From droopy eyelids to a near complete shutdown

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Case presentation

- 48 year old male patient presenting with weakness 4 limbs for 3 days.
- No significant past medical history.
- Patient’s sister died at the age of 50 years of myasthenia crisis.
- The patient had 3 months ago meningitis ACYW135 vaccine before going abroad. The trip was uneventful.
- He had received one week prior to his admission 3-day course azithromycin for a chest infection.

Clinical findings

- Neurological examination showed a flaccid distal quadriparesis with hyporeflexia.
- Absence of sensory deficit.
- The quadriparesis rapidly progressed over 24 hours with bilateral ptosis and respiratory failure for which the patient had to be intubated and put on ventilator support.

Initial biological findings

- Full blood count, urea, electrolytes and serum creatinine were normal
- CRP was less than 10 mg/dl and ESR 25 mm first H.
- Creatine kinase was within normal range (52 UI/l)
- Lumbar puncture showed no cellularity and a normal protein level of 40 mg/dl. Culture was negative.

Imaging studies

- Chest xray normal
- MRI brain showed features of bilateral maxillary sinusitis with no evidence of neither space occupying lesion nor focal inflammatory nor vascular CNS lesion.

Initial management

- The patient had a full course of intravenous immunoglobulins 2g/kg over 5 days together with 1 mg/kg/day methylprednisone.
- Ventilator support and ICU care.

Initial outcome

- No response to initial therapy:
  - Worsening of the flaccid quadriparesis
  - No improvement of the ptosis and onset of bilateral mydriasis
  - Continued need for ventilator support

Working diagnosis???

- Guillan Barré syndrome.
- Myasthenia Crisis.
- Dermatomyositis (CK level was normal, absence of caracteristic skin lesion, no features of ILD on chest imaging).
- MS (flaccid paralysis, no MRI white matter lesion).
- Vasculitis with acute polyneuropathy (normal inflammatory markers, no purpura, normal renal function and absence of hematuria).

? Myasthenia gravis vs Guillan Barré syndrome

- Family history of myasthenia gravis.
- Patient had a course of azithromycin which can exacerbate myasthenia.
- Tensilon test was negative and the patient did not respond to mestinon.
- Initial LP was normal.
- Nerve conduction studies could not be carried out initially.

What to do next?

- The patient was started on therapeutic plasma exchange using a membranous technique.

Therapeutic plasma exchange

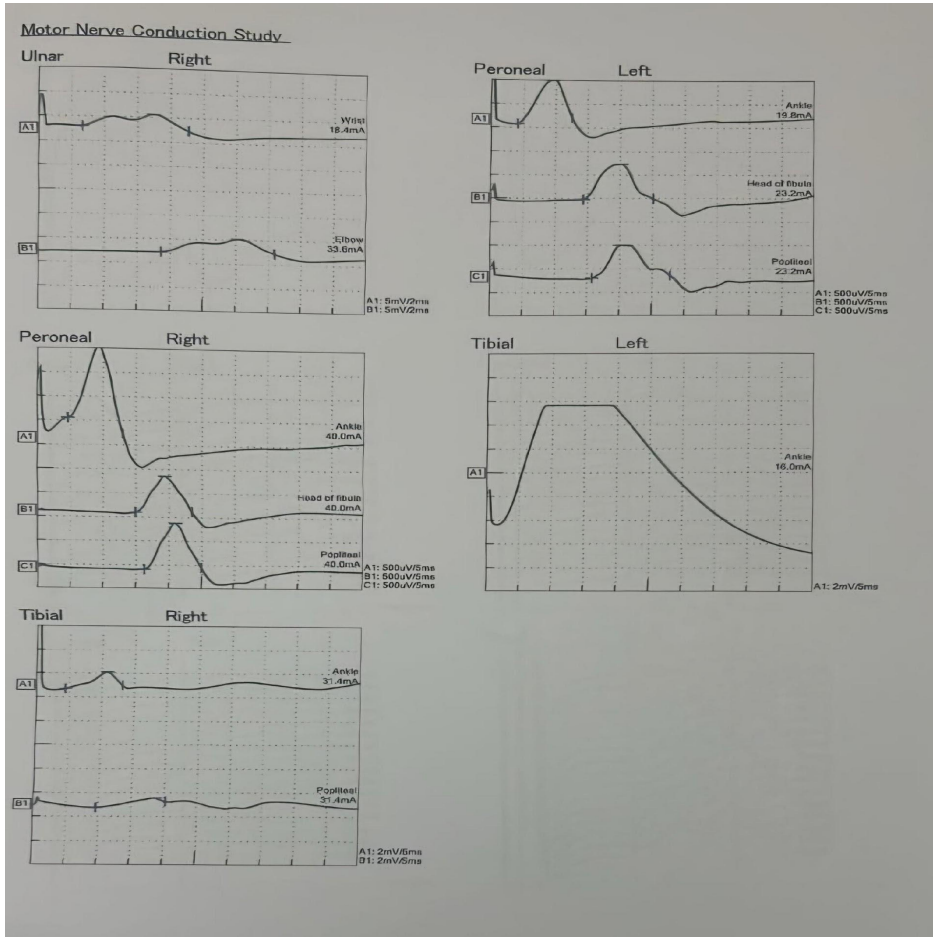
Back to our patient

- A repeat LP showed an increase in CSF proteins (180 mg/dl) with albuminocytologic dissociation.
- Acetylcholin receptor and MUSK antibodies were negative.

