A Prospective Study of Guillain-Barre Syndrome Cases Among Adults Admitted in Al Gamhouria Teaching Hospital and Private Hospital in Aden City - Yemen

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Abstract

Background: Guillain-Barre syndrome (GBS) is an acute autoimmune-mediated peripheral nervous system disease. Different studies from various geographical regions have reported considerable variability regarding its demographic data, clinical features, subtype and outcome.

Aim of Study: This study aimed to describe the demographics, clinical patterns, subtypes and outcome of patients with Guillain-Barre syndrome admitting in Al-Gamhouria Teaching Hospital and a private hospital in Aden City in Yemen.

Patients and Methods: It was a prospective study carried out in Al Gamhouria Teaching Hospital and a private hospital in Aden City Southwest of Yemen, over a period of three years, Between (February 2020 to February 2023), it included 30 patients >16 years of age diagnosed with with Guillain-Barre syndrome.

Results: During the study period, 30 patients were enrolled, mean age was (31±6) years, (60%) of cases were male while (40%) being female, half of patients belonging to the age group of (16-39) years (50%), Prior history of infection was detected in (67%) of patients, sensorimotor form, was the most common form, it was (63%), demyelinating lesion subtype composed (57%) while axonal lesion subtype (43%), (20%) of the patients subjected to mechanically ventilated, while (80%) of patients have not been ventilated.

Conclusion: This study concluded that young, middle age male patients were the majority of cases, demographics, clinical, and eletrodiagnostic results similar to those reported in previous studies, majority of cases were not being ventilated.

Key Words: Guillain-Barre syndrome – Sensorimotor form – Demyelinating lesion.

Introduction

GUILLAIN-BARRE syndrome (GBS) is an acute immune mediated polyneuropathy characterized by flaccid and rapidly progressive paresis that is symmetrical, ascending and reflexes are absent or diminished [1].

GBS is mediated by humeral and cellular responses that directly destroy the myelin sheath of axons of peripheral nerves [2]. Although GBS variants share immunomediated pathogenesis, they differ in their pathophysiology, clinical presentations and endpoints, and are classified into different subtypes. For example, immune reactions against epitopes of Schwann cell surface membranes or myelin result in demyelinating neuropathy, while those directed against axonal membrane antigens cause the acute axonal form of the syndrome [3].

It is a major cause of acute neuromuscular paralysis and causes respiratory failure requiring ventilator support in approximately 25% with a mortality rate of 4-15%. The annual incidence of GBS is 1.3-4 per 100,000 all over the world [4,5,6]. Men are approximately 1.5 times more affected than women [7].

The GBS is believed to include a variety of acute neuropathies with underlying immune-mediated pathogenic mechanisms rather than a single disease; therefore, GBS recognized variants are considered as syndromes including (acute inflammatory demyelinating polyneuropathy) AIDP (acute motor axonal neuropathy) AMAN (acute motor-sensory axonal neuropathy) AMSAN and (Miller-Fisher syndrome). The most prevalent form of GBS reported is AIDP, which is responsible for 70-90% of cases [8,9]. In addition to history and clinical examination, confirming the diagnosis of GBS may include cerebrospinal fluid analysis (CSF) and electroneurodiagnostic testing, both of which can be normal in the early phase of the disease [10,11].
Patients and Methods

This was a prospective study carried out in Al Gamhouria Teaching Hospital and a private Hospital in Aden City Southwest of Yemen, 30 patients with Guillain-Barre syndrome enrolled in this study and admitted to Department of Internal Medicine and Intensive Care Unit over a period of three years, Between (February 2020 to February 2023).

All patients were subjected to full medical history, neurological examination and routine laboratory investigations included Random blood sugar, complete blood picture, Serum urea, Serum creatinine, Serum electrolytes (sodium, potassium, and calcium), Erythrocyte sedimentation rate, and electro diagnostic studies.

Diagnosis of Guillain-Barre syndrome was assessed by Brighton criteria [12,13] which included (1) Acute or sub acute flaccid weakness involving lower and/or upper limbs; (2) Monophasic disease, reaching nadir of weakness between 12h and 4 weeks; and at least one of the following: (a) Hyporeflexia or areflexia in the weak limbs, (b) Cytoalbuminological dissociation defined as the combination of cerebrospinal fluid (CSF) protein level >0.45g/L and cell count <50 cells/μl, and (c) the reported electrophysiological features are compatible with a subtype of GBS.

Data was collected from patients using a predetermined questionnaire, particular emphasis being given to, sex, age, Prior history of infection (including diarrhoea, respiratory infections or unexplained fever, neurological symptoms and signs at time of arrival, subtypes of neuropathy by electrophysiological study and decision of mechanical ventilation.

