Gloucestershire Hospitals NHS
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UNIVERSITY OF OXFORD
NUFFIELD DEPARTMENT OF CLINICAL NEUROSCIENCES
Medical Sciences Division

Guillain-Barré syndrome and related disorders

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Gloucestershire Royal Hospital

Disclosures

Novartis - educational grant

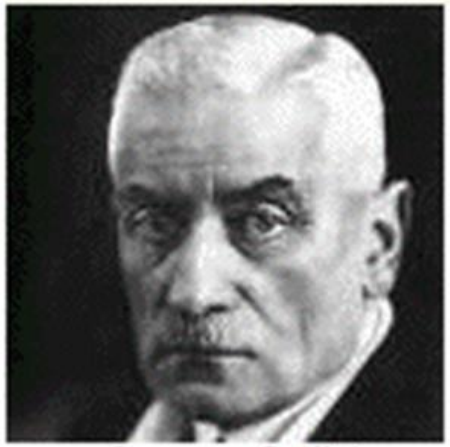
Guillain-Barré syndrome and related disorders

- What is Guillain-Barré syndrome?
- The GBS spectrum
- Making a diagnosis
- Early management

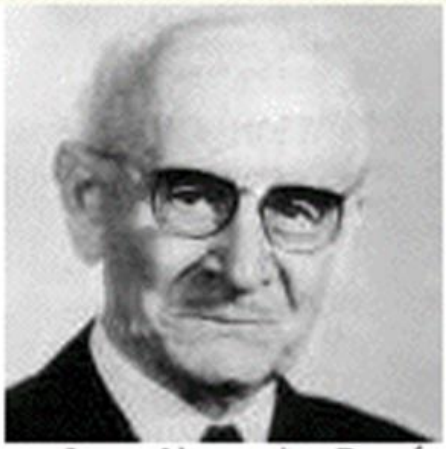
Guillain-Barré syndrome (GBS)

SUR UN SYNDROME DE RADICULO-NÉVRITE AVEC HYPERALBUMINOSE DU LIQUIDE CÉPHALO-RACHIDIEN SANS RÉACTION CELLULAIRE. REMARQUES SUR LES CARACTÈRES CLINIQUES ET GRAPHIQUES DES RÉFLEXES TENDINEUX,

par MM. GEORGES GUILLAIN, J.-A. BARRÉ et A. STROHL.



Georges Guillain

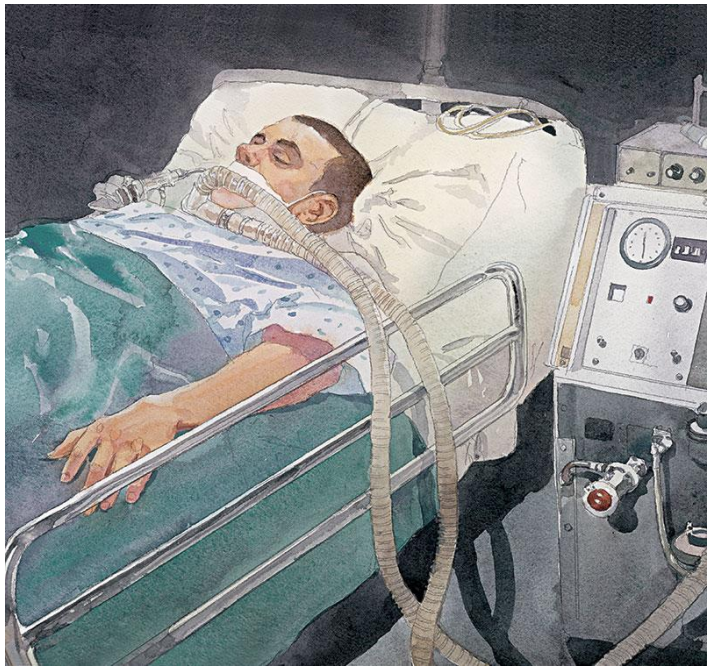


Jean-Alexandre Barré

André Strohl

Guillain-Barré syndrome (GBS)

- Commonest cause of acute flaccid paralysis
- Incidence 1.1 per 100,000
- male x 1.8
- 20% severely disabled, 5% die



Miller Fisher syndrome (MFS)

The New England
Journal of Medicine

Volume 255 JULY 12, 1956 Number 2

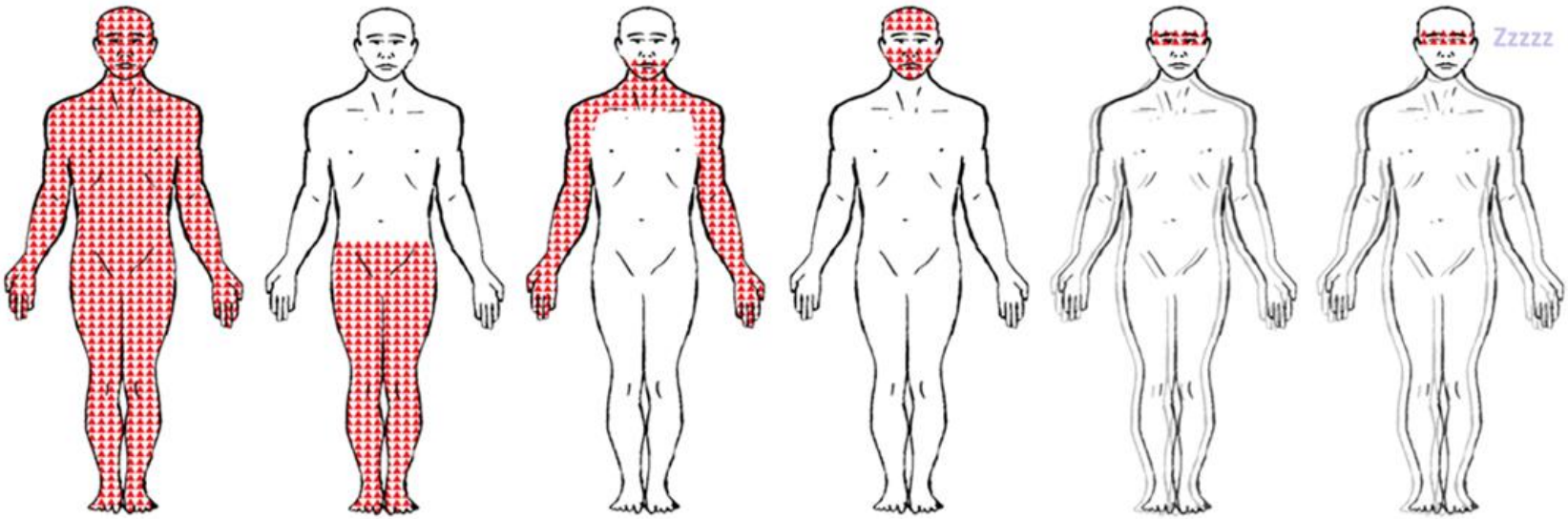
AN UNUSUAL VARIANT OF ACUTE IDIOPATHIC POLYNEURITIS (SYNDROME OF OPHTHALMOPLEGIA, ATAXIA AND AREFLEXIA)*