Back to our patient

- Clinical improvement after the first session of plasma exchange.
- TPE was stopped after 4 sessions because of an infected HD catheter, which was treated with broad spectrum antibiotics.
- The patient recovered power in all 4 limbs, had ventilator support gradually weaned off and was extubated 14 days following TPE.
- Nerve conduction studies done confirmed the diagnosis of Guillain Barré Syndrome.

NCS results



Remarks

Upper and lower extremities motor conduction studies CMAP elicited, with reduced amplitudes, d.latencies and conduction velocitied normal. Delayed responses F-waves and H-reflexes non-elicited. Sensory SNAP of tested sensory nerves elicited. Repetitive Nerve stimulation of facial nerve/Peroneal no significant decrement appreciated. Needle EMG: Tested muscles fibrillations noted with activation and recruitment borderline.

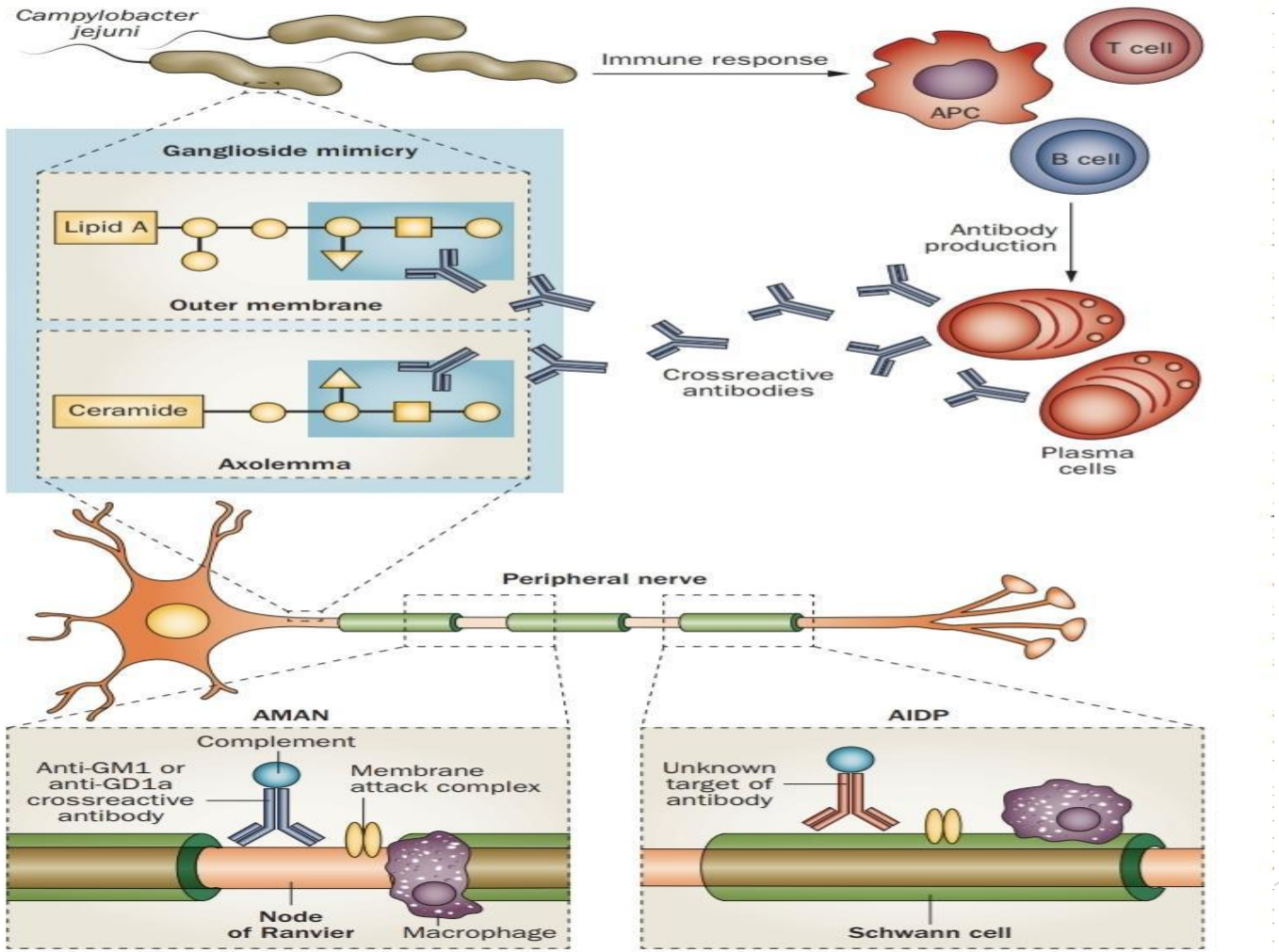
Impression: Electrodiagnostic findings highly supportive of a generalised distal and proximal axonal polyneuropathy suggestive of AMAN type GBS. To correlate clinically.

