Original Article

OUTCOME OF GUILLAIN - BARRE SYNDROME IN DMCH ICU - A 5 YEARS EXPERIENCE

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ABSTRACT :

Guillain - Barre Syndrome (GBS) is the commonest peripheral neuropathy causing ventilatory failure. In this study, all the patients clinically diagnosed as a case of Guillain - Barre Syndrome (GBS) admitted in DMCH between January 2002 to December 2006, were analysed to evaluate the prognostic value and to understand the morbidity and mortality associated with ICU care. Total 406 patients were admitted in DMCH in last 5 years, of which 167 (41.13%) needed ICU care, which was about 10.01% of total ICU admission. 112 patients (67.07%) improved and leave ICU with or without some residual effects like weakness of both legs, persistent tracheostomy, malnutrition etc. and 55 patients (32.93%) were expired. The age of the subjects treated in ICU were 0-10 years 28(16.76%), 11-20 years 49 (29.34%), 21- 30 years 38 (22.75%), 31-40 years 24 (14.37%), 41-50 years 18 (10.77%) and 50 years and above 13 (7.78%). The duration of ICU stay were 0-10 days 88 (55.69%), 11-20 days 22 (13.17%), 21-30 days 12 (7.18%), 31- 40 days 6 (3.59%), 41-50 days 9 (5.38%) and > 50days 30 (17.96%). 39 patients (23.35%) needed tracheostomy. 77 patients (46.10%) needed mechanical ventilation. The median duration of mechanical ventilation was 35 days. The patients were ventilated more than 30 days usually developed ventilator - associated pneumonia and / or sepsis, malnutrition etc. Complications were uncommon if ICU stay were less than 3 weeks. Only 4 patients had history of readmission for second attack between this period. Only 7 patients were treated with immunotherapy which did not produce significant extra benefit. No patient was managed with plasma exchange (PE).

INTRODUCTION:

Guillain-Barre Syndrome (GBS) is an acute monophasic, symmetrically progressive, peripheral neuropathy, with an annual incidence 1-2 per 100,000 populations[1]. Affecting all ages, 50-60% cases follow viral illness within the preceding months, upto 10% follow vaccination or surgery[1].

Guillain - Barre Syndrome (GBS) is characterised by sudden onset of skeletal muscle weakness or paralysis typically manifests initially in the legs and spreads cephaled over the ensuing days to involve skeletal muscle of the arms, trunks and face. Bulbar involvement most frequently manifests as bilateral facial paralysis. Difficulty in swallowing due to pharyngeal muscle weakness and impaired ventilation due to intercostal muscle paralysis are the serious serious symptoms[2]. Autonomic nervous system dysfunction is a prominent finding in patient with GBS.

The diagnosis of GBS is based on clinical signs & symptoms [3], supported by CSF study & a nerve conduction velocity (NCV) test[4]. After the first clinical manifestations of the disease, the symptoms can progress over the course of hours, days or weeks. Most people reach the stage of greatest weakness within the first two weeks after symptoms appear & by the third week of the illness 90% of all patients are at their weakest[4].

There is no known cure of GBS. However there are therapies that lessen the severity of the illness & accelerate the recovery in most patients. There are also a number of ways to treat the complications of the disease. Currently high dose immunoglobulin & plasma exchange (PE) are used. Since the disease may be complicated by respiratory paralysis and / or severe autonomic instability , it is recognized as a potential neurological emergency that may require intensive care management[5]. Respiratory is the most life threatening complication of GBS & 10 - 30% patients may required mechanical ventilation[5,6]. A higher mortality has been seen in few reports published in India[7,8]. We review here the morbidity

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as well as mortality of GBS admitted in intensive care unit (ICU) during the last 5 years between Jan. 2002 to Dec. 2006.