MILLER FISHER, M.D.†

BOSTON

Guillain-Barré syndrome (GBS)

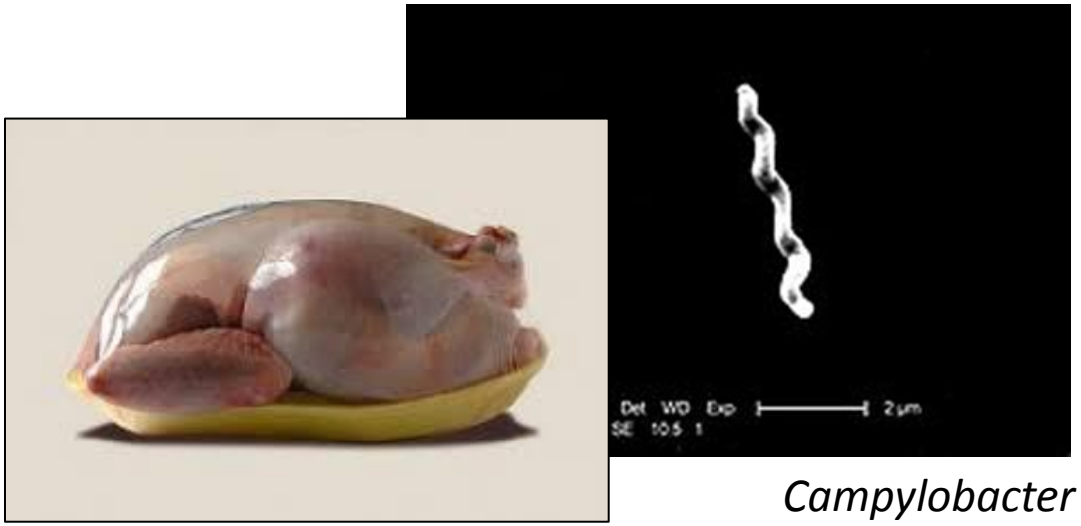
- Spectrum of related disorders



Wakerley et al, Pract Neurol 2014

Infectious triggers

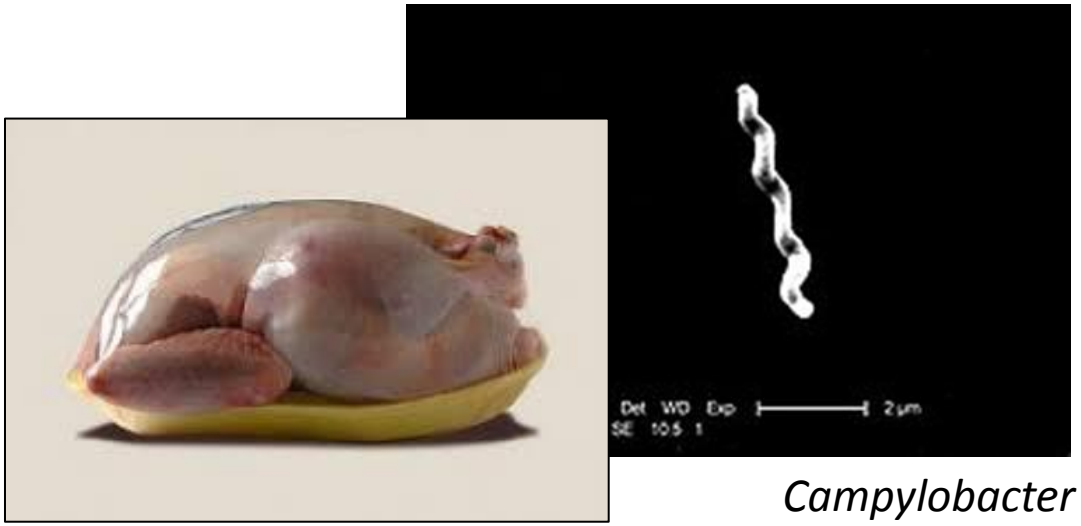
- >60% antecedent infectious symptoms



Campylobacter jejuni

Infectious triggers

- >60% antecedent infectious symptoms



Campylobacter jejuni

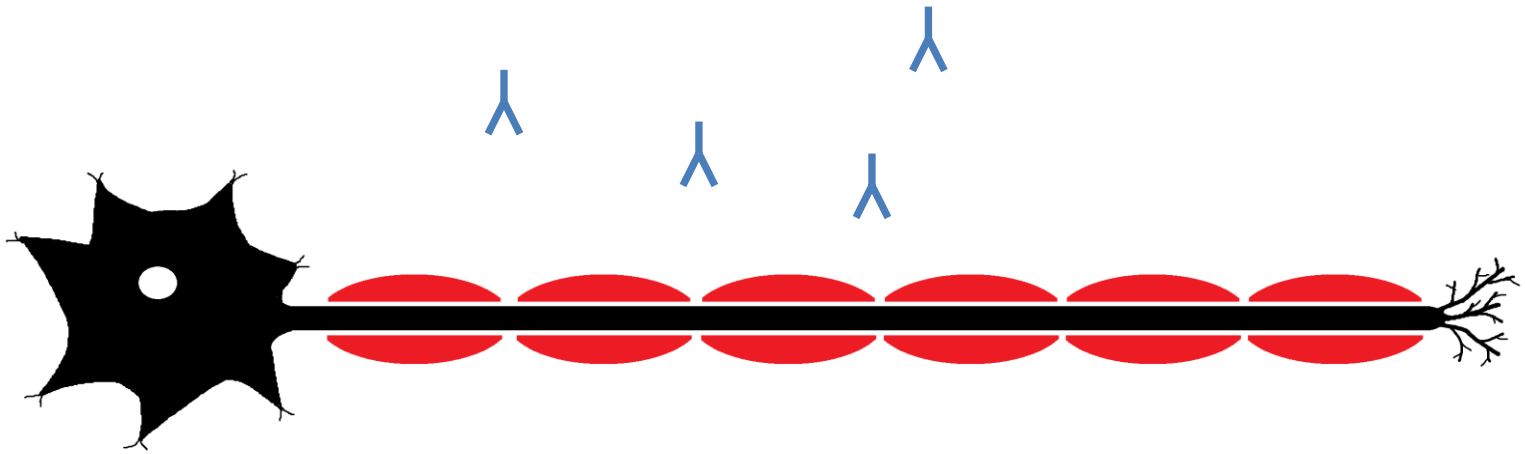
- *Haemophilus influenzae*, *Mycoplasma pneumoniae*
- CBV, EBV, VZV
- Hepatitis E, Influenza A, Zika virus

Infection and molecular mimicry

Infection
(e.g. *C. jejuni*)

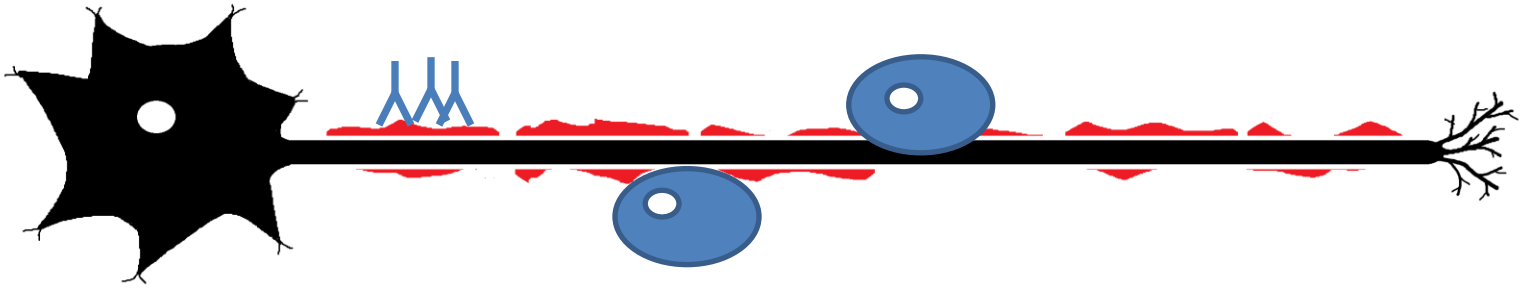
± Antibody production
(e.g. IgG anti-GQ1b abs)

± Nerve damage
(e.g. Miller Fisher Syndrome)



= IgG antibody

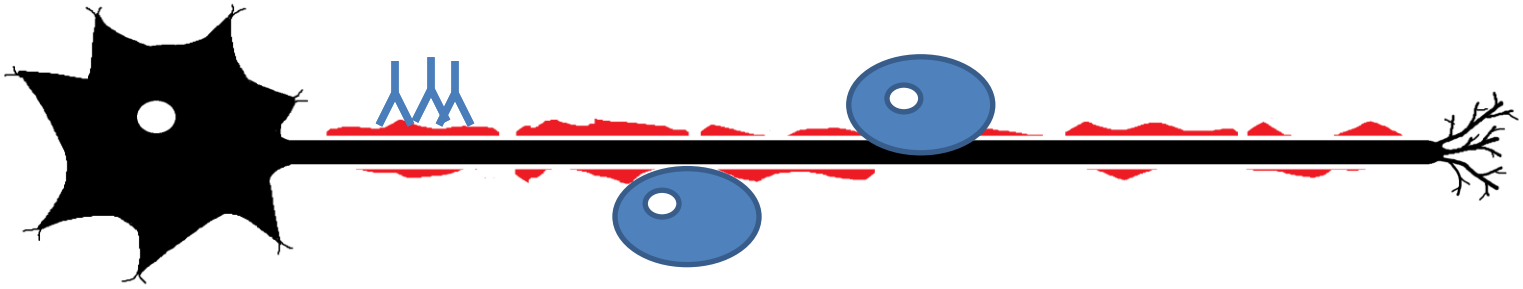
Demyelinating neuropathy – Target unknown