Pictures from Dr A Currimbuccus and Dr H Hurbungs

Guillan Barré Syndrome

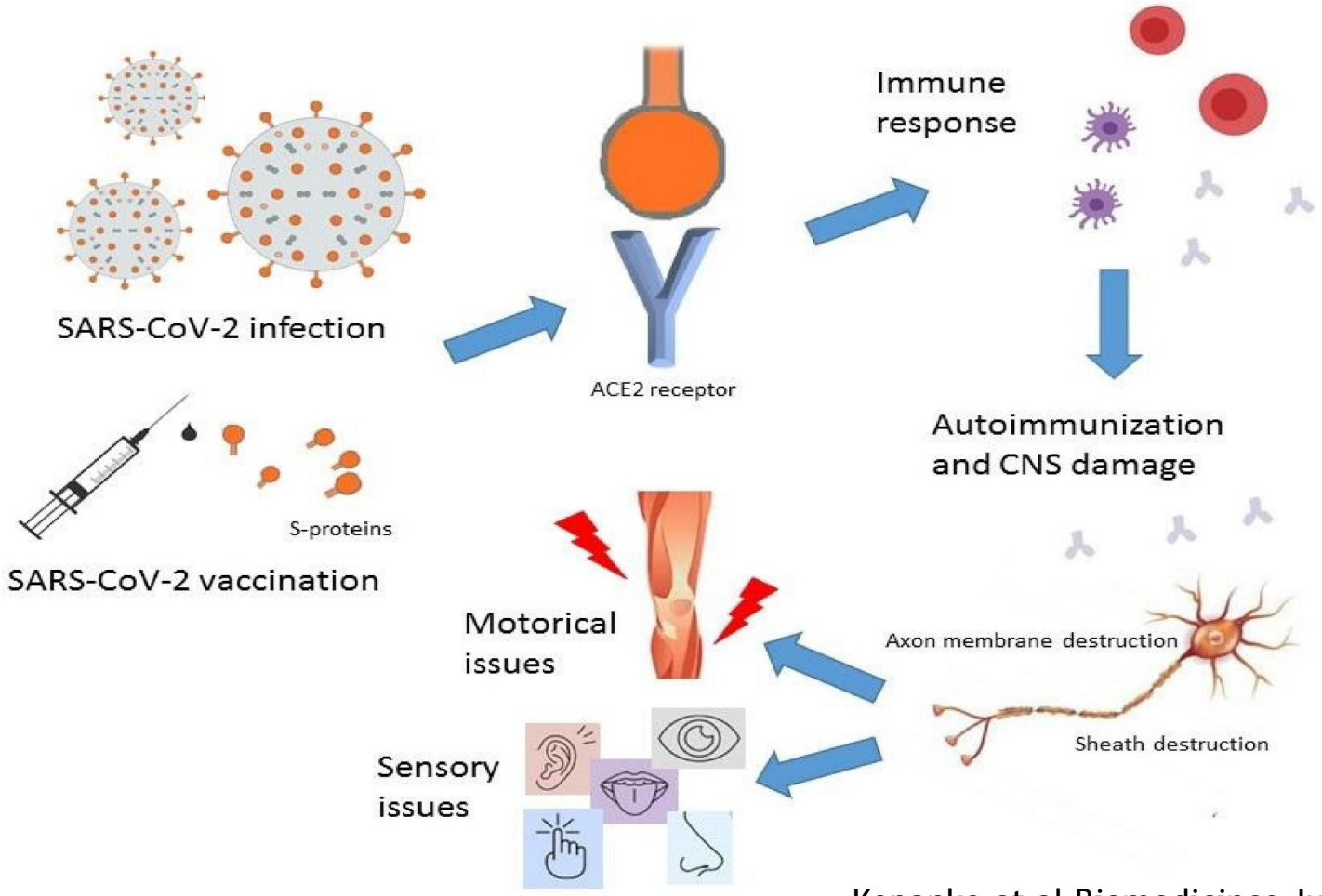
- Acute immune mediated (against gangliosides) polyradiculoneuropathy.
- Nerve cells demyelination and/or axonal damage.
- One of the most common causes of acute acquired bilateral flaccid muscle weakness.
- Often preceded by a triggering event (infection, vaccine,…)
- Diagnosis is usually based on clinical, CSF and electrophysiological findings.
- Management is multidisciplinary with:
  - Intravenous immunoglobulins/plasma exchange
  - ICU care +/- ventilator support
  - Physiotherapy

