393/pjhs.v7i1.3593

secondary to disease severity. Urinary retention in GBS is a clinical issue that needs to be spotted in time to prevent the complications of urinary tract infections and sepsis. Constant bladder observation and prompt catheterization of the bladder is essential preventative measures [17, 18]. Moreover, its correlation with hyponatremia also predetermines the importance of keeping track of electrolyte imbalance and other indicators of autonomic instability of the state, which is described by Ogawa et al. [8]. Autonomic recovery can be enhanced by early administration of supportive therapies such as intravenous immunoglobulin or plasmapheresis [19-21].

The retrospective and cross-sectional study design with a single center design is the only one that restricts generalizability because of the moderately sized sample. The subtypes of the electrophysiological type were not examined. The future research should include subtype correlation and follow-up on long-term persistence of bladder dysfunction after the recovery. These results highlight the importance of close autonomic surveillance of patients at risk to enhance the prognosis and decrease the number of complications in the hospitalization environment.

CONCLUSIONS

Urinary retention represented one of the important presentations of autonomic dysfunction. Increasing age and high disease severity were found to be independently significantly related to urinary retention, while gender, BMI, and residence were not significantly related to the condition. These findings stress the need for early recognition and continued bladder monitoring during hospitalization with GBS, especially in elderly patients and those with severe neurological impairment.

Authors Contribution

Conceptualization: AR
Methodology: AR, WWM
Formal Analysis: FW
Writing and Drafting: WWM FA, MM, TK
Review and Editing: AR, WWM, FA, MM, FW, TK

All authors approved the final manuscript and take responsibility for the integrity of the work.

Conflicts of Interest

All the authors declare no conflict of interest.

Source of Funding

The author received no financial support for the research, authorship and/or publication of this article.

REFERENCES

[1] Nguyen TP, Taylor RS, Renwanz Boyle AG. Guillain-Barré Syndrome (Nursing). StatPearls Publishing, Treasure Island (FL). 2023 Feb. https://europepmc.org/article/nbk/nbk532254.

[2] Bragazzi NL, Kolahi AA, Nejadghaderi SA, Lochner P, Brigo F, Naldi A *et al.* Global, Regional, and National Burden of Guillain–Barré Syndrome and Its Underlying Causes from 1990 to 2019. Journal of Neuroinflammation. 2021 Nov; 18(1): 264. doi: 10.1186/s12974-021-02319-4.

[3] Ul Haq MA, Nabi D, Khan MO, Ullah R, Junaid M, Nasarullah HM. Frequency, Age, Gender Distribution, and Seasonal Variation of Guillain-Barré Syndrome in a Province of Pakistan: A Retrospective Study: Prevalence of Guillain-Barré Syndrome. Pakistan Journal of Health Sciences. 2023 Mar: 207-10. doi: 10.54393/pjhs.v4i03.565.

[4] Doets AY, Lingsma HF, Walgaard C, Islam B, Papri N, Davidson A *et al.* Predicting Outcome in Guillain-Barré Syndrome: International Validation of the Modified Erasmus GBS Outcome Score. Neurology. 2022 Feb; 98(5): e518-32.

[5] Tung KM, Bachi BA, Chia YL, Haw CY. From Paralytic Ileus to Guillain-Barré Syndrome: A Diagnostic Puzzle. Borneo Journal of Medical Sciences. 2025 May; 19(2): 140-4. doi: 10.51200/bjms.v19i2.5486.

[6] Pagaling GT, Dichoso LP, Reyes NG, Prado Jr MB. Association of Dysautonomia and Different Risk Factors in Patients with Guillain-Barré Syndrome in a Tertiary Hospital in the Philippines. BioMed Central Neurology. 2025 Jan; 25(1): 29. doi: 10.1186/s12883-025-04029-3.

[7] Welk B, Sakakibara R, Sinha S, Haslam C, Vrijens D, Gomes C *et al.* Lower Urinary Tract Dysfunction in Uncommon Neurological Diseases: A Report of the Neurourology Promotion Committee of the International Continence Society. Continence. 2022 Mar; 1: 100022. doi: 10.1016/j.cont.2022.100022.

[8] Ogawa S, Hosokawa T, Hayakawa C, Sawai T, Kakiuchi K, Nishioka D *et al.* Risk Factors and Outcome of Hyponatremia in Patients with Guillain–Barré Syndrome. Scientific Reports. 2024 Jul; 14(1): 16664. doi: 10.1038/s41598-024-67427-6.