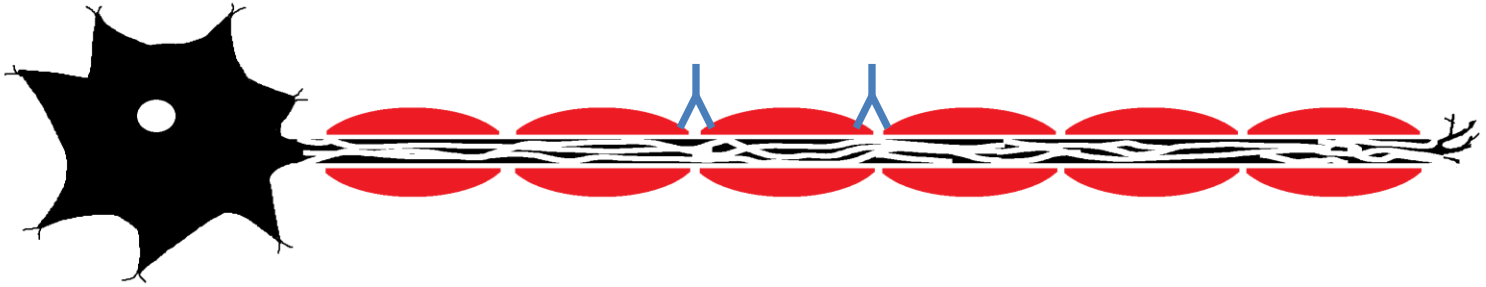
= inflammatory cell

= IgG antibody

Demyelinating neuropathy – Target unknown



Axonal neuropathy – Gangliosides (e.g. GM1, GQ1b)

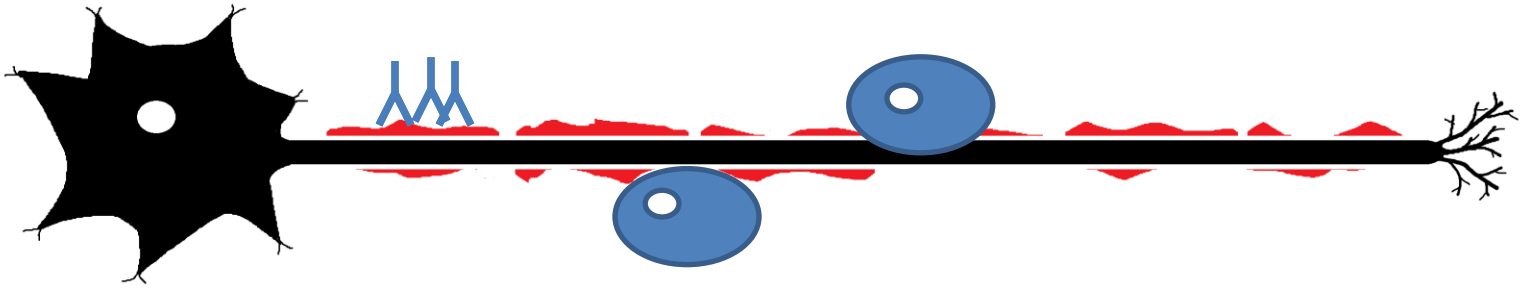


= inflammatory cell

= IgG antibody

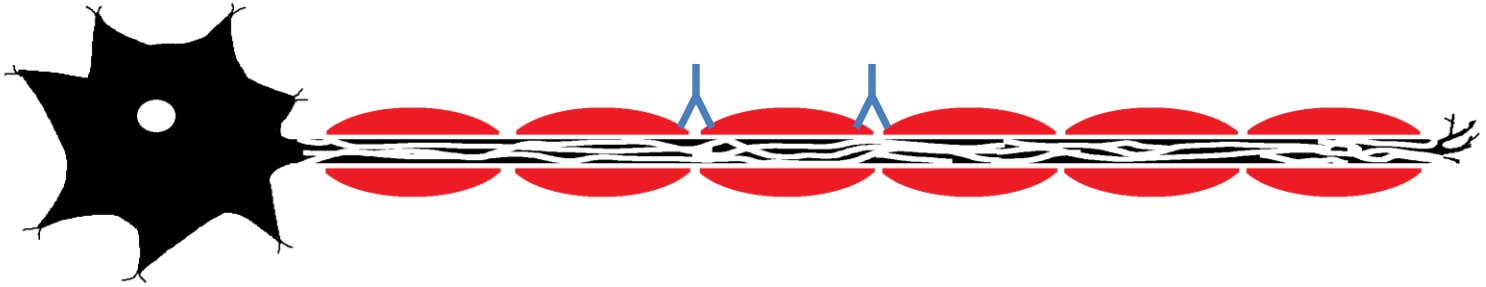
Acute inflammatory demyelinating polyneuropathy (AIDP)

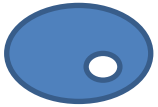
Demyelinating neuropathy – Target unknown



Acute motor axonal neuropathy (AMAN)

