STUDY OF EPIDEMIOLOGY, CLINICAL PRESENTATION, SEVERITY, VARIANTS OF GUILLAIN-BARRÉ SYNDROME IN A TERTIARY CARE HOSPITAL

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Abstract : GBS is an autoimmune, acute, frequently severe, polyradiculoneuropathy. It may present as rapidly developing ascending motor paralysis with associated autonomic dysfunction and/or cranial nerve palsies. Aim is to study clinical profile of GBS and its variants, common subtype and severity of Subtypes, correlations between clinico-epidemiological profile and subtypes.This is a descriptive cross sectional ,retrospective study done in the Department of Neurology involving 21 cases of GBS based on Clinical brighton citeria and
results were 14 were males and 7 were females,25-40 years had the highest incidence, most common antecedent events are fever and vomiting. Majority of patients were found to be alcoholic ,not smokers. Most common variant in our study is AMSAN variant. AIDP variant had the highest mean mEGOS at the time of admission, longest duration of stay in hospital and cranial nerve impairment ,AMAN variant had the shortest stay most common GBS variant in older patients in this study is AIDP.
Key words: GBS,AMAN.AMSAN, m EGOS, AIDP, Brighton criteria

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INTRODUCTION

GBS is an autoimmune, acute, frequently severe, polyradiculoneuropathy. It may present as rapidly developing ascending motor paralysis with associated autonomic dysfunction and/or cranial nerve palsies. It is the leading cause of acute neuromuscular weakness in the developed world[(1)]. The clinical diagnosis of GBS is typically done through CSF Albuminocytologic dissociation and electrodiagnostic studies such as EMG showing typical abnormalities[(2)]. There are majorly four Subtypes[(3)]/variants recognised, namely 1. Acute inflammatory demyelinating polyneuropathy (AIDP), 2. Acute motor axonal neuropathy (AMAN), 3.Acute motor and sensory axonal neuropathy, 4. Miller fisher syndrome (MFS) with each having minor, subtle differences although often similar features. All variants have characteristic defining features but do not always hold true in all cases. All variants can have overlying shared features. Assessment of the GBS variant should be done beforehand as to align the management accordingly, failure of which may affect the outcome/prognosis negatively.

Data about the clinicoepidemiological profile and outcome of patients in Kakinada and also Andhra Pradesh and India are limited. With limited resources in a developing country such as ours, identifying patients with GBS and knowing the factors associated with worse prognosis can help in better utilisation of our limited resources. This study is to be done to fulfil this need and to improve management of our patients with GBS.

The Brighton criteria[(4)] is used to classify the certainty and diagnosis of GBS. The severity of the disease was assessed during the admission using the Medical Research Council Sum Score(MRCSs) and during the treatment by MRCSs, Hughes motor scale and also

autonomic dysfunction and respiratory problems.

The correlation between the GBS variant severity and factors associated with the patients like age, personal history, antecedental events along with vaccination history if any, comorbidities, family history are explored using retrospective clinical study methods.

The certainty of diagnosis based on Brighton criteria, Clinicoepidemiological profile including sex, symptoms and sequence of them, antecedent events/triggering events, severity of involvement are explored using retrospective clinical study methods and also descriptive cross sectional studies.

IMPLICATIONS:

1. The information obtained from this study allows a better understanding of the etio-pathology of GBS and its subtypes.
2. Correlations made between the GBS variant and its associated characteristics like clinical presentations, clinicoepidemiology, personal history, antecedent events can be used to aid in the early initial diagnosis and starting of empiric treatment.
3. The data can be used to structure the management to improve morbidity and mortality.
4. Correlation obtained from modified Erasmus GBS Outcome score (mEGOS)[(5)]and MRCsum scores[(6)] with severity help in assessing the prognosis of the patient.
5. Using the results of this study, an initiative for establishing improved hospital GBS management policy and guidelines should be taken.

AIMS AND OBJECTIVES :

1. To study the clinical profile of GBS and its variants.
2. To identify clinical presentations and to determine severity of Subtypes of GBS.
3. To determine the most common subtype of GBS.
4. To identify and establish correlations between clinico-epidemiological profile and subtypes.

PATIENTS AND METHODS:

This descriptive cross sectional study and retrospective study was done in the department of neurology, in a tertiary care government general hospital Kakinada, Andhra Pradesh during September 2023 to November 2023.

INCLUSION CRITERIA:

1. All patients of age 14 years and above, diagnosed with Guillain-Barré syndrome(GBS) from September 2023 onwards were included in this study.
2. Both males and females are included in the study.

EXCLUSION CRITERIA:

1. Patients with similar presentation as GBS but with different and uncertain diagnosis(mimics of GBS) including those with previous trauma leading to paresis, history of neuromuscular weakness, poliomyelitis, myasthenia gravis, periodic paralysis, transverse myelitis etc were excluded from this study.
2. Patients who are visiting the hospital more than once over the study period.

SAMPLE COLLECTION:

All clinically diagnosed cases of Guillain barré syndrome(GBS) using Brighton diagnostic criteria presented in the hospital in the study period were studied. After controlling the inclusion and exclusion criteria, patients are approached and surveyed according to the questionnaire(mentioned in the appendix) with consent. Patients are also examined physically as per required. Handwritten case records(case sheets) were checked and used appropriately. The following data were then collected : patient demographic details, clinical profile and history, initial physical and neurological examination as in the questionnaire.

Sample size is 21 subjects.

The appropriate data collected is then analysed. Few of the patients' data were incomplete but used appropriately by

excluding wherever incomplete and including wherever possible for the study.

People in this study were patients that were willing to participate. All the patients' information was confidential. Research plans were ratified by the institutional ethics committee and Institutional ethics certificate was obtained before the study. Individual patient consent is obtained before the study.