[9] Dray EV. The Urologic Impact of Guillain–Barré Syndrome. InUrological Care for Patients with Progressive Neurological Conditions. Cham: Springer International Publishing. 2019 Sep: 143-150. doi: 10.1007/978-3-030-23277-1_16.

[10] Sakakibara R, Uchiyama T, Kuwabara S, Mori M, Ito T, Yamamoto T *et al.* Prevalence and Mechanism of Bladder Dysfunction in Guillain–Barré syndrome.

DOI: https://doi.org/10.54393/pjhs.v7i1.3593

Neurourology and Urodynamics: Official Journal of the International Continence Society. 2009 Jun; 28(5): 432-7. doi: 10.1002/nau.20663.

[11] Sejvar JJ, Kohl KS, Gidudu J, Amato A, Bakshi N, Baxter R *et al.* Guillain–Barré syndrome and Fisher Syndrome: Case Definitionsand Guidelines for Collection, Analysis, and Presentation of Immunization Safety Data. Vaccine. 2011 Jan; 29(3): 599-612. doi: 10.1016/j.vaccine.2010.06.003.

[12] Hughes RA, Swan AV, Raphaël JC, Annane D, van Koningsveld R, van Doorn PA. Immunotherapy for Guillain-Barré Syndrome: A Systematic Review. Brain. 2007 Sep; 130(9): 2245-57. doi: 10.1093/brain/awm004.

[13] Mahajan R, Kalita J, Jha V, Gutti NB, Pandey PC, Misra UK. Temporal Pattern of Individual Neurological Function Recovery in Guillain–Barré Syndrome. Journal of Clinical Medicine. 2024 Sep; 13(18): 5635. doi: 10.3390/jcm13185635.

[14] Singh J, Raja Sr V, Irfan M, Hashmat O, Syed M, Shahbaz NN. Frequency of Autonomic Dysfunction in Patients of Guillain-Barré Syndrome in A Tertiary Care Hospital. Cureus. 2020 Dec; 12(12). doi: 10.7759/cureus.12101.

[15] Chen X, Ko W, Waseem F, Cilcic L, Kazi N, Abdelhafiz A. Guillain–Barré Syndrome in Older People—A Case Report and Literature Review. Diseases. 2025 Sep; 13(9): 306. doi: 10.3390/diseases13090306.

[16] Ahmed W, Nizam MZ, Rafi S, Khawaja A, Rafi Sr S. An Uncommon Presentation of Guillain-Barré Syndrome in a Young Postpartum Woman. Cureus. 2025 Sep; 17(9): e93081. doi: 10.7759/cureus.93081.

[17] Khoo CS, Ali AH, Remli R, Tan HJ. A Case of Guillain-Barré Syndrome (GBS) Presenting with Acute Urinary Retention and T6 Sensory Level. Clinical Medicine. 2018 Aug; 18(4): 308-10. doi: 10.7861/clinmedicine.18-4-308.

[18] Chrouser K, Fowler KE, Mann JD, Quinn M, Ameling J, Hendren S *et al.* Urinary Retention Evaluation and Catheterization Algorithm for Adult Inpatients. Journal of the American Medical Association Network Open. 2024 Jul; 7(7): e2422281-. doi: 10.1001/jamanetworkopen.2024.22281.

[19] Tewedaj ZD, Huluka DK, Kebede YT, Abebe AT, Hussen MS, Mohammed BD *et al.* A Retrospective Analysis of the Clinical Profile and Factors Associated with Mortality and Poor Hospital Outcomes in Adult Guillain–Barré Syndrome Patients. Scientific Reports. 2024 Jul; 14(1): 15520. doi: 10.1038/s41598-024-65265-0.

[20] Mohebrad N, Zemorshidi F, Boostani R, Saeidi M, Amerizadeh F. Examination of the Demographic Characteristics, Clinical Manifestations, and Outcome of Guillain-Barre Syndrome Patients in the East of Iran. Shiraz E-Medical Journal. 2025; 26(26): e164146. doi: 10.5812/semj-153476.

[21] Leonhard SE, Mandarakas MR, Gondim FA, Bateman K, Ferreira ML, Cornblath DR *et al.* Diagnosis and Management of Guillain–Barré Syndrome in Ten Steps. Nature Reviews Neurology. 2019 Nov; 15(11): 671-83. doi: 10.1038/s41582-019-0250-9.