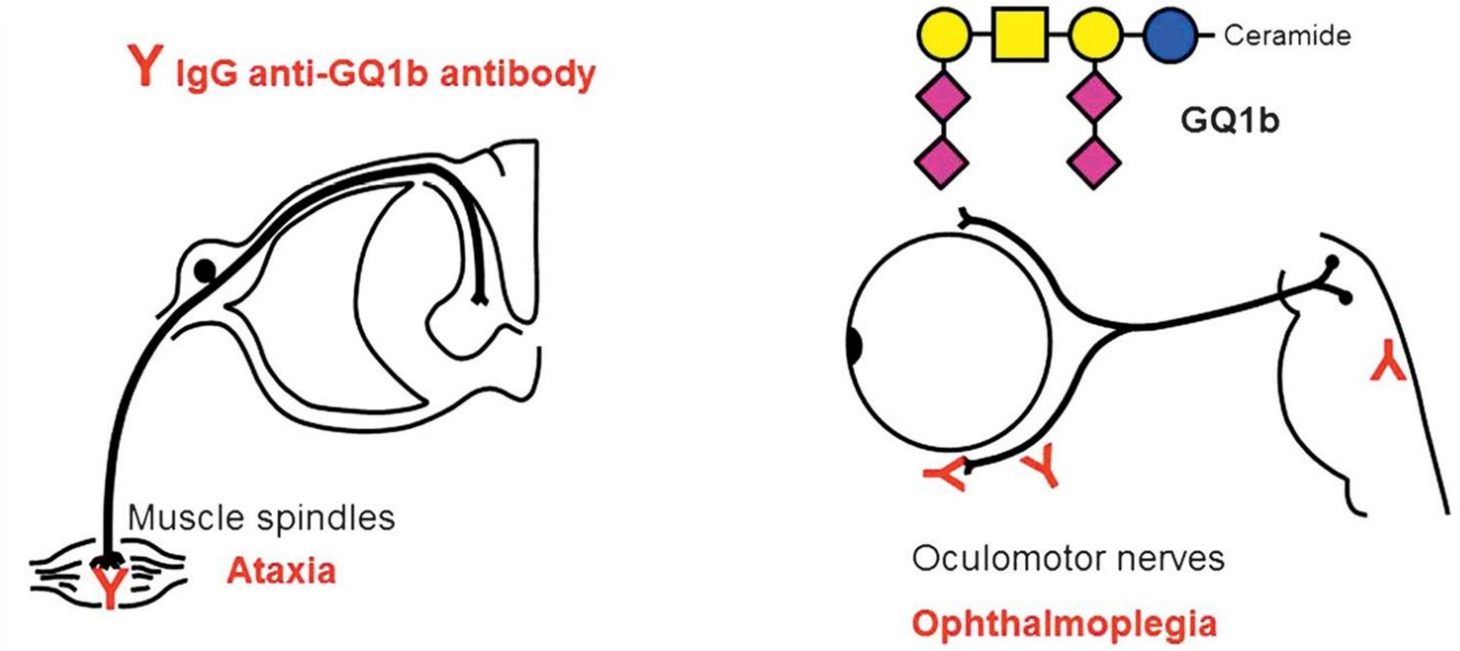
Axonal neuropathy – Gangliosides (e.g. GM1, GQ1b)