Guillan Barré Syndrome



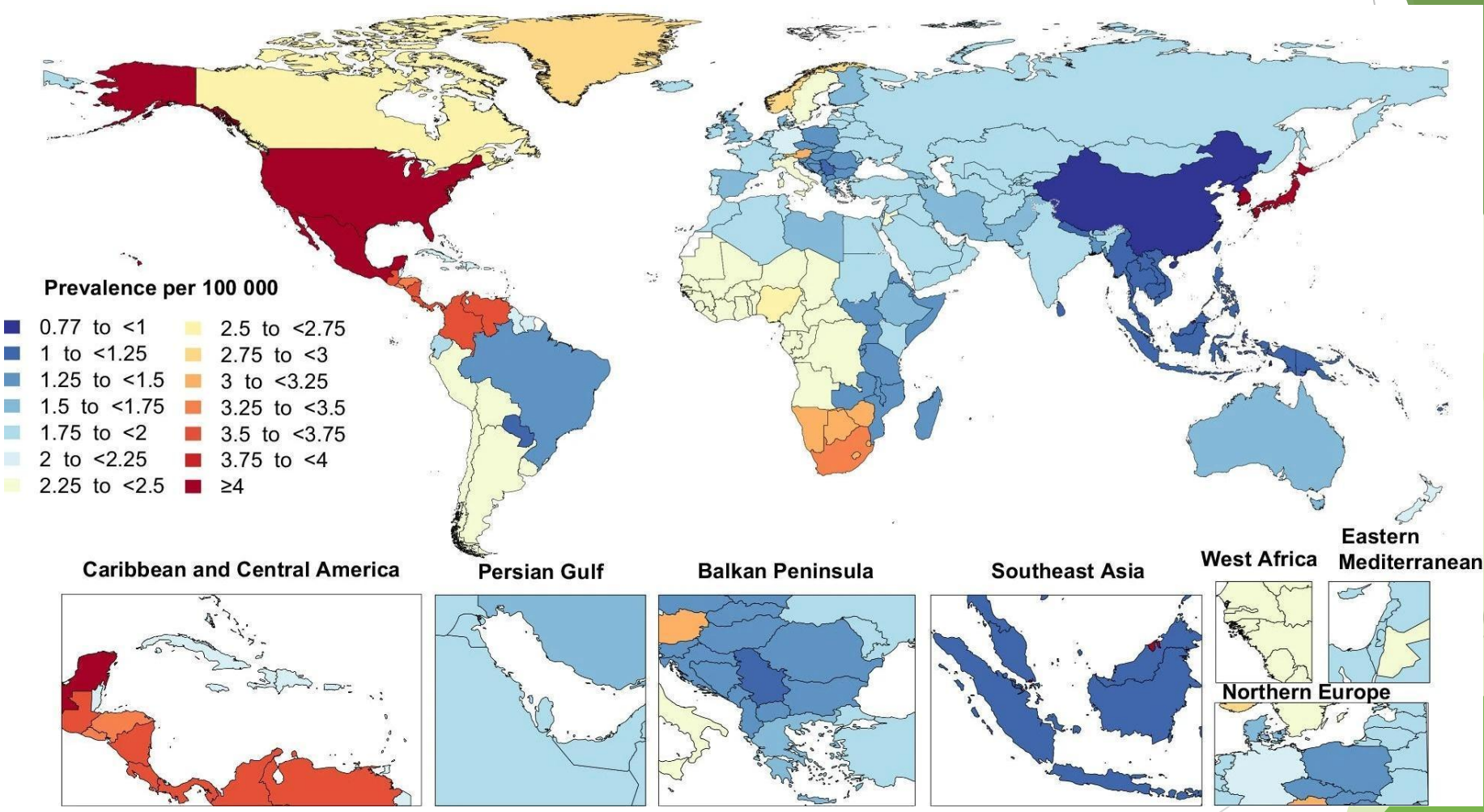
Van den Berg, B. et al. Nat. Rev. Neurol. 10, 469–482 (2014)

Guillan Barré Syndrome



Kopanko et al Biomedicines June 2024

Guillan Barré Syndrome



Bragazzi et al, Journal of Neuroinflammation, 2021

Guillan Barré Syndrome

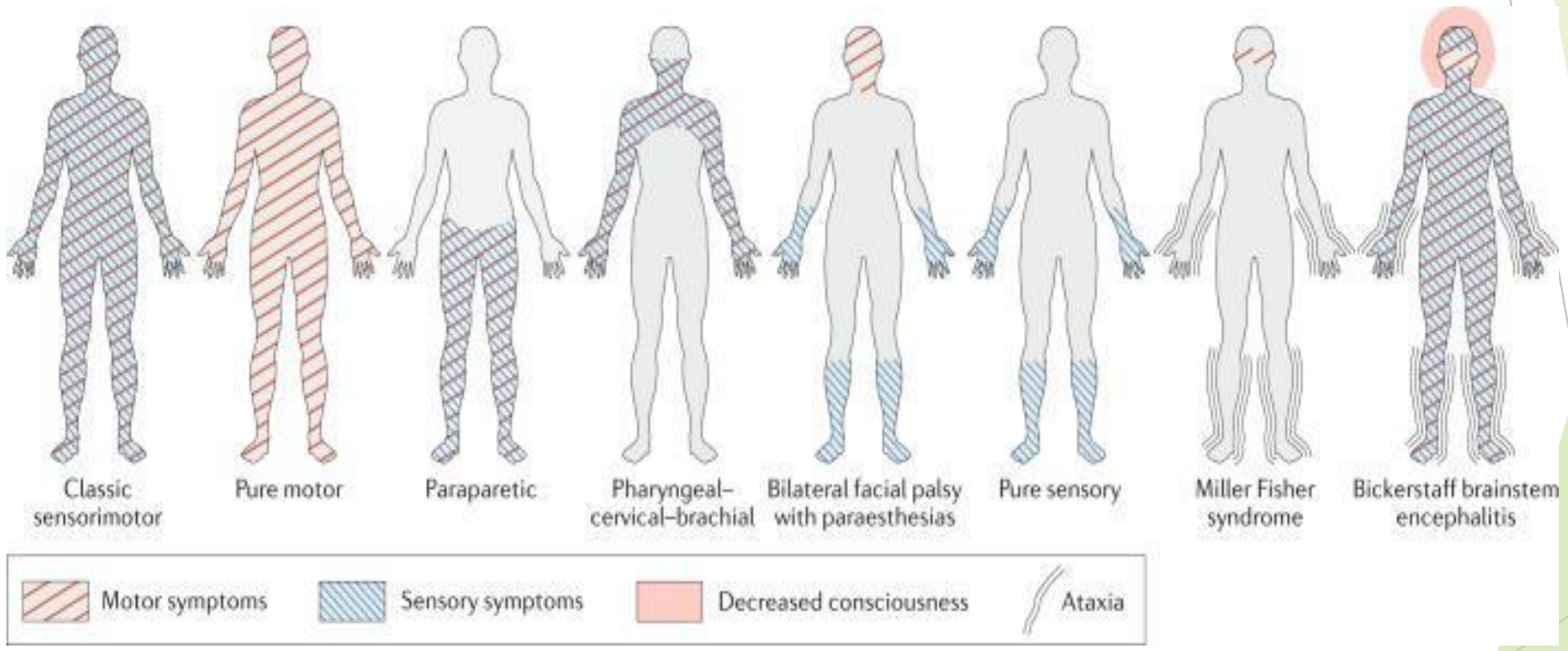
Table 1 | GBS subtypes, clinical features and relevant antibodies[3,37,43]

