CLINICAL PRESENTATIONS AND COMPLICATIONS OF GUILLAIN BARRE SYNDROME IN CHILDREN WELFARE TEACHING HOSPITAL

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ABSTRACT

Background: Guillain Barré syndrome is an acute inflammatory demyelinating disease of the peripheral nerves. Its synonyms are: acute inflammatory demyelinating polyradiculoneuropathy, idiopathic polyneuritis, acute infective polyneuropathy and post infections polyneuritis.

Objectives: We attempt to study the clinical presentations and complications in patients with GBS who were admitted to children welfare Teaching Hospital and to compare the results with the other studies.

Type of the study: A retrospective study.

Methods: A study done on seventy patients with GBS who were admitted to children Welfare Teaching Hospital in Medical City-Baghdad from different parts of Iraq between January 2002-December 2006.

Results: Forty (57.14%) of them were males and 30(42.86%) were females, a male to female ratio 1.33:1. There were more cases during winter months. Antecedent events were found in 44 patients (62.86%),26 patients (37.14%) had no history of antecedent events. It was found that 24 patients (34.3%) had only bilateral lower limbs weakness and 46 patients (65.7%) had both bilateral lower and upper limbs weakness. Sensory manifestations occurred in 35 patients (50%). Cranial nerves involvement was observed in 25 patients (35.7%). Autonomic nerves involvement was observed in 9 patients (12.9%). Respiratory muscles were involved in 20 patients (28.6%), 11 patients (15.7%) were admitted to the RCU and needed ventilator setting, 3 patients (4.28%) died in RCU. The results were compared with similar studies from other parts of the world.

Conclusions: This study showed that there is no specific pattern of motor weakness involvement and all cases show symmetrical muscle weakness.Bulbar nerves (glossopharyngeal and vagus nerves) involvement is the commonest cranial nerve involvements.Autonomic nerves involvement and respiratory muscles involvement are the main cause of death in GBS. GBS patients should be admitted to the hospital and RCU with ventilator setting should be available along with well trained medical staff. Because the disease may run a prolonged course, we recommend close follow up of the patient to see the end result at that time.

Keywords: Guillain Barré syndrome, clinical presentations, complications.

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Guillian Barre syndrome is a postinfectious polyneuropathy involving mainly motor but sometimes also sensory and autonomic nerves. It affects people of all ages and is not hereditary. Most patients have demyelinating neuropathy. Since poliomyelitis has nearly been eliminated, the Guillain-Barré syndrome is currently the most frequent cause of acute flaccid paralysis worldwide and constitutes one of the serious emergencies in neurology. A common misconception is that the Guillain-Barré syndrome has a good prognosis , but up to 20% of patients remain severely disabled and approximately 5% die, despite immunotherapy.[1,2] Various studies of the immunopathogenesis of the Guillain-Barré syndrome suggest that the disease actually encompasses a group of peripheral-nerve disorders, each distinguished by the distribution of weakness in the limbs or cranial-nerve-innervated muscles and underlying pathophysiology. [3-4] There is substantial evidence to support an autoimmune cause of this syndrome, and the autoantibody profile has been helpful in confirming the clinical and electrophysiological relationship of the typical Guillain-Barré syndrome to certain other peripheral-nerve conditions.[5] The reported incidence of the Guillain-Barré syndrome in Western countries ranges from 0.89 to 1.89 cases (median, 1.11) per 100,000 person-years, although an increase of 20% is seen with every 10-year rise in age after the first decade of life.[6]) The ratio of men to women with the syndrome is 1.78 .Two thirds of cases are preceded by symptoms of upper respiratory tract infection or diarrhea. The most frequently identified

infectious agent associated with subsequent development of the Guillain-Barré syndrome is *Campylobacter jejuni*(30%)[7] whereas cytomegalovirus has been identified in up to 10%.[8,9] The incidence of the Guillain-Barré syndrome is estimated to be 0.25 to 0.65 per 1000 cases of *C. jejuni* infection, and 0.6 to 2.2 per 1000 cases of primary cytomegalovirus infection.[10] Other infectious agents with a well-defined relationship to the Guillain-Barré syndrome are Epstein- Barr virus, varicella-zoster virus, and *Mycoplasma pneumoniae*. [11,12,13]. the demyelinating form of the disease is the most common, and probably represents at least 75% of cases[14]. The paralysis usually follows a non specific viral infection by about 10 days. The original infection may have been caused by gastrointestinal (especially campylobacter jejuni) or respiratory tract (especially mycoplasma pneumoniae) symptoms. Weakness begins usually in the lower extremities and progressively involves the trunk, the upper limbs and finally the bulbar muscles, a pattern known as Landry ascending paralysis, proximal and distal muscles are involved relatively symmetrically, but asymmetry is found in 9% of the patients. [15]

