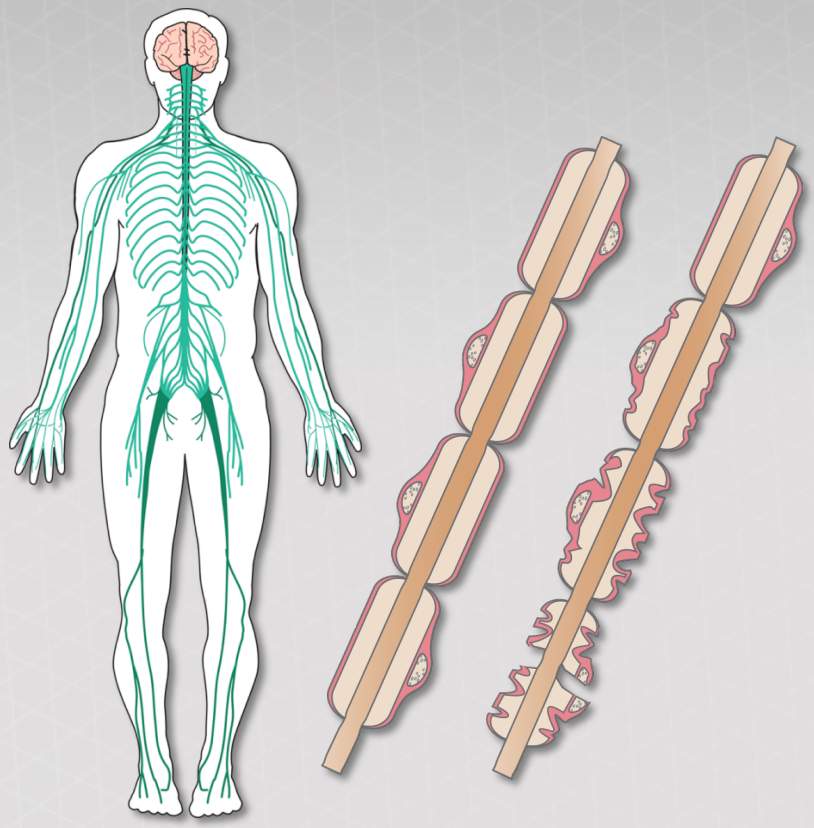
PolyNeuro exchange

Overview and Treatment of Guillain-Barré Syndrome (GBS)

Description of GBS



- GBS is an acute, immune-mediated polyneuropathy.
- GSB is the most common cause of acute, non-traumatic neuromuscular paralysis worldwide, with an estimated annual incidence of about 2 per 100,000 people.[1-3]
- GBS affects all ages, ethnicities and genders.
- GBS is more common in men and the elderly.[3]

GBS: Guillain-Barré Syndrome

1. Hughes RA, *et al*. Lancet 2005;366:1653–1666
2. v. Doorn PA, *et al*. Lancet Neurol 2008;7:939–950
3. Shui IM, *et al.* Neuroepidemiol 2012;39:109-115

GBS

General features

- Acute onset with maximal disability reached within 4 weeks of onset for 90% of patients.[1]
- Majority of patients report an antecedent event 28 days before onset; commonly upper respiratory tract infection or *Campylobacter jejuni* infection.[1-3]

Symptoms, signs and tests

- Bilateral and symmetrical loss of sensation and weakness which usually begins in feet and spreads upward and may lead to difficulty in breathing.
- Reflexes are lost.
- Spinal fluid protein is frequently elevated.
- Nerve conduction studies show a neuropathy.

GBS: Guillain-Barré Syndrome

1. Hughes RA, *et al*. Lancet 2005;366:1653–1666
2. Yuki N. J Clin Med 2004;66:1205–1210
3. Kuwabara S, *et al*. Neurology 2004;63:529–33

Prognosis of GBS

- GBS is a monophasic, self-limiting disease, that worsens over 2-4 weeks and then starts to improve.
- Strong evidence shows that treatment with either IVIg or Plasma exchange (PE) improves recovery and outcome[1].
- Recovery period varies and may take weeks to years.
- Recovery is affected by age, antecedent gastroenteritis, speed of onset, maximal disability and nerve conduction evidence of axon loss.[2,3]
- Erasmus GBS Outcome Scale can be used to select GBS patients at risk for a poor prognosis.[2]
- Approximately 5% of GBS patients die and up to 20% have persistent disability, despite immunotherapy.[4]

1. Guideline Source: http://www.aan.com/professionals/practice/pdfs/gbs_guide_aan_mem.pdf
2. v. Doorn PA, *et al*. J Clin Immunol 2010;30(Suppl1):74-78
3. The Italian Guillain-Barré Study group. Brain 1996;119:2053-61
4. Yuki N, Hartung H-P. NEJM 2012;366:2294-2304