GBS subtypes	Main clinical features	NCS findings	Antibodies*
Acute inflammatory demyelinating polyneuropathy (AIDP)	Sensorimotor GBS, often combined with cranial nerve deficits and frequent autonomic dysfunction	Demyelinating polyneuropathy	Various‡
Acute motor axonal neuropathy (AMAN)	Pure motor GBS; cranial nerves rarely affected	Axonal polyneuropathy, sensory action potential normal	GM1a, GM1b GD1a GalNAc-GD1a
Acute motor sensory axonal neuropathy (AMSAN)	Resembles severe AMAN, but sensory fibres are affected, leading to sensory deficits	Axonal polyneuropathy, sensory action potential reduced or absent	GM1, GD1a
Pharyngeal–cervical brachial variant	Prominent weakness of oropharyngeal, facial, neck and shoulder muscles	Normal in most patients, sometimes abnormalities in arms, mostly axonal pattern	GT1a>GQ1b >>GD1a
Miller Fisher syndrome	Ataxia, ophthalmoplegia, areflexia	Normal in most patients; 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.

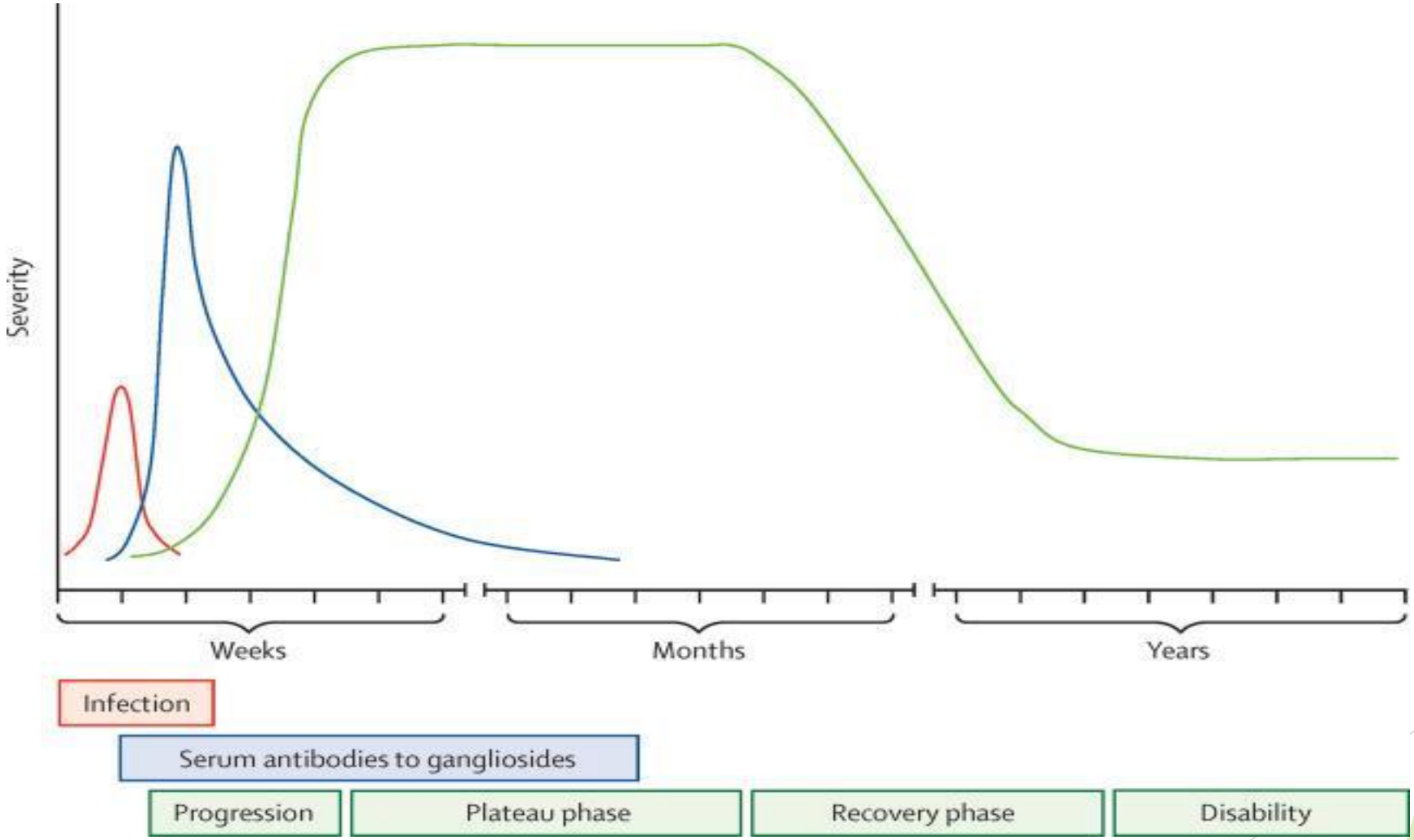
Van den Berg, B. et al. Nat. Rev. Neurol. 10, 469–482 (2014)

Guillan Barré Syndrome



Leonhard et al Nat Rev Neurol. 2019

Guillan Barré Syndrome



Hugh et al Lancet Feb 2016

Guillan Barré Syndrome

Box 1 | **Diagnostic criteria for Guillain–Barré syndrome**

This box lists the diagnostic criteria for Guillain–Barré syndrome (GBS) developed by the National Institute of Neurological Disorders and Stroke (NINDS)[3] and subsequently modified in a review paper[6]. We have added some features that cast doubt on the diagnosis, which were not mentioned in the original criteria[2,3,6], and have made some adaptations to improve readability. These criteria are not applicable to some of the specific variants of GBS, as described in TABLE 1.