Lumber puncture for cerebrospinal fluid analysis skipped due to patients rejection.

Patients grouped according to clinical form into sensorimotor form, pure motor form (cases were not preceded or associated with sensory findings) and cranial nerve involvement in the two forms (Which included facial weakness, oropharyngeal weakness, and ophthalmoplegia).

A neuro muscular specialist performed electrophysiological examinations within 2 weeks of the onset of illness in all patients. Nerve conduction studies with evaluation of median, ulnar, common peroneal, tibia and surusal nerves were performed in all. Needle electromyogram (EMG) was done in at least two proximal and two distal limb muscles, for assessment of denervation and motor unit action potential changes, in all patients. Patients were classified as having axonal or demyelinating subtype based on the electro diagnostic criteria given by Hadden et al. [14].

Inclusion criteria included patients with GBS diagnosis fit Brighton criteria, >16 years old, both gender.

Exclusion criteria included patients with other causes of polyneuropathy such as diabetic, uremic, drug-related neuropathy, para neoplastic neuropathy or hereditary neuropathy, previous trauma leading to paraparesis, previous neuromuscular weakness, poliomyelitis, periodic paralysis, transverse myelitis, and diphtheria all were excluded from the study.

The result was calculated manually, and presented as means, percentages and tables as appropriate.

Ethical consideration: Verbal informed consent was obtained from all participating subjects; the study design was approved by the research and ethics committee in the Faculty of Medicine University of Aden.

Results

A total of (30) subjects were included in this study All the patients had GBS, their age range from (17 to 69) with a mean value (31±6) SD years

The sex distribution in Table (1) showed a prominence of male gender (60%) versus (40%) being female a male-to-female ratio of (1.5:1).

Table (2) showed maximum of patients belonging to the age group of (16-39) years (50%).

Table (3) revealed that (67%) of patients enrolled in the study had Prior history of infection included (respiratory tract infection, diarrhoea or nonspecific fever).

Table (4) demonstrated the Clinical forms where (63%) of patients presented with sensorimotor form, which was the most common form at time of arrival followed by pure motor form (37%), cranial nerve involvement was (10%) of cases included in this study.

Table (5) demonstrated the result of electro diagnostic study, where Demyelinating subtype composed (57%) while axonal subtype (43%).

Table (6) revealed the outcome of subjects enrolled in this study (20%) of the subjects mechanically ventilated, while (80%) of patients have not been ventilated.
Table (1): Distribution of patients according sex.

<table>
<thead>
<tr>
<th>Sex</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>18 (60%)</td>
</tr>
<tr>
<td>Female</td>
<td>12 (40%)</td>
</tr>
</tbody>
</table>

Table (2): Distribution of patients according age.

<table>
<thead>
<tr>
<th>Age group</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 - 39 years</td>
<td>15 (50%)</td>
</tr>
<tr>
<td>40 - 59 years</td>
<td>12 (40%)</td>
</tr>
<tr>
<td>60 - 70 years</td>
<td>3 (10%)</td>
</tr>
</tbody>
</table>

Table (3): Distribution of patients according the presence of prior history infection.

<table>
<thead>
<tr>
<th>Prior history infection</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present</td>
<td>20 (67%)</td>
</tr>
<tr>
<td>Absent</td>
<td>10 (33%)</td>
</tr>
</tbody>
</table>

Table (4): Clinical forms of GBS at time of arrival.

<table>
<thead>
<tr>
<th>Clinical forms of GBS at time of arrival</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pure motor form</td>
<td>11 (37%)</td>
</tr>
<tr>
<td>Sensorimotor form</td>
<td>19 (63%)</td>
</tr>
<tr>
<td>Cranial nerve involvement</td>
<td>3 (10%)</td>
</tr>
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</table>

Table (5): Distribution of patients according the electrophysiological subtypes.

<table>
<thead>
<tr>
<th>Electrophysiological subtypes</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demyelinating subtype</td>
<td>17 (57%)</td>
</tr>
<tr>
<td>Axonal subtype</td>
<td>13 (43%)</td>
</tr>
</tbody>
</table>

Table (6): Distribution of patients according to decision of mechanical ventilation.

<table>
<thead>
<tr>
<th>Mechanical ventilation</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>6 (20%)</td>
</tr>
<tr>
<td>No</td>
<td>24 (80%)</td>
</tr>
</tbody>
</table>

Discussion

The majority of patients were related to the age group of (16-39) years (50%). Approximately near the result mentioned by Alanazy et al., [19] retrospective multicentre study conducted in Saudi Arabia and published in 2021, where approximately, half of the patients (51.9%) were aged 18-39 years.