The criteria used in biostatistical analysis of the study were defined with mean, standard deviation and percentage ratios.

ophthalmoplegia, ataxia and areflexia[7].`

TABLE 1. GBS variants

GBS subtypes	Main clinical features	NCS findings	Antibodies*
AIDP	Sensorimotor GBS, often combined with cranial nerve deficits and frequent autonomic dysfunction	Demyelinating polyneuropathy	Various‡
AMAN	Pure motor GBS; cranial nerves rarely affected	Axonal polyneuropathy, sensory action potential normal	GM1a, GM1b GD1a GalNAc-GD1a
AMSAN	Resembles severe AMAN, but sensory fibres are affected, leading to sensory deficits	Axonal polyneuropathy, sensory action potential reduced or absent	GM1,
PCB variant	Prominent weakness of oropharyngeal, facial, neck and shoulder muscles	Normal in most, sometimes abnormalities in arms, mostly axonal pattern	GT1a>GQ 1b>>GD1 a
MFS	Ataxia, ophthalmoplegia, areflexia	Normal in most; discrete changes in sensory conduction or H-reflex may be present	GQ1b, GT1a

*Antibodies are predominantly IgG, but IgM and IgA antibodies have also been demonstrated.‡Association with GBS and role in its pathogenesis unknown.Abbreviations: GBS, Guillain–Barré syndrome; NCS, nerve conduction study; PCB, pharyngeal-cervical brachial variant
Source:https://www.nature.com/articles/nrneurol.2014.121/tables/1 [8]

TABLE 2. Brighton diagnostic criteria levels

Diagnostic Criteria	Level of Diagnostic Criteria			
Symptoms	1	2	3	4
Bilateral and flaccid weakness of limbs	+	+	+	+/-
Decreased or absent deep tendon reflexes in weak limbs	+	+	+	+/-
Monophasic course and time between onset-nadir 12h to 28 days	+	+	+	+/-
CSF cell count <50/ul	+	+/-[a]	-	+/-
CSF protein concentration > normal value	+	+/-[a]	-	+/-
NCS findings consistent with one of the subtypes of GBS	+	+/-[a]	-	+/-
Absence of alternative diagnosis for weakness	+	+	+	+

+present; - absent, +/- present or absent, NCS = nerve conduction studies, [a]If CSF was not collected or results not available, nerve electrophysiology results must be consistent with the diagnosis of GBS, CSF findings of GBS may also be referred to as Albumino-cytologic dissociation.

FIGURE 3. mEGOS

Prognostic factor	Score at hospital admission	Score at week 1
Age at onset (year)		
≤40	0	0
41–60	1	1
>60	2	2
Preceding diarrhea		
Absent	0	0
Present	1	1
MRC sumscore		
51–60	0	0
41–50	2	3
31–40	4	6
00–30	6	9
mEGOS	0–9	0–12

OBSERVATIONS AND ANALYSIS :

The present study was done on 21 GBS patients for a period of 3 months (September 2023 to November 2023) involving both sexes and patients ageing 14 years and above.

1.ClinicoEpidemiological :

1.1 Age variation :

In this study, the mean age of the participants is 39.38±17.92. The maximum age is 83, the minimum age is 14 in this study, median age is 35.

TABLE 3. Age and sex distribution of patients with GBS

Sl. No.	Age groups in years	Male		Female		Total	
		No.	%	No.	%	No.	%
1	14-25	3	14.3	2	9.6	5	23.8
2	25-40	5	23.8	1	4.8	6	28.6
3	40-55	2	9.6	3	14.2	5	23.8
4	55-70	4	19	0	0	4	19.0
5	70-85	0	0	1	4.8	1	4.8
Total		14	66.7	7	33.3	21	100

1.2 Sex variation :

In this study of 21 patients, 66.7% (14) were males and 33.3% (7) were females.

1.3 Personal history :

In this study 52.6%(10 out of 19) patients were alcohol consumers

TABLE 4. GBS in relation to Alcohol consumption

Variable	Value	Percentage
Alcoholic	10	52.6%
Non Alcoholic	9	47.4%
Total	19	100

Only 10.5%(2 out of 19) patients in this study were smokers.

TABLE 5. GBS in relation to smoking

Smoker	2	10.5%
Non Smoker	17	89.5%
Total	19	100

2. Days between onset of GBS symptoms and admission in hospital :

The mean number of days between the onset of GBS symptoms and admission of patients is 9.76±7.82. The maximum is 25 days and the minimum is 2 days.

TABLE 6. Age group and Days between onset of symptoms and admission

Age Group	Value	Duration between onset of symptoms and admission mean±SD
14-25	5	4.6±1.52
25-40	6	11.83±9.72

40-55	5	12.2±10.01
55-70	4	11.5±5.97
70-85	1	4

3. Duration of stay in hospital :

Mean duration of stay in hospital is 10.85±5.41, maximum is 21 days and minimum is 4 days for the duration of stay in hospital.

TABLE 7. Age group and duration of stay in hospital

Age Group (Years)	Mean of duration of stay in hospital
14-25	10.25±7.27
25-40	11.5±3.5
40-55	10.8±5.9
55-70	10±5.8

4. Antecedent event/triggering events :

Out of 20 individuals, 70% (14) individuals did not reported any antecedent event and 30% (6) individuals reported an antecedent event.

Majority (70%) of the individuals did not report any antecedent event. 15%(3) reported fever out of which 10%(2) reported fever with cough, 10% (2) reported vomitings 5%(1) reported diarrhoea with vomiting as antecedent events.

TABLE 8. Antecedent events

Clinicoepidemiological study of GBS (N=20)		
Variables	Value	Percentage
Fever	1	5%
Fever and cough	2	10%
Vomiting	2	10%
Diarrhoea and vomiting	1	5%
No Antecedent event	14	70%
Total	20	100

5. Comorbidities:

Majority 73% (16) of the individuals did not have any pre-existing comorbid conditions. Comorbidities in this population of study include: 4.8 %(1) patients had diabetes, 4.8 % patients had hypertension, 4.8 % patients had hypertension with polycystic kidney disease, 4.8 % patients had HIV infection with hypertension, 4.8% had hypothyroidism, 4.8% had inflammatory bowel disease.

TABLE 9. Comorbidities

Comorbidity	Value	Percentage
Diabetes	1	4.8%
Hypertension	1	4.8%
Hypertension with Polycystic kidney disease and Epilepsy	1	4.8%
HIV with hypertension	1	4.8%
Hypothyroidism	1	4.8%
Inflammatory Bowel disease	1	4.8%
No comorbidities	15	71.2%
Total	21	100

6. Modified Erasmus GBS outcome score (mEGOS) at admission :

The Mean value of mEGOS for 20 individuals is 2.85±2.06, maximum is 7 and minimum is 0. The representation below shows the values of mEGOS for different ages.