 = inflammatory cell

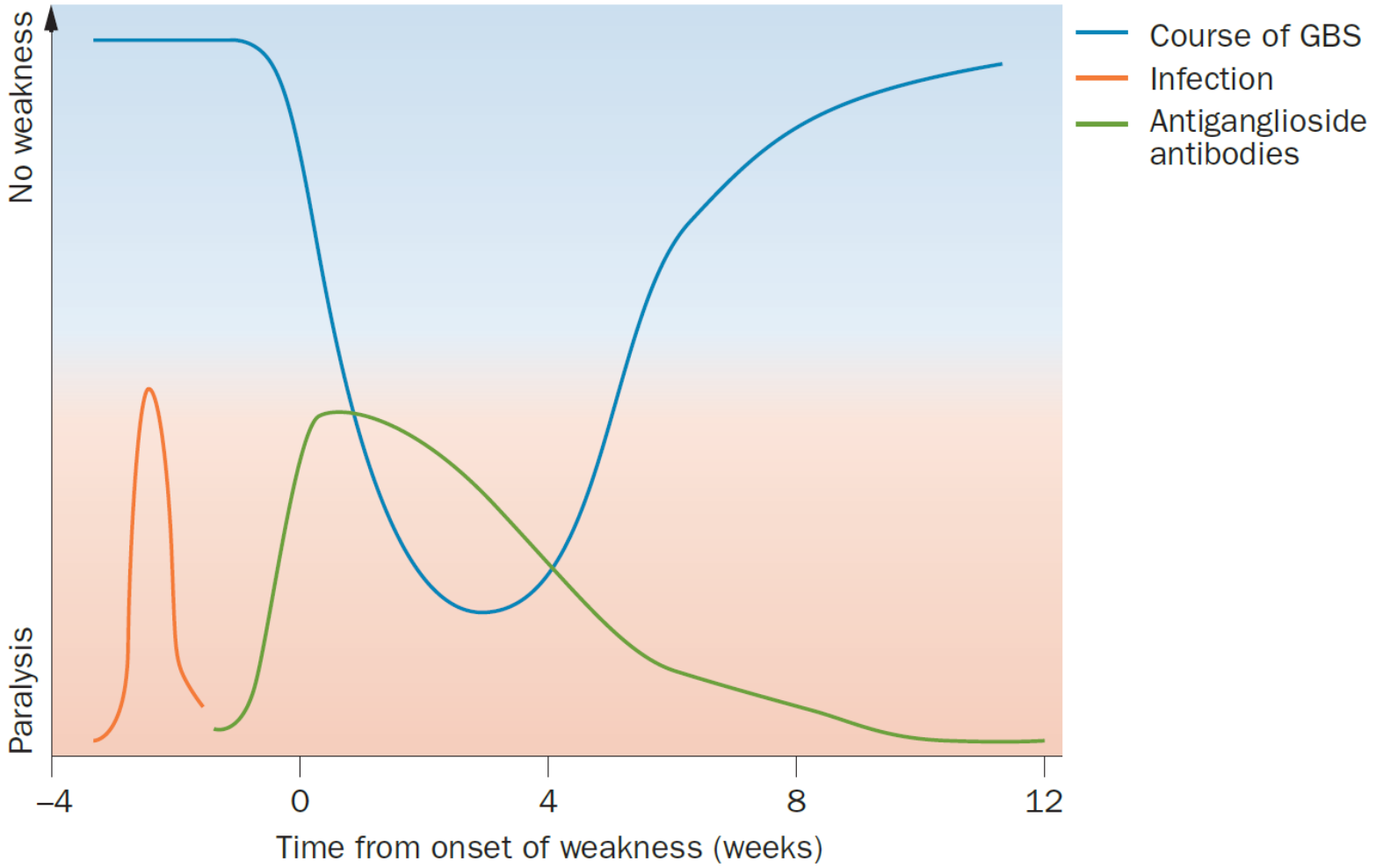
 = IgG antibody

Antibodies TARGET nerves



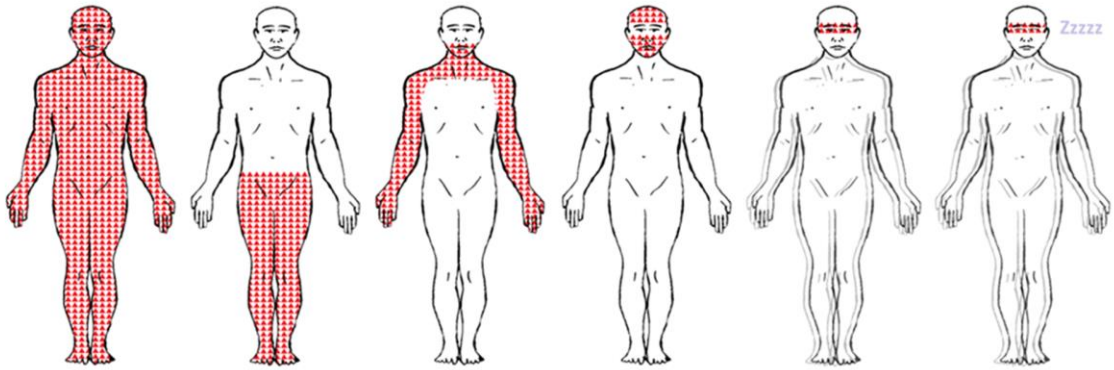
Chiba et al, *Neurology* 1993
Liu et al, *Invest Ophthalmol Vis Sci* 2009
Shahrizaila et al, *J Neurol Neurosurg Psychiatry* 2013

Disease course



van den Berg *et al, Nat Rev Neurol* 2014

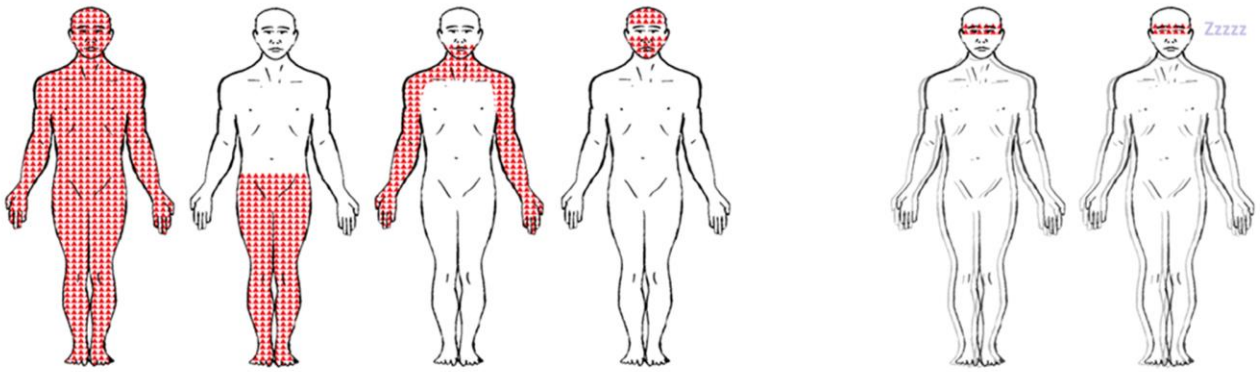
The GBS spectrum



The GBS spectrum

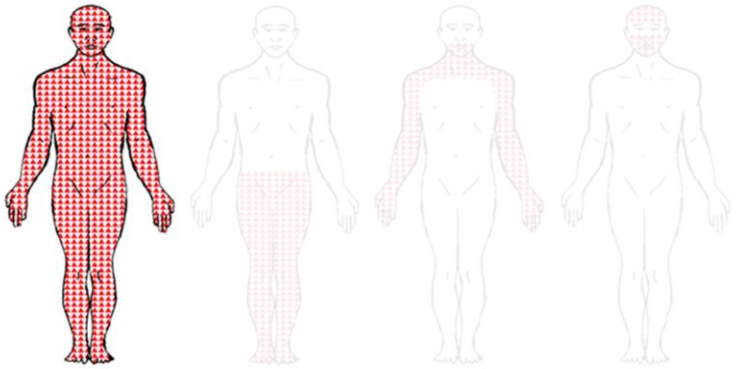
Guillain-Barré syndrome