The onset is gradual and progresses over days or weeks, particularly in cases with an abrupt onset, tenderness on palpation and pain in muscles is common in the initial stages. Weakness may progress to inability or refusal to walk and later to flaccid tetraplegia. Paresthesias occur in some cases[16].The Miller-Fisher syndrome consist of acute external opthalmoplegia, ataxia, and areflexia[17]. Papilloedema is found in some cases. Urinary incontinence or retention of urine is a complication in about 20% of cases but is usually transient[18]. The autonomic nervous system may also be involved in some cases.variety of spontaneous potentially life threatening cardiac arrhythmia such as paroxysmal atrial tachycardia, episodes of profound bradycardia, and occasional asystole occur. Cardiovascular monitoring is important[19].

CSF studies are essential for diagnosis. The dissociation between high CSF protein and a lack of cellular response in a patient with an acute or subacute polyneuropathy is diagnostic of GBS[20]. Motor nerve conduction velocities are greatly reduced, The motor NCV may be normal in 15-20% in the first few days of onset[21]. An electromyogram shows evidence of acute denervation of muscle. Serum creatine phosphokinase level may be mildly elevated or normal. Antiganglioside antibodies, mainly against GM1 and GD1, are sometimes elevated in the serum in GBS, particularly in cases with primarily axonal rather than demyelinating neuropathy [22]

Rapidly progressive ascending paralysis is treated with IVIG at a dose of 0.4 g/Kg/day for 5 days [23]. Plasmapheresis, steroids, and/or immunosuppressive drugs are alternatives, if IVIG is ineffective Plasma exchange clearly removes a blood borne substances mediating the neuropathy, Supportive care, such as respiratory support and treatment of secondary bacterial infections is important[24].The clinical course is usually benign, and spontaneous recovery begins within 2-3 week. Improvement usually follows a gradient inverse to the direction of involvement, with recovery of bulbar function first and lower extremity weakness resolving last. The tendon reflexes are usually the last function to recover[16]. Three clinical features are predictive of poor outcome with sequelae: cranial nerve involvement, intubation, and maximum disability at the time of presentation. An electrophysiologic feature of conduction block, by contrast, is predictive of good outcome[16].

In this study, we attempt to study the clinical presentations and complications in patients with GBS who were admitted to children welfare Teaching Hospital and to compare the results with other studies.

Patients & Methods: A retrospective study done on seventy patients with GBS who were admitted to children Welfare Teaching Hospital in Medical City-Baghdad from different parts of Iraq between January 2002-December 2006.

The variables for analysis in this study include: age, sex, residence(rural or urban), antecedent event, presentation, type of motor weakness, sensory symptoms, cranial and autonomic nerves involvement, respiratory muscles involvement, admission to RCU and death rate. Lumbar puncture was done for 54 patients only (30 patients in the first week and 24 patients after the first week of presentation). Nerve conduction study was done for 16 patients.

The criteria which had been applied in this study is the same diagnostic criteria of GBS after Asbury and Cornblath that includes the following:

Features required for diagnosis: Progressive motor weakness of more than one limb and Loss of tendon jerks.

Features strongly support the diagnosis: clinical features: Progression over 4 weeks, Relative symptoms of weakness, Mild sensory signs or symptoms, Cranial nerves involvement, Recovery usually beginning 2-4 weeks after progression stop, Autonomic dysfunction, Absence of fever at the onset of neurological symptoms. In addition to raised CSF protein and cells count less than 10 cell/mm^3 along with Reduction of conduction velocity on electromyography.

Features that rule out the diagnosis: Indication of any metabolic or infectious diseases associated with polyneuropathy or Occurrence of purely sensory syndrome.

Statistical analysis: Data were gathered; organized and tabulated using Microsoft Office Word 2010 , percentages and tables were done by Microsoft Office Excel 2010. Discrete variables presented as numbers and percentages

Results: Seventy patients, 40 males (57.14%) and 30 females (42.86%), with a male: female ratio of 1.33:1 (Fig. 1). Patients age ranges between 9 months – 12 years, 52 of patients (74.285%) were between 1-4 years of age (Table 1). There were more cases during winter months(Fig.2). Forty four patients (62.86%) had history of antecedent events [upper respiratory tract infections in 36 patients (51.43%), gastroenteritis in 5 patients (7.14%), oral polio vaccine in 2 patients (2.86%) before 2 weeks, hepatitis in 1 patient (1.43%)].Twenty six patients (37.14%) had no history of antecedent events (Table 2). All patients in this study had motor weakness, only bilateral lower limbs weakness in 24 patients (34.3%), bilateral lower and upper limbs weakness in 26 patients (37.1%) and both lower and upper limbs weakness with involvement of respiratory muscles in 20 patients (28.6%) (Table 3). Sensory manifestations occurred in 35 patients (50%), 26 patients (37.14%) had pain sensation and 9 patients (12.86%) had paraesthesia (Table 4). Cranial nerves involvement was observed in 25 patients (35.7%); the glossopharyngeal and vagus nerves were involved in 19 patients (27.1%), 3 patients (4.3%) had facial nerve involvement and abducent nerve was involved in 3 patients (4.3%), (Table 5). Autonomic nerves involvement was observed in 9 patients (12.9%); urine incontinence in 5 patients (7.2%), urine retention in 2 patients (2.9%), hypertension in 1 patient (1.4%) and tachycardia in 1 patient (1.4%) (Table 6).Respiratory muscles were involved in 20 patients (28.6%), 11 patients (15.7%) were admitted to the RCU and needed ventilator setting, 3 patients (4.22%) were died in RCU.