TABLE 10. Age group and mEGOS

Age Groups in Years	Number of individuals in the corresponding age group (Total=20)	mEGOS Mean±Standard deviation
14-25	5	2.8±1.78
25-40	5	1±1.00
40-55	5	3±1.22
55-70	4	4.75±2.63
70-85	1	4±0

7. Symptoms of GBS:

Presenting symptoms in GBS of patients in this study are : ascending paralysis in 100% patients, cranial nerve impairment in 25%, sensory impairment like paraesthesias (tingling/pins and needles sensation) in 75% of the patients, dysphagia in 5%, autonomic dysfunction in 10%(5%(1) with profuse sweating with hypertension and tachycardia and 5% with hypotension and tachycardia), respiratory failure requiring mechanical ventilation in 10% of the patients.

TABLE 11. Symptoms of GBS

Variables	Value	Percentage
Ascending Paralysis	20	100%
Cranial nerve involvement	5	25%
Sensory involvement	15	75%
Dysphagia	1	5%
Autonomic dysfunction	2	10%
Respiratory Failure	2	10%

8. Cranial nerves involved :

5(25%) patients out 20 have cranial nerve impairment,of which Most common cranial nerve to be involved is the 7th cranial nerve in 20% (4) of individuals, 3rd cranial impairment in 5%, lower cranial nerve impairment (bulbar weakness) in 5% of the patients.

TABLE 12. Involvement of Cranial nerves

Cranial nerve/nerves involved	Value	Percentage
7th cranial nerve alone	3	15%
7th and 3rd cranial nerves	1	5%
Lower cranial nerves (Bulbar)	1	5%
No cranial nerve involved	15	75%
Total	20	100

9. Motor involvement:

All 100% (20) of the individuals have motor deficits, out of which 55%(11) individuals had paraparesis and 45%(9) individuals had quadriparesis type of deficits.

TABLE 13. Type of Motor deficit

Type	Number	Percentage
Paraparesis	11	55%
Quadriparesis	9	45%
Total	20	100

10. Neck movement weakness :

Out of 18 individuals, only 5.55%(1 individual) had neck movement weakness.

11. Difficulty in standing and walking:

TABLE 14. Difficulty in walking

Difficulty in standing and walking	Value (Total=19)	Percentage
Present	5	26.3%
Absent	14	73.7%

12. A) REFLEX RESPONSES:
9 (50%) out of 18 patients had at least some deficit in reflexes of which 16.7% had only lower limb areflexia, 33.3% had total body areflexia. Very Brisk response/Hyperreflexia (Grade 3+) was seen in 11.1%(2 out of 18) patients.

TABLE 15. A)Reflexes

Type	Value	Percentage
Lower limb Areflexia	3	16.7%
Total Areflexia	6	33.3%
No Areflexia (Reflexes present)	9	50%
Total	18	100

12. B) Deep tendon reflexes (DTRs) :
66.7%(12 out of 18) patients had at least some reflexes preserved at the time of admission and 33.3% had complete (total body) areflexia.

TABLE 16. B)Reflexes

DTRs	Value(Total=18)	Percentage
Present	12	66.7%
Completely Absent(Areflexia)	6	33.3%

13. Nerve conduction study findings(NCS) :
As shown below the most common finding in this study is the Acute motor sensory axonal neuropathy(AMSAN) variant seen in 41.2%(7 out of 17) patients.

TABLE 17. GBS variants

NCS findings/ Variant/Subtype	Value	Percentage
AMSAN (Acute motor sensory axonal neuropathy)	7	41.2%
AMAN (Acute motor axonal neuropathy)	4	23.5%
AIDP (Acute inflammatory demyelinating polyneuropathy)	6	35.3%
MFS (Miller fisher syndrome)	0	0%
Total	17	100

14. GBS VARIANTS SEX VARIATION:

Below table 18 shows the GBS variants sex variations.

TABLE 18. GBS variants and Sex variation

Variant	Male		Female		Total	
	No.	%	No.	%	No.	%
AMSAN	6	35.3%	1	5.89%	7	41.17%
AMAN	3	17.65%	1	5.89%	4	23.52%
AIDP	4	23.52%	2	11.8%	6	35.3%
Total	13	76%	4	24%	17	100%

15. VARIANTS AND MEAN AGE, MEGOS AND DURATION OF STAY:

Below table 19 shows the observations for each GBS variant.

TABLE 19. GBS variants, Age, mEGOS and duration of stay comparison

Variant	Value	Mean Age	mEGOS	Duration of Stay
AMSAN	7	29.28±12.75	2.57±1.61	12±5.95
AMAN	4	36.25±13.74	1.75±2.06	10±3.46
AIDP	6	48.17±15.8	3.5±2.89	13.67±3.44

RESULTS :

A study on Guillain barre syndrome disease profile was conducted over a period of 3 months September 2023 to November 2023.

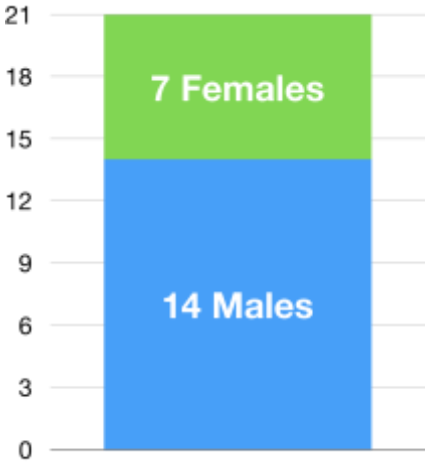
A total of 21 cases of GBS were studied during the period of 3 months.

A. SEX DISTRIBUTION:

As seen in the table

Out of 21 individuals diagnosed with GBS, 67%(14) were males and 33%(7) were females with male to female ratio of 2:1 which shows that Males were more affected than females.