Features required for diagnosis

- Progressive bilateral weakness of arms and legs (initially only legs may be involved)[a]
- Absent or decreased tendon reflexes in affected limbs (at some point in clinical course)[a]

Features that strongly support diagnosis

- Progressive phase lasts from days to 4 weeks (usually <2 weeks)
- Relative symmetry of symptoms and signs
- Relatively mild sensory symptoms and signs (absent in pure motor variant)[a]
- Cranial nerve involvement, especially bilateral facial palsy[a]
- Autonomic dysfunction
- Muscular or radicular back or limb pain[b]
- Increased protein level in cerebrospinal fluid (CSF); normal protein levels do not rule out the diagnosis[b]
- Electrodiagnostic features of motor or sensorimotor neuropathy (normal electrophysiology in the early stages does not rule out the diagnosis)[b]

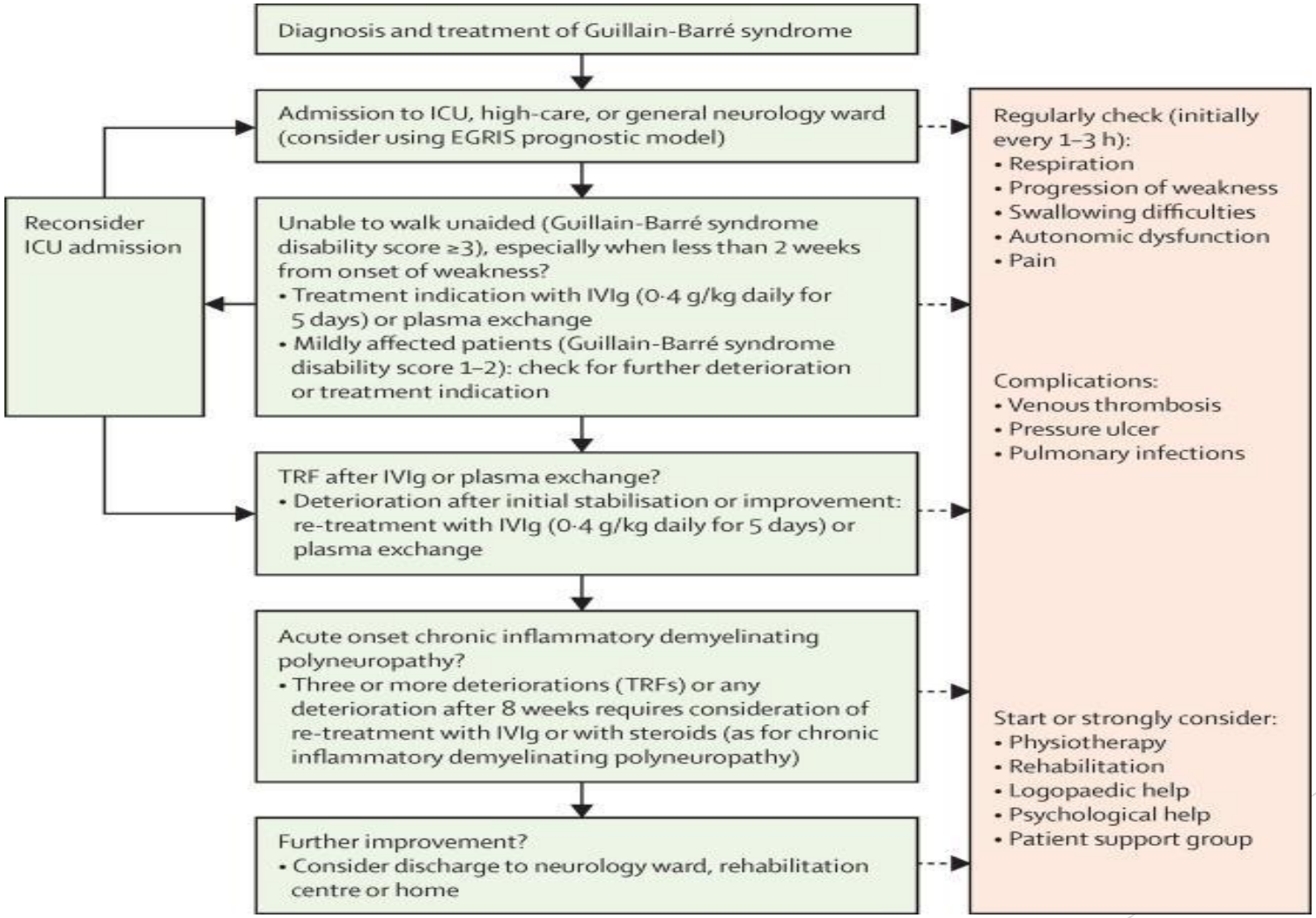
Features that cast doubt on diagnosis

- Increased numbers of mononuclear or polymorphonuclear cells in CSF ($>50 \times 10^6$/l)
- Marked, persistent asymmetry of weakness
- Bladder or bowel dysfunction at onset or persistent during disease course[b]
- Severe respiratory dysfunction with limited limb weakness at onset[b]
- Sensory signs with limited weakness at onset[a]
- Fever at onset
- Nadir <24 h[b]
- Sharp sensory level indicating spinal cord injury[a]
- Hyper-reflexia or clonus[b]
- Extensor plantar responses[b]
- Abdominal pain[b]
- Slow progression with limited weakness without respiratory involvement
- Continued progression for >4 weeks after start of symptoms[b]
- Alteration of consciousness (except in Bickerstaff brainstem encephalitis)[b]

Minor adaptations were made by the authors to a simplified version of the original NINDS criteria[6]. [a]Statements in NINDS criteria that were adapted by authors to improve readability. [b]Additional features which were not included in the NINDS. Note: for clarity, we have omitted 'Features that rule out the diagnosis' from the original NINDS criteria for this adapted version.