CSF protein level in 30 patients done in the first week was showed that 15 patients (50%) had normal CSF protein level and 15 patients (50%) showed elevated CSF protein (Table 7). CSF protein level in patients done after the first week showed that all the 24 patients (100%) had elevated CSF protein level (Table 8). CSF cells count was increased only in 10 patients (18.5%) and mostly lymphocyte (Table 9). Fifty patients (71.4%) need less than 2 weeks of hospitalization and 3 patients (4.3%) need prolonged hospitalization (more than 12 weeks), all patients were admitted to the RCU need hospitalization more than 4 weeks (Table 10).

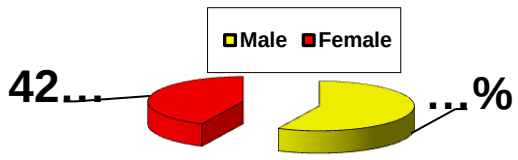

Figure (1): Male: Female ratio with GBS 1.33:1

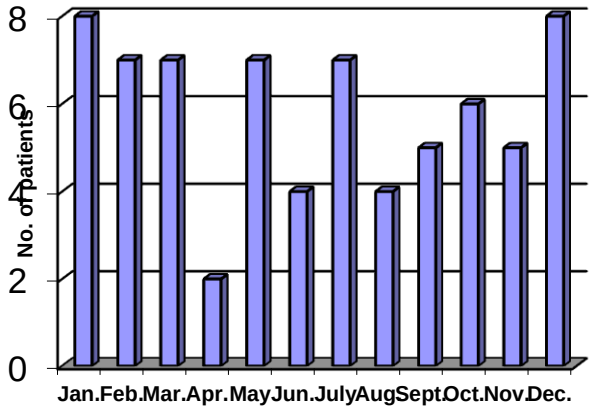

Figure (2): Monthly distribution of GBS cases.

Table (1): Age and sex distribution in patients with GBS.

Age in years	Male No.	%	Female No.	%	Total No.	%
< 1	1	1.428	1	1.428	2	2.856
1-4	31	44.285	21	30	52	74.285
> 4-9	7	10	7	10	14	20
> 9-12	1	1.428	1	1.428	2	2.856
Total	40	57.141	30	42.856	70	100

Table (2): Antecedent Events in patients with GBS

Type of antecedent events	No. of patients	%
Upper respiratory tract infection	36	51.43
Gastroenteritis	5	7.14
Oral polio vaccine	2	2.86

Hepatitis	1	1.43
No antecedent event	26	37.14
Total	70	100

Table (3): Motor manifestation in patients with GBS

Clinical features	No. of patients	%
Bilateral lower limbs weakness only	24	34.3
Bilateral lower and upper limbs weakness	26	37.1
Bilateral lower and upper limbs weakness with involvement of respiratory muscles	20	28.6
Total	70	100

Table (4): Sensory manifestations in patients with GBS

Sensory manifestation	No. of patients	%
Pain	26	37.14
Paraesthesia	9	12.86
None	35	50
Total	70	100

Table (5): Cranial nerves involvement in patients with GBS

The cranial nerves	No. of patients	%
Glossopharyngeal + vagus nerve	19	27.1
Facial nerve	3	4.3
Abducent nerve	3	4.3
None	45	64.3
Total	70	100

Table (6): Autonomic nerves involvement in patients with GBS

Signs & symptoms	No. of patients	%
Urine incontinence	5	7.2
Urine retention	2	2.9
Hypertension	1	1.4
Tachycardia	1	1.4
None	61	87.1
Total	70	100

Table (7): CSF protein in patients with GBS which was done in the first week of presentation.

Protein level in CSF (mg/dl)	No. of patients	%
20-45 mg/dl	15	50
46-100 mg/dl	12	40
101-200 mg/dl	1	3.33
> 200 mg/dl	2	6.67

Total	30	100

Table (8): CSF protein in patients with GBS which was done after the first week of presentation.