CHART 5. Sex distribution of GBS

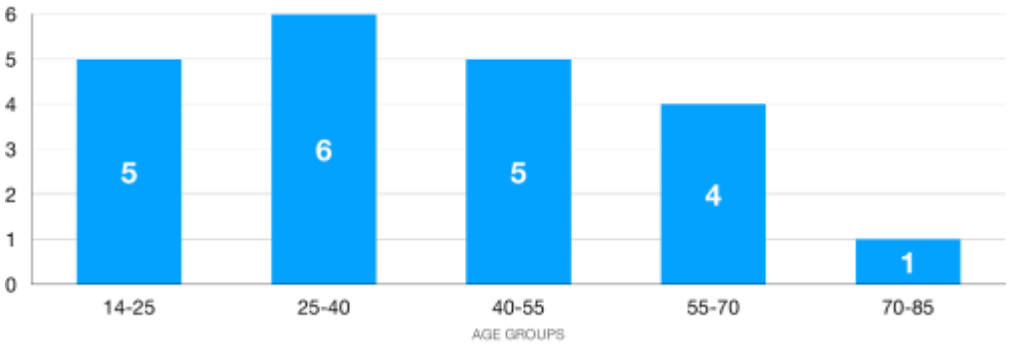


B. AGE DISTRIBUTION OF GBS :

Age wise distribution of GBS as shown in table 1, revealed that out of 21 diagnosed cases, 5 were from age group 14-25 years, 6 were from age group 25-40 years, 5 were from age group 40-55 years, 4 were from age group 55-70 years, 1 was from age group 70-85 years.

GBS was more in the 25-40 age group accounting for 28.6%(6 out of 21) of the cases.

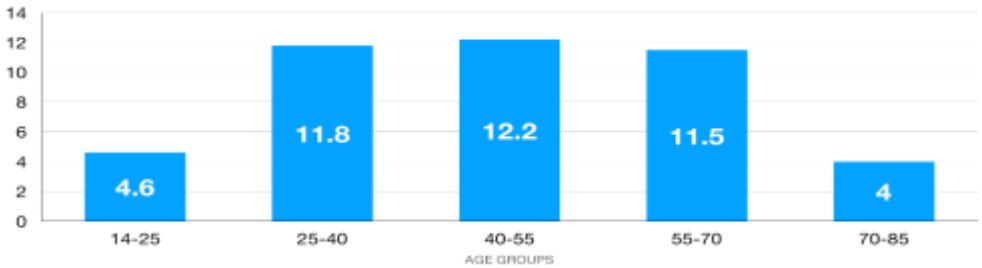
CHART 6. Age group distribution of GBS



C. CORRELATION BETWEEN AGE GROUP AND DURATION BETWEEN ONSET OF SYMPTOMS AND ADMISSION(MEAN):

The mean values of duration between onset of GBS symptoms and admission in different age groups are : 4.6±1.52 days for 14-25 years age group, 11.83±9.72 days for 25-40 years age group, 12.2±10.01 days for 40-55 years age group, 11.5±5.97 days for 55-70 age group. Patients of age group 14-25 years presented earlier in 4.6 days and patients of age group 40-55 years presented relatively late to the hospital after onset of symptoms.

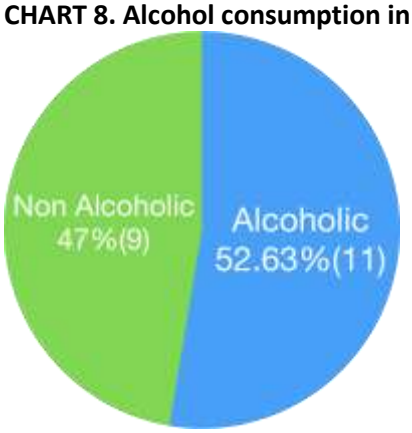
CHART 7. Age group and duration between onset of symptoms and admission variation



D. CORRELATION BETWEEN GBS AND ALCOHOL CONSUMPTION:

Majority 52.63%(11 of 20) patients were alcohol consumers.

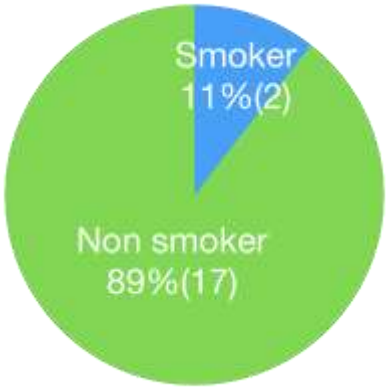
CHART 8. Alcohol consumption in GBS patients



E. CORRELATION BETWEEN GBS AND SMOKING :

Majority 89%(17 out of 19) of the patients were non-smokers.

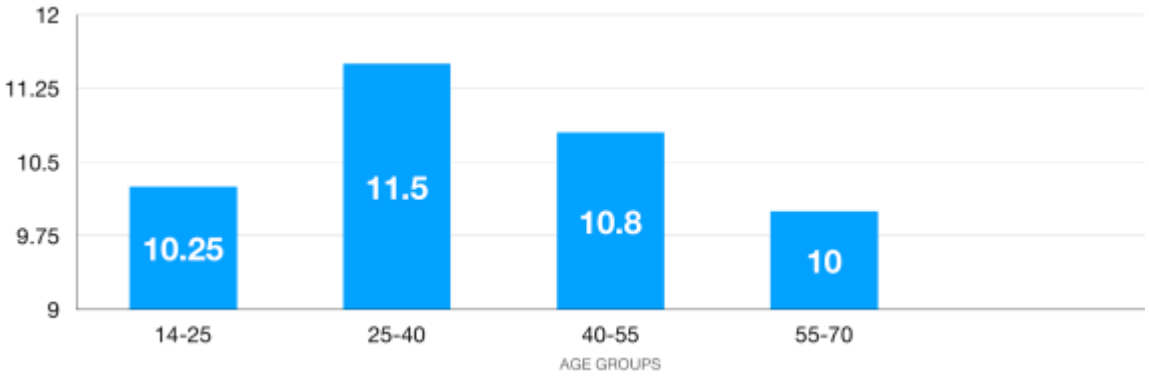
CHART 9. Smoking in GBS patients



F. CORRELATION BETWEEN AGE GROUPS AND DURATION OF STAY IN HOSPITAL(MEAN):

Patients of age group 25-40 years had the longest duration of stay compared to other age groups with 11.5±3.5 days. Patients of age group 55-70 years had the shortest duration of stay relatively with 10±5.8 days.