Miller Fisher syndrome



Guillain-Barré syndrome and Miller Fisher syndrome

Classic GBS

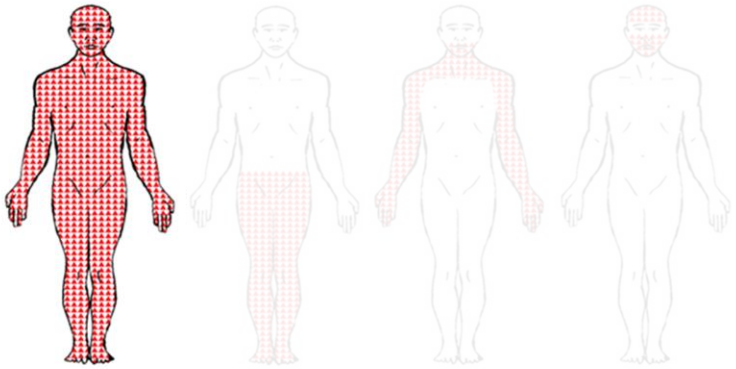


- Tetraparesis
- ± Cranial neuropathy
- ± Respiratory depression

Main differential:
Acute spinal cord injury

Guillain-Barré syndrome and Miller Fisher syndrome

Classic GBS



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Main differential:
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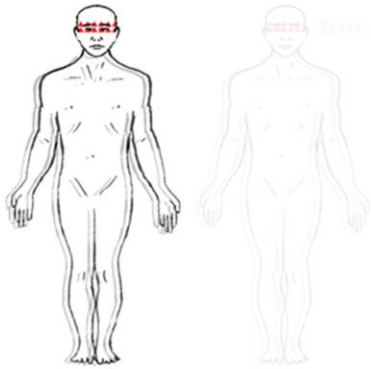
Classic MFS