METHODS & MATERIALS:

It was a prospective study of patients of GBS admitted in DMCH who were noted & those were reffered to Intensive care unit (ICU) were managed as per protocol described herein. Diagnosis of GBS was established clinically & supported by data from laboratory whenever available. Age, sex, precipitating events, duration of weakness, baseline symptoms & co-morbid conditions were recorded for all patients. The ultimate outcome measure was hospital survival. Duration of mechanical ventilation & ventilator associated complications (if any) were also recorded.

The patients needed mechanical ventilation were ventilated using Puritan Bennett 7200 AE, T Bird, Bear 3, Bear 33, Servo 900 ventilators. The need of tracheal intubation & mechanical ventilation was determined by serial assessment of respiratory function by clinical examination (level of overall pt. comfort, frequency & depth of breathing, use of accessory muscles, presence of paradoxical respiration, single breath count & integrity of upper airway reflexes), arterial blood gas (ABG) data & chest radiography[9]. Initially, control mode ventilation (CMV) with tidal volumes of around l0ml/kg was used. Patients were quickly shifted to synchronized intermittent mandatory ventilation (SIMV) with pressure support after stabilization. An effort was made to maintain oxygen fraction in inspired air (Fi02) at <0.5, while maintaining adequate oxygenation (p02 >60 mm Hg). Adequate nutrition, asepsis, humidification of inspired air, and regular endotracheal toileting were ensured. Chest physiotherapy was applied to prevent atelectasis. Continuous monitoring of hemodynamic & respiratory (including ABG and respiratory mechanics) variables were ensured. Patients were frequently turned in bedd to prevent bed sores. Low dose heparin were administered subcutaneously to decrease risk of venous thrombosis. Immunotherapy with intravenous immunoglobulin (IVIG) was administered wherever feasible, in a dose of 400 mg/kg daily for 5 days[10].

Tracheostomy was performed in the second week of ICU stay for patients predicted to require prolonged mechanical ventilation[11]. Weaning was accomplished by gradual reduction in the SIMV rate & level of pressure support. A T-piece trial was given & patients were extubated if they had normal bulbar reflexes and did not show any worsening (as manifested by respiratory muscle fatigue on clinical examination and/ or carbon dioxide retention on ABG analysis) during this period.

Results:

During the study period 406 patients admitted to DMCH of which 167 patients were ref. to ICU which was about 10% of total ICU admission. 112 (67.07%) patient improved & 55 (32.93%) patient expired during this period. . The age of the subjects treated in ICU were 0-10 years 28(16.76%), 11-20 years 49 (29.34%), 21- 30 years 38 (22.75%), 31-40 years 24 (14.37%),41 50 years 18 (10.77%) and 50 years and above 13 (7.78%). The duration of ICU stay were 0-10 days 88 (55.69%), 11-20 days 22 (13.17%), 21-30 days 12 (7.18%), 31- 40 days 6 (3.59%), 41-50 days 9 (5.38%)and > 50days 30 (17.96%). 39 patients (23.35%) needed tracheostomy. 77 patients (46. 10%) needed mechanical ventilation.

Table-I

ICU statistics on GBS (2002 -2006)

Year	Total admission of GBSin DMCH	Total admissionin in ICU	% of admission of GBS in ICU
2002	84	35	41.66%
2003	70	32	45.71
2004	77	42	54.54%
2005	84	29	34.52%
2006	91	29	31.84%
Total	406	167	41.13%

Table- II

ICU statistics on GBS (2002 -2006)

Year	Total admission of patients In ICU	Improved (%)	Expired (%)
2002	425	183(43.06%)	242 56.94%)
2003	345	156(45.22%)	189 (56.94%)
2004	364	179(49.18%)	185 (56.94%)
2005	239	112(45.85%)	127 (53.14%)
2006	295	101(34.24%)	194 (65.76%)
Total	1668	731(43.82%)	937 (56.18%)

Table-III

ICU statistics on GBS (2002 -2006)

Year	Total admission of patients In ICU	Total admission Of GBS Patient	% of admission
2002	425	35	8.24%
2003	345	32	9.28%
2004	364	42	11.54%
2005	239	29	12.13%
2006	295	29	9.83%
Total	1668	167	10.01%