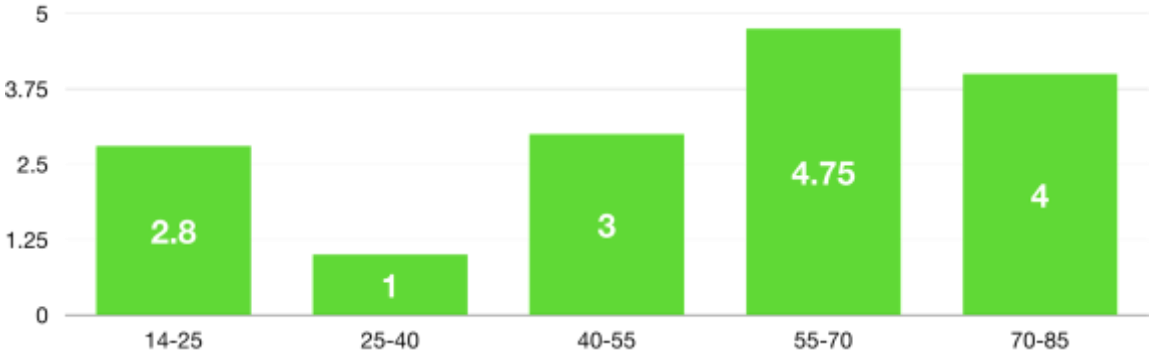
CHART 10. Age group and duration of stay variation



G. CORRELATION BETWEEN AGE GROUPS AND MEGOS(mean):

Age group 55-70 years had the highest mEGOS with a mean of 4.75±2.63, age group 25-40 years had the lowest mEGOS with a mean of 1±1.00.

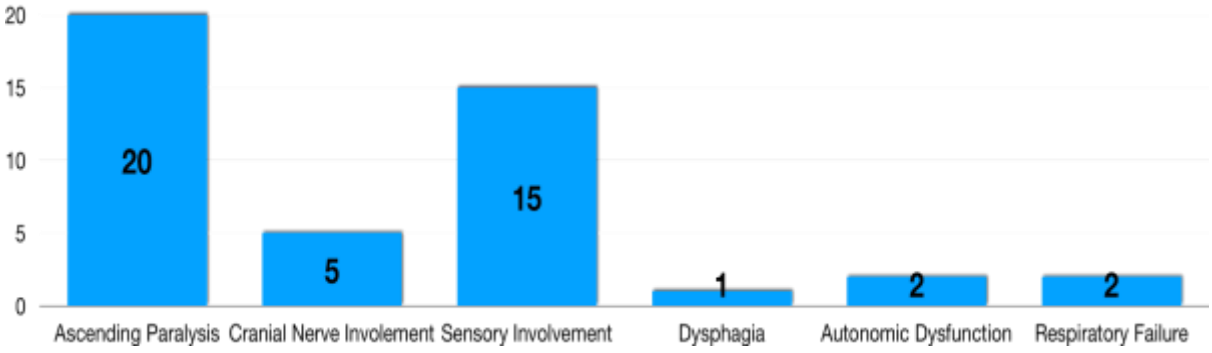
CHART 11. Age group and mEGOS variation



H. ANALYSIS OF GBS SYMPTOMS :

Every patient in this study presented with ascending paralysis at the time of admission. 2nd most common symptom associated with GBS is sensory impairment seen in 75%(15 of 20) patients, other symptoms associated with GBS seen this study in decreasing order of occurrence: cranial nerve impairment seen in 25%(5) patients, autonomic dysfunction seen in 10%(2 out of 20) patients, respiratory failure seen in 10% patients and dysphagia seen in 5%(1) patient.

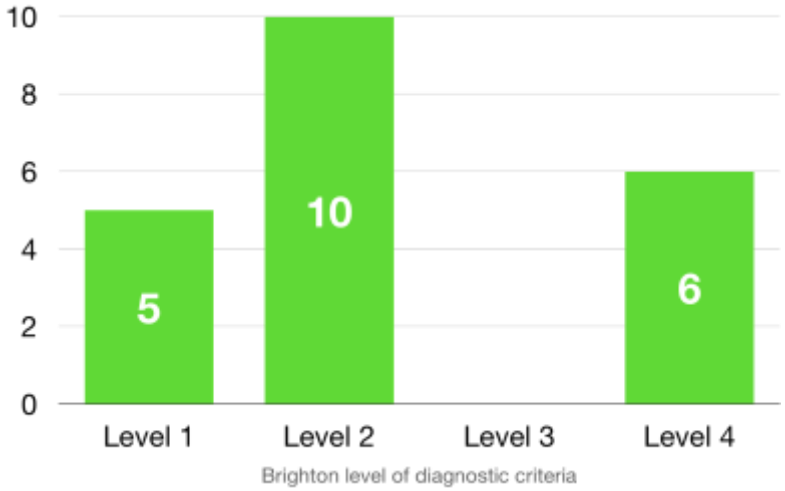
CHART 12. GBS symptoms



I. CERTAINTY OF DIAGNOSIS:

The certainty of diagnosis of GBS was based on the Brighton criteria. Which is mentioned in the table. The Majority 47.6% (10 out of 21) of the patients had Brighton criteria level 2 certainty of diagnosis of GBS, 23.8% of the study population had level 1 diagnosis certainty, 28.6% of patients had level 4 certainty of diagnosis and no(0%) patient had level 3 of certainty.

CHART 13. Brighton certainty of diagnosis levels

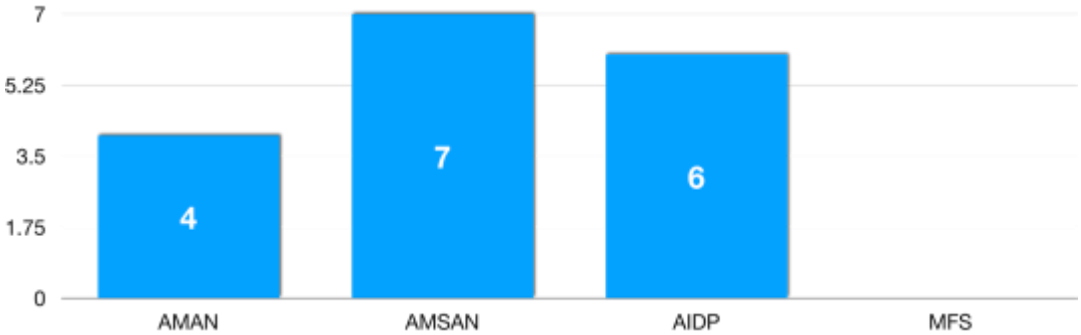


J. CORRELATION BETWEEN GBS AND NCS FINDINGS:

The most common variant found in this study is Acute motor sensory axonal neuropathy(AMSAN) seen in 41.2%(7 of 17) patients. 2nd most common variant seen is Acute inflammatory demyelinating polyneuropathy(AIDP) in 35.3%(6) patients. Acute motor axonal neuropathy(AMAN) variant is seen in 23.5%(4) patients.