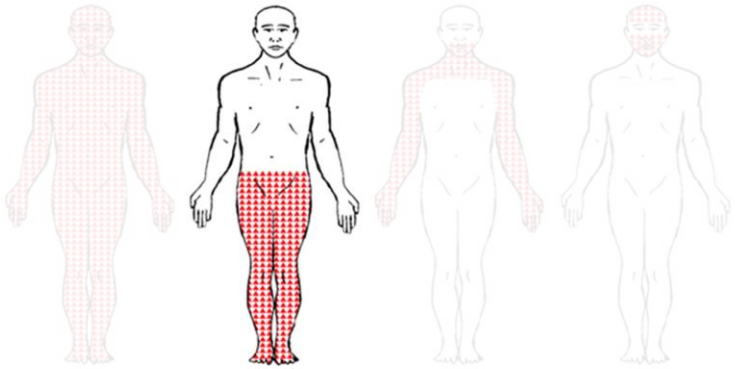


- Ophthalmoplegia
- Cerebellar-like ataxia

Main differentials:
Botulism, myasthenia gravis, brainstem stroke

Localized GBS subtypes

Paraparetic GBS

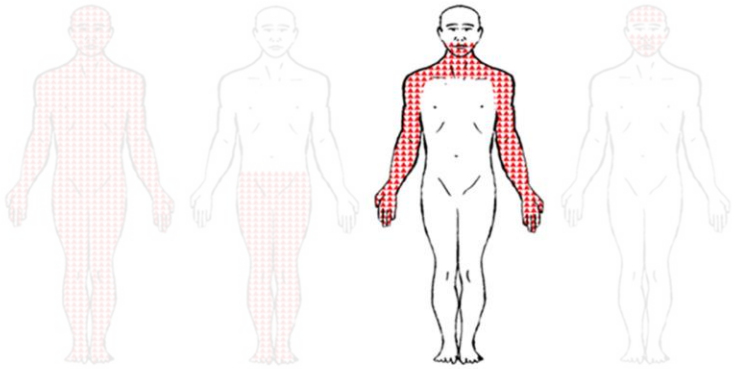


- Leg weakness

Main differential:
Acute spinal cord injury

Localized GBS subtypes

Pharyngeal-cervical-brachial weakness

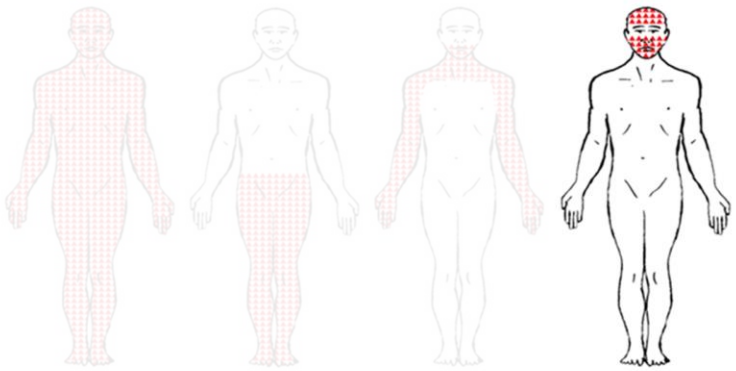


- Bulbar, neck, arm weakness

Main differentials:
Botulism, myasthenia gravis, brainstem stroke

Localized GBS subtypes

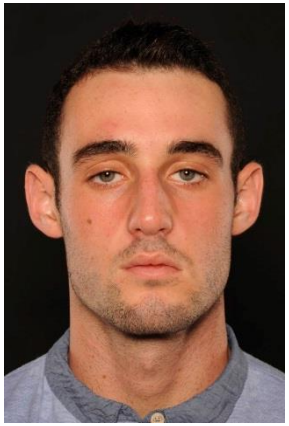
Bifacial weakness with paraesthesias



- Bifacial weakness

Main differentials:
Lyme disease, sarcoidosis

Bifacial weakness with paraesthesias

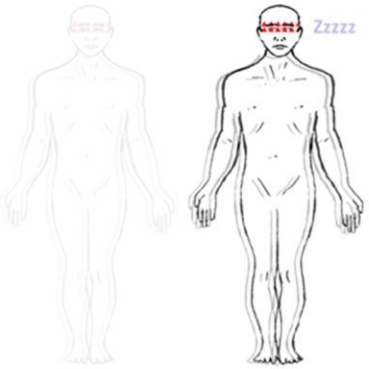


Bifacial weakness with paraesthesias

Morgan et al, *Muscle Nerve* 2016

Miller Fisher syndrome and subtypes

Bickerstaff's brainstem encephalitis



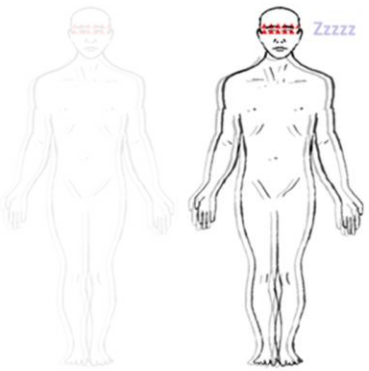
- Ophthalmoplegia
- Cerebellar-like ataxia
- Hypersomnolence