Diagnosis of GBS

Diagnostic criteria[1,2]	Manifestation
Clinical features essential for diagnosis	• Progressive weakness in arms and legs • Areflexia • Maximum weakness reached within 4 weeks
Clinical features supporting diagnosis	• Relatively symmetrical, progressive over days to four weeks • Autonomic features • Cranial nerve involvement • Absence of fever
Clinical features not supporting diagnosis	• Significant asymmetry • Early and persistent bowel or bladder disturbance
Differential diagnoses	• Toxic neuropathies • Hereditary neuropathies (e.g. porphyria) • Inflammatory diseases (e.g. collagen vascular disease, Lyme disease) • Metabolic neuropathies (e.g. diabetes mellitus) • Carcinomatous meningitis • Other such as transverse myelitis, myasthenic crisis, acute rhabdomyolysis
CSF and electrodiagnostic findings	• Elevated protein with normal cell count (albumino-cytologic dissociation) • Electrodiagnostic studies showing a neuropathy

CSF: cerebrospinal fluid

1. Meena AK, *et al*. Ann Indian Acad Neurol 2011;14(Supp1):S73–S81
2. Asbury AK, Cornblath DR. Ann Neurol 1990;27:S21-24

Treatment options for GBS

- Plasma exchange (PE) and IVIG are effective in the treatment of GBS.[1,2]
  - PE: usually administered as one plasma volume, 50 mL/kg on five separate occasions over 1-2 weeks.
  - IVIG: total dose of 2g/kg delivered over 5 days or 0.4 g/kg/day x 5 days.
- Attentive and supportive care reduce morbidity and mortality.[1,3]
  - Mechanical ventilation for respiratory paralysis.
  - Monitoring for hypertension, postural hypotension and cardiac arrhythmia.
  - Opioid analogs / other drugs for pain and sensory symptoms.
  - Subcutaneous heparin and support stockings for DVT risk.
- Emotional support and rehabilitation.

DVT: deep vein thrombosis, GBS: Guillain-Barré Syndrome, IVIG: intravenous immunoglobulin

1. Meena AK, *et al*. Ann Indian Acad Neurol 2011;14(Supp1):S73–S81
2. Van der Meché FG, Schmitz PI. NEJM 1992;326(17):1123-1129
3. Hughes RA, *et al.* Arch Neurol 2005;62:1194-1198

Outcome measures for GBS

- Outcome measures typically assess the following functions:

Motor:
- GBS disability score
- MRC sum score
- FIM Motor Scale
- Hand function tests
- Walking tests

Sensory:
- Visual Analog Pain Scale
- McGill Pain Questionnaire-Short Form
- Romberg's test
- Pinprick, light touch and vibration perception tests

Duration:
- Length of ICU or hospital stay
- Duration of mechanical ventilation (if applicable)

Other:
- IgG serum levels
- Erasmus GBS Outcome Scale

FIM: Functional Independence Measure, GBS: Guillain-Barré Syndrome, ICU: intensive care unit
IgG: immunoglobulin G, MRC: Medical Research Council

International Guillain-Barré Syndrome Outcome Study (IGOS)[1]

- IGOS is a worldwide prospective study being conducted by the Inflammatory Neuropathy Consortium of the Peripheral Nerve Society.
- Aim: To define biomarkers for disease activity and recovery and to develop prognostic models to predict the clinical course and outcome in individual patients with GBS.
- Study design: A prospective, observational multicenter study, including at least 1000 patients, with a follow-up period of at least one year.
- Expected results: a standardized clinical database and biobank with up to 3-year patient follow-up.
- These data will be available for researchers to determine processes of disease progression and recovery in GBS, to develop prognostic models, conduct selective therapeutic trials, and personalize treatment.

GBS: Guillain-Barré Syndrome, IGOS: International Guillain-Barré Syndrome Outcome Study

1. International GBS Outcome Study. https://www.gbsstudies.org/about-igos Accessed February 2013

Additional thoughts on GBS

- There is still a need for improved treatment options in GBS:
  - Up to 5% of patients with GBS die and ~15% are unable to walk after one year.
- A study of a second IVIG infusion in those with a poor prognosis is underway.
  - Anecdotal reports suggest that in some patients a 2nd IVIg dose may be beneficial.
  - One study suggests that patients with higher increments of IgG levels have better outcomes.[1]
- Research on supplementary therapies that might protect the axon and/or promote the axonal regeneration are underway.

1. Kuitwaard K, *et al*. Ann Neurol 2009;66:597-603