No patient had Miller-Fisher Syndrome(MFS).

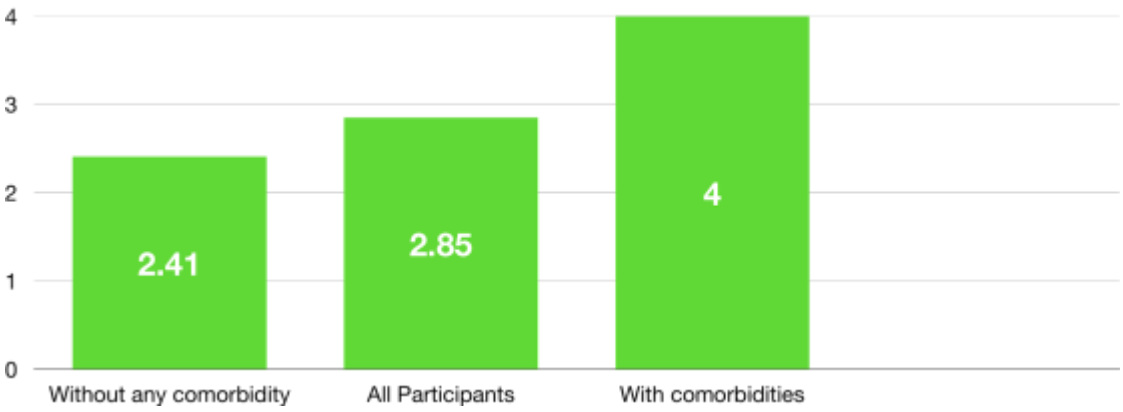
CHART 14. GBS Variants



K. CORRELATION BETWEEN COMORBIDITY AND MEGOS IN GBS PATIENTS:

The mean for mEGOS in GBS patients with comorbidities mentioned in the table is 4±1.79 whereas mean of all the patients in this study is 2.85±2.06 and of patients without any comorbidity is 2.41±2.02.

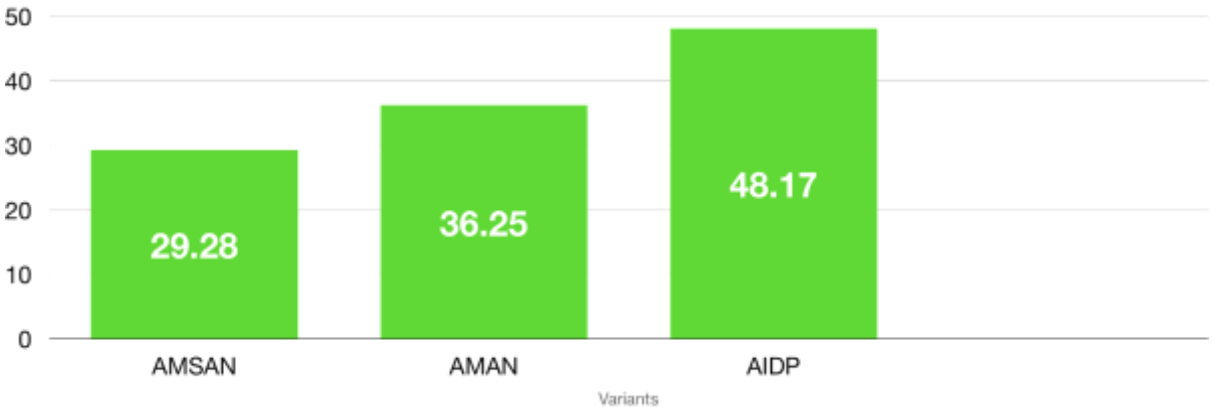
CHART 15. mEGOS in relation to comorbidities



L. CORRELATION BETWEEN AGE AND VARIANTS:

Patients with AIDP variant of GBS had maximum mean age with 48.17±15.8 years, patients with AMAN variant had a mean age of 36.25±13.74 years and patients with AMSAN variant had minimum mean age with 29.28±12.75 years.

CHART 16. GBS variants and age variation



M. CORRELATION BETWEEN mEGOS AND VARIANTS:

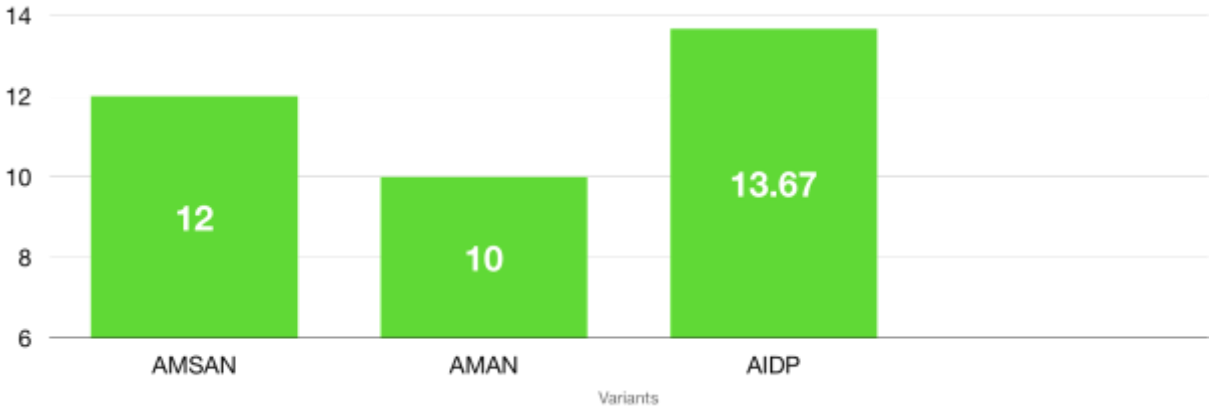
Patients with AIDP variant had highest mean of mEGOS with 3.5±2.89, patients with AMSAN variant had mean mEGOS- 2.57±1.61 and patients with AMAN variant had least mean mEGOS of 1.75±2.06.