Protein level in CSF (mg/dl)	No. of patients	%
20 - 45	0	0
46 - 100	8	33.33
101 - 200	10	41.67
> 200	6	25
Total	24	100

Table (9): CSF cells count in patients with GBS.

No. of cells / mm^3	No. of patients	%
< 5	44	81.5
5 - 50	10	18.5
Total	54	100

Table (10): Duration of hospitalization in patients with GBS.

Time (weeks)	No. of patients	%
< 2	50	71.4
2 - 4	9	12.9
> 4 - 8	4	5.7
> 8 - 12	4	5.7
> 12	3	4.3
Total	70	100

Discussion: The age and sex of the patients were analyzed that showed male: female ratio of (1.33:1), this is in agreement with other studies which show male predominant [25,26,27],but the ratio disagree with a study done by Zielinska who found female predominant (1.13:1)[28]. The age distribution in the majority of patients was 1-4 years and this is in agreement with others[29]. There were more cases during winter months and this agrees with other study [3].

Neurological manifestation was preceded by antecedent events in 44 patients (62.86%) which was slightly less than other studies[30].The antecedent event precede paralysis by about a 9 days which agrees with other study[11], upper respiratory tract infections in the majority of cases 36 patients (51.43%), then gastroenteritis in 5 patients (7.14%) and this agrees with other studies[30,31], while Zhonghau suggested that occurrence of GBS may correlate to infection with Campylobacter jejuni[32], a result not found in this study. All patients in this study show motor weakness which was symmetrical in all cases (100%), with involvement of both lower and upper limbs in 46 patients (65.7%) and involvement of only lower limbs in 24 patients (34.3%), these results were similar to other study[26]. Sensory manifestations had occurred in 35 patients (50%), 26 patients (37.14%) had pain sensation and 9 patients (12.86%) had paraesthesia, and these results are less than other studies[26,30].

Respiratory muscles were involved in 20 patients (28.6%), 11 patients (15.7%) were admitted to the RCU and needed ventilator setting, these results agree with M.N Al-Nadawi study that showed (34.6%) of patients had respiratory muscles involvement but differ in the number of cases that needed ventilator setting which showed more percentage (28.8%)[30].

CSF protein level was elevated in 15 patients (50%) of patient in whom CSF was done in the first week of presentation, CSF protein level was elevated in all the 24 patients (100%) in whom CSF was done after the first week of presentation, this agrees with other studies[27,30], CSF cells count was increased in 10 patients (18.5%) and mostly lymphocyte with CSF contained up to 30 cell/mm^3, this is in agreement with most studies[16,29,30].

All patients were admitted to the RCU need prolonged hospitalization and this is in agreement with other study[1].In this study, 3 patients (4.28%) died in RCU due to the complications of illness or secondary bacterial infections, this death rate was less than that which was found in a study done by Thompson (8%)[24], a study done by Tabaraki (7%)[27] and a study done by M.N. Al-Nadawi (13.5%)[30].

Cranial nerves involvement was observed in 25 patients (35.7%), this result is approximately similar to the results of other studies done by Saleh Al-Ajlouni and M.N Al-Nadawi which show cranial nerves involvement in 38.4%

and 38.5% respectively[26,30]. The glossopharyngeal and vagus nerves were the most frequently affected, in 19 patients (27.1%) and this is in agreement with Tabaraki, B.[27] and M.N. Al-Nadawi (21.2%)[30]. The facial and abducent nerves were involved in 3 patients only (4.3%) which is less than the study done by M.N. Al-Nadawi which showed facial nerve involvement in (9.6%) and abducent nerve involvement in (7.6%)[30], and these percentages are against the studies for adults which showed the commonest cranial nerve involved being the facial nerve[30, 33].

Autonomic nerves involvement were observed in 9 patients (12.9%), which is approximately similar with the results of M.N. Al-Nadawi study in which autonomic nerves were involved in 15.4%[30] but there was difference in the distribution of autonomic nerves involvement in both studies as this study showed that the commonest autonomic nerves involvement was the urine incontinence which was observed in 5 patients (7.2%) and the least common were the hypertension and tachycardia, each of them was involved in 1 patient only (1.4%), while in M.N Al-Nadawi study, the commonest autonomic nerves involvement was the cardiac arrhythmia (5.7%) and the least common was the urine incontinence (1.9%)[30].

Conclusions

- There is no specific pattern of motor weakness involvement (both proximal and distal muscles group are involved almost equally), and all cases show symmetrical muscle weakness.
- Bulbar nerves (glossopharyngeal and vagus nerves) involvement is the commonest cranial nerve involvement.

Recommendations

- Any patient with GBS should be admitted to the hospital and RCU with ventilator setting should be available with good number of trained medical staff.
- Case-sheet of patients with GBS should be informative, including good medical history, complete physical examination, all required investigations and any given treatment.

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