Table-IV

ICU statistics on GBS (2002 -2006)

Year	Total admission of GBS patient	Improved cases (%)	Expired cases (%)
2002	35	21(60%)	14(40%)
2003	32	18(56,25%)	14(43.75%)
2004	42	32(76.19%)	10(23.81%)
2005	29	20(68.96%)	9(31.04%)
2006	29	21(72.41%)	8(27.59%)
Total	167	112 (67.07%)	55(32.93%)

Table-V

Age Groups of GBS Patients in ICU (2002 -2006)

Age Years	Year					Total	%
	2002	2003	2004	2005	2006		
0- 10 yrs	10	6	10	1	1	28	16.76%
11- 20 yrs	11	11	1Z	8	7	49	29.31%
21 - 30 yrs	7	3	10	6	12	38	22.75%
31 - 40 yrs	4	5	4	6	5	24	14.37% ‘
41 - 50 yrs	4	4	4	5	1	18	10.77%
51 -above	2	3	2	3	3	13	7.78%

Table -VI

Duration of stay in ICU of GBS Patients (2002 -2006)

Days	Year					Total	%
	2002	2003	2004	2005	2006		
0-10 days	21	21	20	12	14	88	55.69%
11 - 20 days	5	3	7	2	5	22	13.17%
21 -30 days	2	1	5	4	0	12	7.18%
31 - 40 days	1	1	0		3	6	3.59%
41 - 50 days	1	1	2	3	2	9	5.38%
> 50 days	5	5	8	7	5	30	17.96%

Tracheostomy needed : 39 (23.35%) patients.
Mechanical Ventilation needed : 79 (46.10%) patients.
No patient was managed with Plasma Exchange (PE).

DISCUSSION:

Patients with severe forms of Guillain - Barre Syndrome (GBS) required intensive care. Specific treatment, catheterization and devices may increase morbidity in the intensive care unit (ICU). To understand the spectrum of morbidity associated with ICU care, R.D.

Henderson, FRACP, N.D. Lawn, FRACP et. al. studied 114 patients with GBS and found major morbidity occurred in 60% patients[12] which also corresponded with our study. Respiratory complications such as pneumonia and tracheobronchitis occurred in half of the patients and were linked to mechanical ventilation. Systemic infection occurred one fifth of patients and was more frequent with increasing durationa of ICU admission. In our study all patients were managed traditionaly except 7 (seven) patients who received / immunotherapy and no patient treated with plasma exchange(PE). Richard A.C. Hughes, Antony V. Swan, Jean - Claude Raphael et. al. found in one trial with 148 participants following PE with IVIg did not produce significant extra benefit[13]. Limited evidence from three open trials in children suggested that IVIg hastens recovery compared with supportive care alone[13]. Corticosteroids were also compred with placebo or supportive treatment in six trials with altogether 587 patients, inwhich there was significantly less improvement after 4 weeks with corticosteroid than wit out. Two large trial of intravenous methyl- prednisolon with altogether 467 patients found no significant difference between corticosteroid and placebo.

In our study, direct complications of treatment and invasive procedure occurred infrequently. We found that pulmonary morbidity predominates in patients with severe GBS admitted in the ICU. Aggarwal AN, Gupta D, Lal V. et. al. found in their study 10 - 30% patient required ventilatory support[14]. in comparison to our study,46% patient needed mechanical ventilation. Complications in critically ill patients with GBS are most often not related to the basic disease. Although autonomic instability can precipitate swings in blood pressure or arrhythmias, these can usually be successfully tackled in well - equipped ICU.