CHART 17. GBS variants and mEGOS variation

N. CORRELATION BETWEEN MEAN DURATION OF STAY IN HOSPITAL AND VARIANTS:

In this study, patients with AIDP variant had longest duration of stay in hospital with mean of 13.67±3.44 days, patients with AMSAN had mean duration of stay as 12±5.95 days and patients with AMAN had shortest duration of stay with a mean of 10±3.46 days

CHART18. GBS variants and duration of stay variation



O. CORRELATION BETWEEN CRANIAL NERVE INVOLVEMENT AND VARIANT:

75% (3 out of 4) of patients with Cranial nerve involvement had AIDP variant and 25% patients (1 of 4) had AMSAN variant.

DISCUSSION:

The present study was done on GBS patients in the department of neurology in government general hospital, Rangaraya medical college, Kakinada.

A total of 21 cases of GBS were studied during the study period of 3 months. All patients aged 14 and more of both sexes were included in the study group.

In this study, patients were divided into 6 age groups and GBS was found to be more in the 25-40 age group with 28.6%(6) of all cases. The cases were more or less evenly distributed in age groups of 15 years according as seen in table 3. Hughes et al states that the age distribution of GBS is bimodal, which peaks in younger adults and the elderly with highest incidence in the elderly and stating a hypothesis that normal immune suppression mechanisms fail in old age. This study is not consistent with that of Hughes et al, who showed GBS incidence increase by 20% for every 10-year increase in age[9].The youngest patient in this study presented at the age of 14 years and the oldest at age 83 years.

While studying the sex distribution of GBS, it was found that out of 21 cases, 66.7%(14) were

males and 33.3%(7) were females with occurrence rate more in male patients at 2:1 male to female ratio which is consistent with a study done by Evangelista et al from 1981-1987[10]. This is also consistent with Baughman et al who showed that the risk of GBS was higher for males than females[11]. This was also previously cited by Hughes et al that although unusual for an autoimmune disease, higher incidence rates have been reported in males than females for GBS. Majority 35.7%(5 out of 14) of the males were from the 25-40 age group. Majority 42%(3 out7) of the females were from the 40-55 age group.

While studying the correlation between age groups and mean duration between onset of symptoms and admission, it was found that the 40-55 age group patients presented late to hospital than the rest of the age group patients with a mean of 12.2±10.01 days between the onset of symptoms of GBS and admission to the hospital, for the 55-70 age group it was 4.6±1.52 days, for the 14-25 age group it was 4.6±1.52 and 4 days for one patient ageing 83 years. While the mean of the study for all the patients is 9.76±7.82 days. This study is comparable to that of Gonzalez-Suarez, Ines, et al who showed the time between symptom onset and admission was significantly lower in the severe cases (mean 5.17 days) compared with the mild ones (mean 8.87 days)[12]. The mean of this study for the duration of stay of GBS patients in hospital is 10.85±5.41. The median is 12 days. This study does not correlate well with the study of N van leeuwen et al who showed the Median hospital stay was 17 days[13].

The mean values for duration of stay were more or less evenly distributed in age groups of 15 years according as seen in the table. 7 indicating that the course of the disease may be similar in all the age groups of this study.
The total duration of the disease course can be estimated to be 20.52 days±10.39 days. This finding is consistent with most literature like Brighton criteria.

Alcohol consumption is one of the major risk factors associated with development of GBS with a significant 52.6%(10 out of 19) of the GBS patients were alcohol consumers. This observation is consistent with the study of Y Ding, L Wang et al who found that alcohol consumption was correlated with a higher risk of GBS[14]. This association prompts further studies on the relationship between alcohol consumption and GBS. Alcohol consumption may also have a role in the outcome.

Only 10.5%(2 out of 19) of the GBS patients in this study were smokers.
Other comorbid conditions like Diabetes, Hypertension etc were not significantly associated with GBS.

Only 30% of the patients are noted for Antecedent events. This finding is not consistent with the study of Stephanie L.Barnes et al who showed that Antecedent infection was identified in 61% of patients in the study[15]. The most common antecedent event in this study was fever with cough(10%) as with a possible respiratory tract infection, followed by vomitings(10%), diarrhoea with vomitings(5%) and fever (5%) although majority(70%) of the patients in this study did not note any antecedents events. This observation is comparable to the study by M Koga et al who showed the frequent antecedent symptoms in GBS and related disorders as fever (52%), cough (48%), sore throat (39%), nasal discharge (30%), and diarrhoea (27%)[16]. This could be due to the most common pathogens that are associated with the antecedent events like campylobacter jejuni(32%), cytomegalovirus(13%), Epstein-Barr virus (10%), mycoplasma pneumoniae, haemophilus influenzae etc the observed symptoms like fever, gastroenteritis resulting in diarrhoea and/or vomitings, respiratory tract infections and/or cough etc are seen.

The most common presenting symptom was ascending paralysis (100%) followed by the complaints of sensory impairments(Paraesthesias)(75%) like numbness, tingling, allodynia and pins and

needles sensations. The most common symptoms seen in the patients are as follows : Ascending paralysis(100%), sensory impairment(75%), cranial nerve impairment (25%), dysphagia(5%) and complications like autonomic dysfunction(10%) and respiratory failure (10%). This findings are comparable with the study done by V Ansar et al who showed the following presenting symptoms: Flaccid weakness 100%, Limb areflexia/hyporeflexia 100%, Distal weakness (predominant) 33.3%, Distal sensory loss 38.9%, Cranial nerve VII palsy 31.5%, Proximal weakness (predominant) 27.8%, Palate paralysis 14.8%, Respiratory failure requiring ICU 14.8%, Fluctuating arterial HTN 9.3%, Papilledema 7.4%, Ocular nerve palsy 5.6%, Weakness of jaw 3.7%[17].

Motor impairment with paraparesis type is seen in 55%(11 out of 20) of the patients and quadriparesis type in 45% of the patients which is not consistent with the study done by B van den Berg, C Fokke et al who showed that only 8% of their patients had paraparetic type of motor impairment[18].