Prior history of infection included (respiratory tract infection, diarrhoea and nonspecific fever) was presented in (67%) of cases recruited in this study, similar to the result reached by Chaudhuri et al., [20] study from Yashoda Hospital in Hyderabad South India published in 2014 included 37 patients where Prior history of infection constitutes (67%).

Literature review revealed that two-thirds of patients with GBS have an antecedent respiratory or gastrointestinal tract infection in the 6 weeks preceding the onset of GBS [21].

According to the clinical forms, sensorimotor form constitute (63%) of cases enrolled in this study closely related to findings obtained in Alloush et al., study [22] conducted at Ain Shams university hospitals and Kobri Elkoba Military Hospital including twenty patients with the diagnosis of GBS in the duration from 2016 to 2018 and published in 2019, and Alanazy et al., [19] retrospective multicentre study conducted in Saudi Arabia where sensorimotor form was (60.0%), (64.1 %) respectively.

While isolated pure motor form composed (37%), close to Alanazy et al., [19] where pure motor forms was (34.6%).

Cranial nerve involvement was (10%) in this study near to (9.7%) reached by Bhagat et al., in eastern Nepal [16].

Acute inflammatory demyelinating polyradiculoneuropathy (AIDP) subtype composed (57%) while axonal subtypes included acute motor axonal neuropathy (AMAN), and acute motor-sensory axonal neuropathy (AMSAN) composed (43%), close to results obtained by Sharma et al., study [23] conducted in India and published in 2011 and included 50 patients with GBS, 30 had AIDP (60%), 20 had axonal subtypes (40%).

In retrospective study from Northern China reported different frequencies of the electrophysiological subtypes of GBS, AMAN was the predominant subtype (55.8%) and AIDP occurred less frequently (21.2%) [24].

This variation in the distribution of subtypes between countries may be related to the exposure
to different types of infections; however, the genetic characteristics of the population may also have an effect [25].

Only 6/30 patients (20.0%) needed mechanical ventilation, similar to the result present in the Egyptian Study of Alloush et al. [22] 4/20 (20%), higher than result of Al Maawali et al., in Oman [18] were 13.6% admitted to ICU for mechanical ventilation.

Recommendations:

Due to the very limited data, which is available in Yemen on this important issue, our results can be used as baseline data for understanding the characteristics of GBS in Yemen.

Further studies, which contain larger samples of GBS patients, from different healthcare centers and hospitals, needs to be carried out to achieve more reliable and representative data, which can lead to the best outcomes.

References

دراسة مستقبليّة لحالات متلازمة غيلان باري بين البالغين الودعيين في مستشفى الجمهورّية التعليميّي في مدينة عدن اليمن

المقدمة: تعتبر متلازمة غيلان باري مرضٌ داء يصيب الجهاز العصبي الطرفي بوساطة مناعية، أشارت دراسات مختلفة من أمان جرفافية متعددة إلى تنوء واسع في البيانات الديموغرافية، السمات السريريّة، الأنواع الفرعية وخصائص المخرجات.

الأهداف: قصدت الدراسة إلى وصف الديموغرافية، الصورة السريرية، الأنواع الفرعية وخصائص المخرجات لمرضى متلازمة غيلان باري الودعيين في مستشفى الجمهورّية التعليمي في مدينة عدن اليمن.


شملت الدراسة ثلاثين مريض تم تشخيصهم بمتلازمة غيلان باري، تجاوزت أعمارهم 16 سنة.

النتائج: فمثّل ادراك ثلاثين مريضا خلال فترة الدراسة، كان متوسط العمر (40±1) عامًا. شكل الذكور 80% بينما الإناث 20%. من الضروري كانون من الفئة العمرية، 40% لوحظ وجود تاريخ سابق للعوامل في 47% من المرضى، كان الشكل الحسي الحركي أكثر الأشكال شيوعًا 37%، شكل نوع الإصابة المزمنة للمرض 50% شكل نوع الإصابة المزمنة في 43% من المرضى، خضعا للتنفس الصناعي، بينما 50% لم يضروا له.

الخلاصة: خصصت الدراسة إلى أن المرضى الذكور الصغار ومتوسط العمر شكوا أغلبية الحالات. النتائج الديموغرافية، السريريّة والكهربائيّة التشخيصية مشابهة للنتائج المشاركة في الأبحاث السابقة، أغلبية الحالات لم تخفق للتنفس الصناعي.