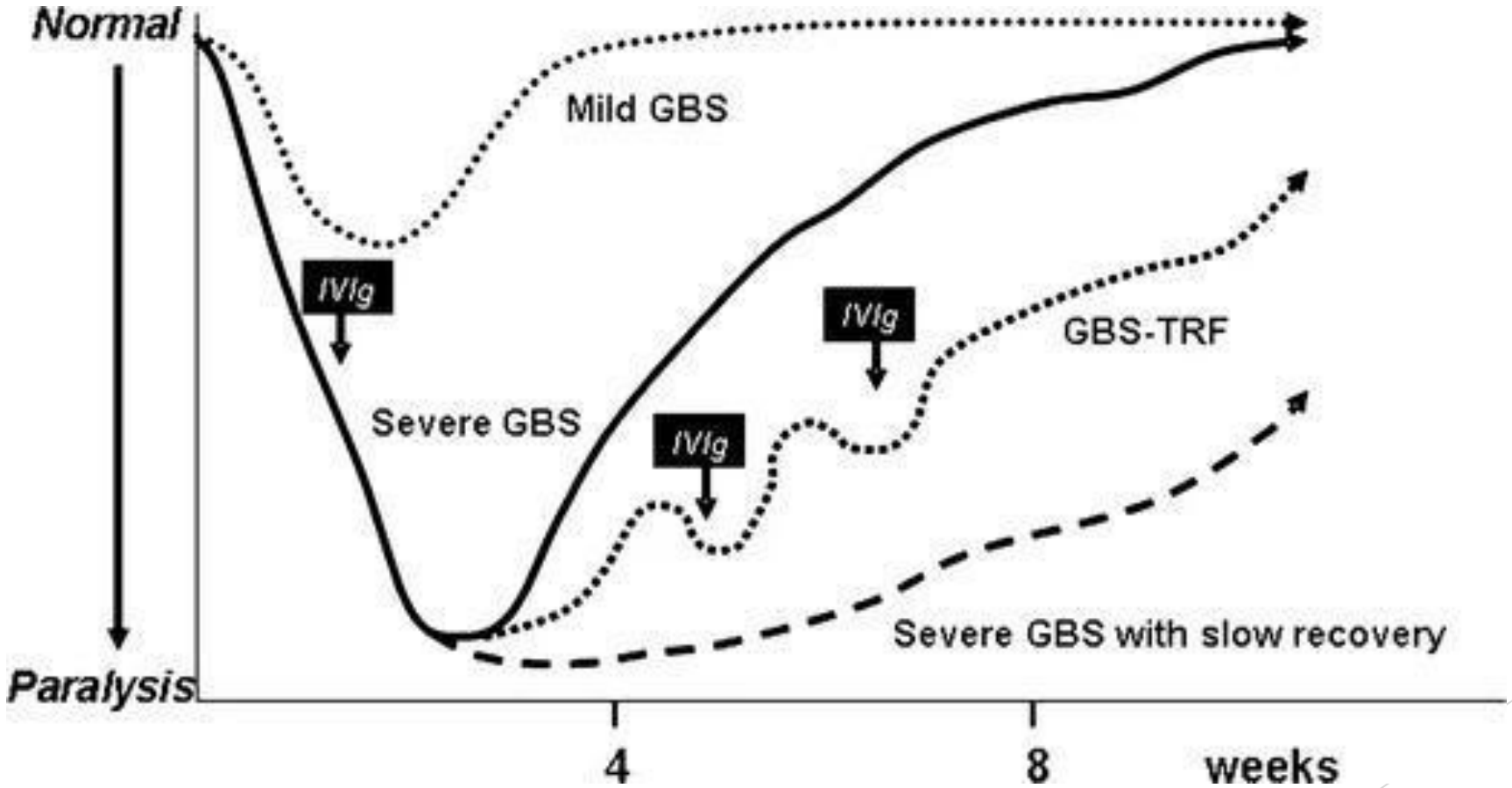
Leonhard et al Nat Rev Neurol. 2019

Guillan Barré Syndrome



Hugh et al, Lancet Feb 2016

Guillan Barré Syndrome



Pieter et al Journal of Clin Imm April 2010

Guillan Barré Syndrome

Authors	Age range	Number	Ventilated (%)	Mortality (%)	Recovery (%)
Paradiso *et al*[5]	14 mo-14 yr	61	13.1*	NA	82% (14-270 days)
Korinthenberg *et al*[7]	11 mo-17.7 yr	155	16	NA	92.4% (≥6 mo)
Rantala *et al*[9]	0.4-14.3 yrs	27	18.5	0	NA
Briscoe *et al*[10]	19 mo- 13 yr	23	4.3	4	NA
Kleyweg *et al*[25]	1-14 yrs	18	22	11.1	77% (Gr0/1 at 1 year)
Rees *et al*[15]	5-85 yrs	69	25	8.7	NA
Beghi *et al*[8]	3-87 yrs	297	14	11 (1 year)	70%
study	1-15 yrs	52	19.2	11.5	Present 87.5 %(Gr 0/1 at 1 yr)