Cranial nerve involvement was seen in only in 25%(5 out of 20) patients with involvement of 7th cranial nerve being the most common(20%) followed by 3rd cranial nerve(5%) and bulbar nerve involvement(5%)in this study which is not consistent with the study of Amita Bhargava et al who showed 62.3% patients had cranial nerve involvement out of which majority 49.2% had bulbar palsy, 46% had facial nerve palsy, 10% had hypoglossal nerve involvement and 6.5% had ophthalmoplegia[19]. These neurological symptoms mentioned are thought to be due to autoimmune antibody production through molecular mimicry against the myelin sheath(Schwann cells) and/or the axons resulting in inflammatory demyelination and axonal loss respectively.

Total areflexia was seen only in 33% of the patients and lower limb areflexia was seen in 16.7% patients. Reflexes(Deep tendon reflexes) with or without hyporeflexia were seen in 66.7% of patients. Hyperreflexia was in 11.1% of patients which is consistent with the study by S. Kawabata et al who showed 13% patients developed hyperreflexia in their study[20]This observation may imply that all GBS variants and subtypes can present with hyperreflexia (and also normoreflexia) making this eventuality mentionable in diagnostic criteria for GBS.

The mean mEGOS in this study is 2.85±2.06 whereas the highest(4.75±2.63) is seen in the older 55-70 years age group and the lowest(1±1.00) is seen in the 25-40 years age group. mEGOS is a validated tool to predict the inability to walk unaided at 4 and 26 weeks in patients with GBS and higher mEGOS correlates with poorer prognosis and outcomes. A very strong positive correlation(r=0.99) is seen between mEGOS and the duration of stay in the hospital for the 55-70 age group. These results show that the older age groups are at increased risk for graver outcomes. These are also consistent with the study of J Yao et al who showed that patients having higher mEGOS scores at admission significantly correlated with short-term outcomes[21]. It could be due to the same reasons that reflexes of damaged nerves are lost.

Majority of the patients in this study have level 2 of Brightons certainty o
f diagnosis, 32% of the study population had level 1 diagnosis certainty and 29% of patients had a level 4 certainty of diagnosis. This is consistent with the study of JMG Amante et al who showed that the majority 38% of the patients had a Brighton criteria level 2 certainty of diagnosis[22].

As shown earlier, the most common variants according to nerve conduction studies(ncs) were AMSAN(41.2%), AIDP(35.3%) , AMAN(23.5%), MFS(0%). In most literature, AMAN is the more common variant seen along with AIDP although there was one study reporting that the majority of their population has a MFS variant. In North America and Europe, around 5% of the patients with GBS have the axonal subtypes(AMAN & AMSAN). Central and South America, Japan

and China have axonal subtypes that account for 30-47% of the cases and Miller-Fisher syndrome has been found to account for around 5% of cases of GBS. This study result is comparable with that of JMG Amante et al who showed the common GBS variants according to nerve conduction studies were AMSAN (38%), MFS (23%), AIDP (14%) and AMAN (8.8%). This study is not consistent with the study of G Deepak, N muraleedharan et al who showed that the majority(85.2%) of their patients had AIDP variant[23].

Patients who presented with AMSAN variant of GBS had a mean age of 29.28±12.75 years, patients with AMAN variant had a mean age of 36.25±13.74 and patients with AIDP variant had a mean age of 48.17±15.8. This study is consistent and comparable to that of Deepak, muraleedharan et al who found that AIDP occurred in all age groups, with a peak incidence in the fourth and sixth decades and least incidence at extremes of ages, AMAN in contrast predominated in the younger population (younger than 40 years) in their study[24].

The mean duration of stay for patients in this study with AIDP variant is 13.67±3.44 days which is the longest, and for AMSAN variant it was 12±5.95 days, and for AMAN variant it was the shortest 10±3.46 days. The finding for AIDP variant in this study is comparable to that of Patel P et al who showed the mean duration of hospital stay for the AIDP variant(n=27) as 15 days but the average stay for axonal variants (AMAN and AMSAN)(n = 20) was not consistent as it was 18 days (p = 0.03)[25].

In this study patients with AMAN variant had the lowest mean mEGOS of 1.75±2.06, AMSAN variant had mean mEGOS of 2.57±1.61 and patients with AIDP variant had the highest mean mEGOS of 3.5±2.89. The mEGOS mean values are also correlated with the durations of hospital stay as seen in table 18. AIDP variant correlated with highest mean mEGOS at admission and longest duration of hospital stay in this study whereas AMAN variant is correlated with lowest mean mEGOS at admission and shortest mean duration of hospital stay.

CONCLUSIONS AND SUMMARY:

The present study was done on GBS patients in the department of neurology in government general hospital, Rangaraya medical college.

A total of 21 GBS patients were studied for a period of 3 months (September 2023 to November 2023) involving both sexes and patients ageing 14 years and above.

- Incidence of GBS was higher in males compared to females and was statistically significant.
- Although the cases of GBS were distributed almost evenly among the age groups, the age group 25-40 years had the highest incidence.
- The duration between onset of GBS symptoms and admission is longest for the age group 40-55 years.
- Majority of the GBS patients were found to be alcohol consumers.
- Majority of the GBS patients were not smokers.
- Duration of stay in the hospital for GBS patients was longest in the age group 25-40 years.
- The GBS patients of age group 55-75 years had the highest mean for mEGOS at the time of admission.
- If present, the most common antecedent events are fever and vomiting.
- Ascending paralysis and sensory impairment like paraesthesias are the major clinical features in GBS patients.
- Majority of the GBS patients had Brighton criteria level 2 certainty of diagnosis of GBS.
- The most common variant of GBS in this study is the AMSAN variant.
- GBS Patients having comorbidities had higher mEGOS mean values at the time of admission.
- The most common GBS variant in older patients in this study is AIDP, whereas in younger patients AMSAN variant is most common.

- AIDP variant had the highest mean mEGOS at the time of admission, AMAN variant had the lowest.
- The patients with AIDP variant had the longest duration of stay in hospital and patients with AMAN variant had the shortest.
- Majority of the patients with AIDP variant had cranial nerve impairment.

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