Main differentials:
Brainstem stroke / infection / inflammation

Miller Fisher syndrome and subtypes

Acute ataxic neuropathy
Acute ophthalmoparesis
Acute ptosis
Acute mydriasis

Bickerstaff's brainstem encephalitis



- Ophthalmoplegia
- Cerebellar-like ataxia
- Hypersomnolence

Main differentials:
Brainstem stroke / infection / inflammation

Classification of 103 GBS patients

	%
***Classic Guillain-Barré syndrome**	**71**
***Pharyngeal-cervical-brachial weakness**	**2**
-Acute pharyngeal weakness	-
***Paraparetic GBS**	**1**
***Bifacial weakness with paraesthesias**	**1**
***Classic Miller Fisher syndrome**	**17**
***Acute ataxic neuropathy**	**1**
***Acute ophthalmoparesis**	**1**
-Acute ptosis	-
-Acute mydriasis	-
***Bickerstaff's brainstem encephalitis**	**3**
-Acute ataxic hypersomnolence	-
***GBS + MFS overlap**	**1**
***PCB + MFS overlap**	**1**
***GBS + BBE overlap**	**1**

Kokuban (unpublished)

Making a diagnosis of GBS

History

- Antecedent infectious symptoms?
- Distal paraesthesias?
- Progression to nadir 12 h – 28 days

Making a diagnosis of GBS

History

- Antecedent infectious symptoms?
- Distal paraesthesias?
- Progression to nadir 12 h – 28 days

Examination

- Symmetrical weakness / ataxia
- Hyporeflexia (90%)

Making a diagnosis of GBS

History

- Antecedent infectious symptoms?
- Distal paraesthesias?
- Progression to nadir 12 h – 28 days

Examination

- Symmetrical weakness / ataxia
- Hyporeflexia (90%)

Investigations

- MRI brain / spinal cord
- CSF albuminocytological dissociation
- Nerve conduction studies
- Anti-ganglioside antibodies (GQ1b, GT1a, GD1a, GM1)

Early management

Housekeeping

- Pressure mattress / LMWH/ SALT
- Forced vital capacity +/- ventilator support
- ECG / telemetry

Early management

Housekeeping

- Pressure mattress / LMWH/ SALT
- Forced vital capacity +/- ventilator support
- ECG / telemetry

Immunotherapy

- IVIg (0.4g / kg) for 5 days
- Plasma exchange

Intravenous immunoglobulin (IVIg)

- Check Immunoglobulins
- Risk of venous / arterial thrombosis
- £££

Early management

Housekeeping

- Pressure mattress / LMWH/ SALT
- Forced vital capacity +/- ventilator support
- ECG / telemetry

Immunotherapy

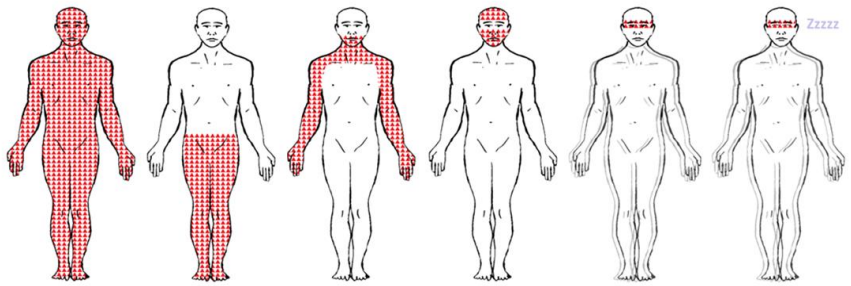
- IVIg (0.4g / kg) for 5 days
- Plasma exchange

Symptomatic

- Analgesia (e.g. Gabapentin)

Summary

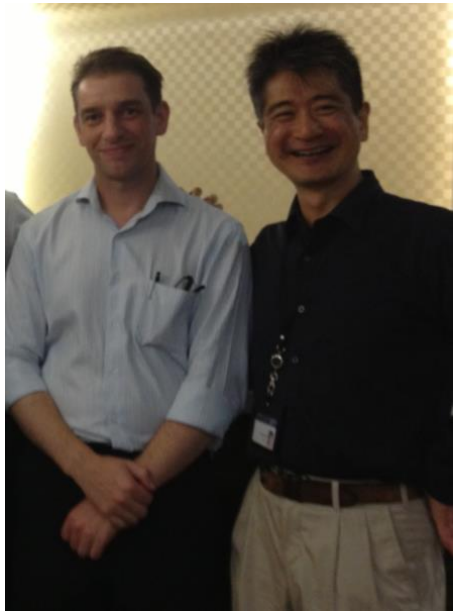
- GBS represents a continuous spectrum of discrete and overlapping syndromes



- Diagnosis can be made on basis of history and examination alone

Acknowledgement

Nobuhiro Yuki
Antonino Uncini



Other members of the GBS-classification group: Badrul Islam, **Bangladesh**; Peter van den Bergh, **Belgium**; Amilton Antunes Barreira, Osvaldo Nascimento, **Brazil**; Steven Baker, **Canada**; Li Yang, **China**; Alain Créange, Jean-Pascal Lefaucheur and Attaria Shahram, **France**; Meena Kannan, **India**; Nobuo Kohara and Norito Kokubun, **Japan**; Nortina Shahrizaila, **Malaysia**; Yee-Cheun Chan, Umapathi Thirugnanam and Einar Wilder-Smith, **Singapore**; Sung-Tsang Hsieh, **Taiwan**; Jong Seok Bae, **South Korea**; Rawiphan Witoonpanich; **Thailand**.