Deaths resulting from GBS are nowadays uncommon, because of advances in all the aspects of intensive care. Mortality rates vary widely, ranging from 1% - 18% in most reports from West[15]. Patients requiring mechanical ventilation may have higher mortality rates[3]. Amuch higher mortality rate has been reported from some Indian centers, possibly related to less than ideal intensive care facilities due to financial constraints, like our ICU, when compared to conditions in developed countries[7,8]. In the modem era, death in GBS usually results from pneumonia, sepsis, adult respiratory syndrome, and less frequently autonomic instability or pulmonary embolism; most of these patients are on ventilatory support[14]. Old age and associated co morbidities increase the risk. Judith M Spies, Kazim A Sheikh found upto 5% of patients did not survive inspite modern intensive care facilities[16]. But in our study mortality rate was 32% of which predominantly aged patient >50 years and

patients who developed autonomic involvement. Some patient also expired within 0-1 days without proper diagnosis of GBS, which were may be some other neurological defects like encephalitis, TB meningitis or space occupying lesion (SOL).

CONCLUSION:

In conclusion, ventilatory failure in severe GBS often requires prolonged respiratory support and ICU care. Mechanical ventilation itself is not difficult in these patients with normal lung mechanics and gas exchange. Most patients have a favourable outcome. Mortality is usually related to systemic problems or complications of hospitalization, rather than the basic disease. Further research is needed to identify better treatment regimens and new therapeutic strategies.

REFERENCES:

1. Tentis SM, Hirsch NP, Smith GB, Guillain - Barre Syndrome; Anaesthesia & intensive Care A-Z; 2nd ed; 2000; Page 239-240.
2. Robert K. Stoelting, Dierdorf F. Guillain - Barre Syndrome; Anaesthesia & Co-Existing Disease; 4th ed; 2002; 274-5.
3. Ropper AH, The Guillain - Barre Syndrome. N Eng J Med 1992; 326; 1130-6.
4. Guillain - Barre fact sheet. National institute of nurologycal disorder and stroke;page 1-4 http://www.ninds.ni.gov/disorders/gbs/detailgbs.htm?=print.
5. BellaI, Chad DA; Neuromuscular disorders and acute respiratory failure; Neurology clinics. 998; 16; 391-417.
6. Gracey DR, Mc Michan JC, Diverte MB, Howard FM; Respiratory failure in Guillain - Barre Syndrome; A 6 year experience, Mayo clinic proceedings 1982; 57; 742-6.
7. Abhyankar NY, Bhambhure NM, Kasekar IG et. al. Intensive respiratory care; Our eight year experience; Indian J Chest Dis- Allied Sci 1992; 34; 65-72.
8. Gnanamuthee C, Ray D, Outcome of patients with Guillain - Barre Syndrome on mechanical ventilatory support, Indian J Chest Dis- Allied Sci 1995; 37; 63-9.
9. Hund EF, Borel CO, Cornblath DR, Hadley DF, MC Khann GM; Intensive management and treatment of severe Guillain - Barre Syndrome; Crit care Med. 1993; 21: 433-46.
10. Plasma exchange/ Sandoglobulin Guillain - Barre Syndrome Trial Group; Randomized trial of plasma exchange, intravenous immunoglobulin, and combined treatments in Guillain - Barre Syndrome; Lancet 1997; 349: 225-30.
11. Plummer AL, Gracey DL, Consensus conference on artificial airways in patients receiving mechanical ventilation. Chest 1989; 96: 178-80.
12. R.D. Henderson, FRACP, N.D. Lawn, FRACP, D.D. Fletcher, MD et.al.; The morbidity of Guillain - Barre Syndrome admitted to the intensive care unit; Neurology 2003; 60: 17-21.
13. Richard AC, Hughes, Antony V. Swan, Jean - Claude Raphael et. Al. Immunotherapy for Guillain - Barre Syndrome : a systemic review; Brain 2007; 130(9): 2245-2257.
14. Aggarwal AN, Gupta D, Lal V et. al; Ventilatory management of respiratory failure in patients with severe Guillain - Barre Syndrome; Neurology India; 2003, 51(2): 203-205.
15. Fulghan JR, Wijdicks EFM, Guillain – Barre Syndrome; Crit Care Clin 1997; 13: 1-15
16. Judith M Spies, Kazim Asheikh, management of Guillain – Barre Syndrome; Summary Expert Review of Neurotherapeutics, September 2001, 1 (1): 119:129;