*Data on respiratory failure, NA- Not available

Kalra et al Indian Journal of Paediatrics May 2009

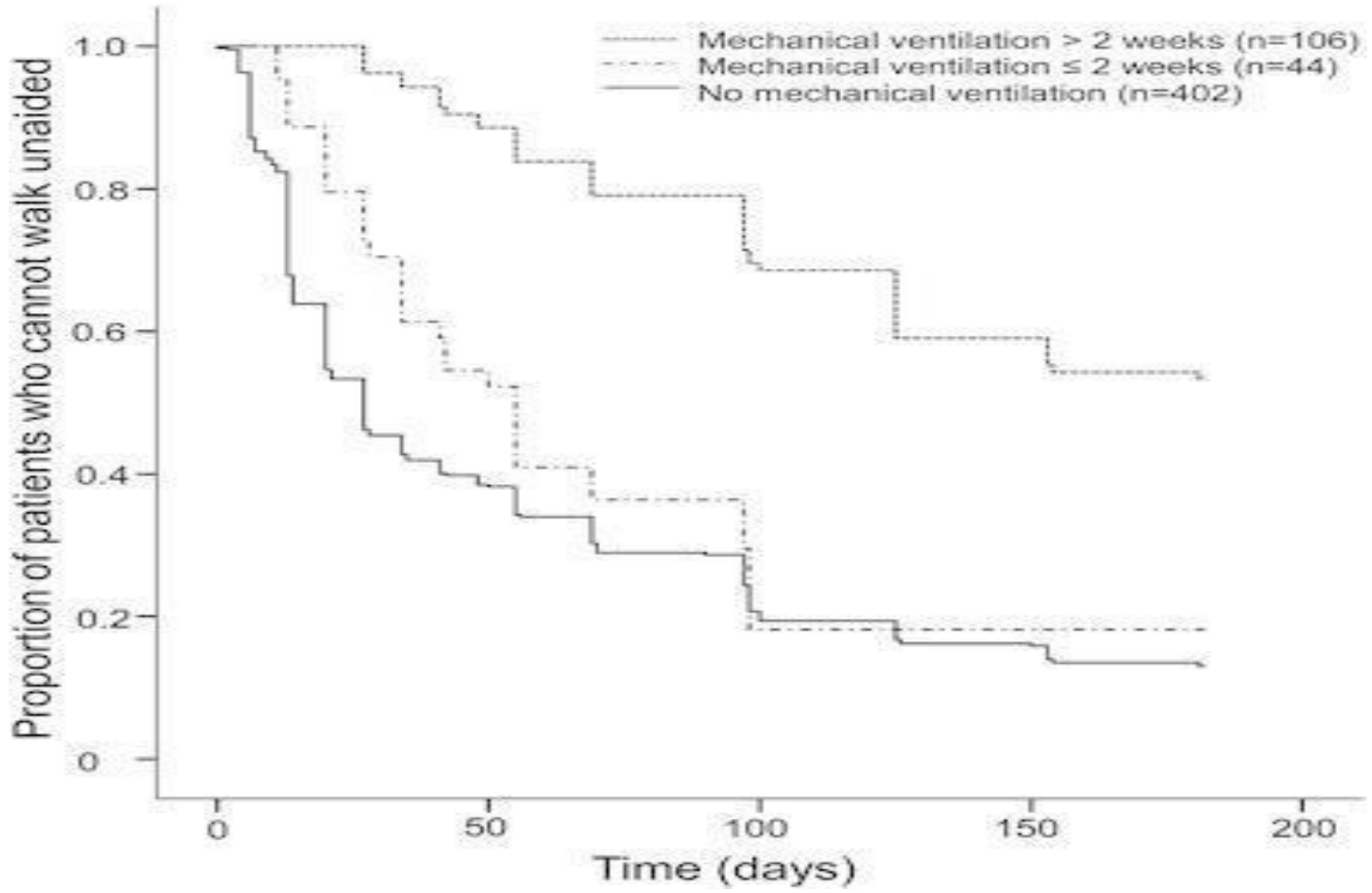
Guillan Barré Syndrome

Table 4 Predictors for in-hospital mortality in Guillain-Barré syndrome; outcome: in-hospital mortality

Effect: in-hospital mortality	Odds ratio	95% CI
Age, y		
50–75 vs >50	4.04	2.20-7.41
75+ vs >50	10.8	5.79-20.26
No. of procedures performed	2.26	1.38-3.71
>2 vs ≤ 2		
Charlson Comorbidity Index		
Moderate vs mild	1.58	0.99-2.51
Severe vs mild	4.3	1.55-12.0
Complications, yes vs no		
Cardiac	3.50	2.15-5.71
Systemic infection	3.64	1.40-9.50
Endotracheal intubation	5.09	3.21-8.05

Alsheklee et al, Neurology April 2008

Guillan Barré Syndrome



Walgaard et al Neurocritical care August 2016

Lessons learned

- Diagnosis of Guillain Barre syndrome can be challenging in real life.
- A multidisciplinary team effort is important for the management of GBS.
- Therapeutic plasma exchange was used for the first time in Mauritius using a membrane based technique.
- TPE is an important therapeutic tool in our arsenal to manage several conditions including GBS.
- Special precaution has taken to prevent ICU related complications, which can be one of the main causes of mortality and morbidity among GBS patients.

THANK YOU