Cerebrospinal fluid oligoclonal IgM bands and disease severity outcome in Guillain-Barré Syndrome

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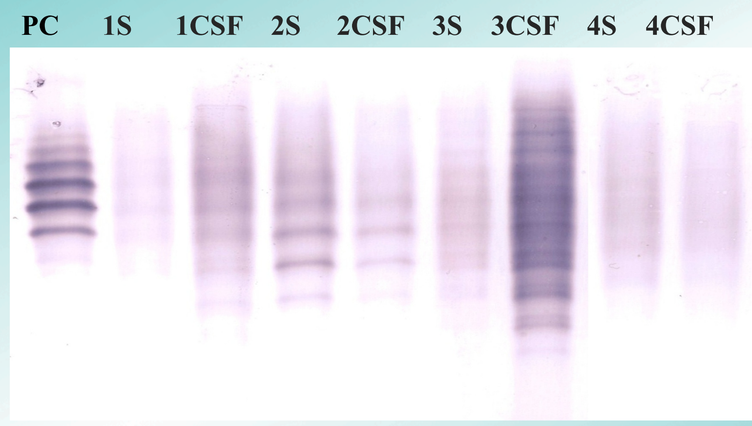
Introduction and Objective

Guillain-Barré Syndrome (GBS) is an acute post-infectious immune-mediated peripheral neuropathy with a highly variable clinical course and outcome.
It is often associated with the presence of identical IgG oligoclonal bands in cerebrospinal fluid (CSF) and serum (IgG mirror pattern). The presence of IgM oligoclonal bands (IgMOB), an unfavourable prognostic factor in Multiple Sclerosis, has not been investigated in GBS. Aim of the study was :

1) to examine the CSF and serum of a group of patients with GBS for the presence of IgMOB and to investigate their correlation with clinical, neurophysiological and laboratory data;
2) to correlate the presence of IgMOB and the other collected variables with the occurrence of severe disability, defined as a score >2 on the GBS Grading Scale (i.e. patient unable to walk indipendently) at entry, at two weeks and at six months.

Figure 1: Isoelectric focusing



PC = positive control; 1.CSF-restricted IgMOB; 2.IgM mirror pattern; 3.IgM Mirror pattern + CSF-restricted IgMOB; 4. Absence of IgMOB; S = serum; CSF = cerebrospinal fluid

Materials and Methods

We examined the clinical records of 95 patients (62M, 33F; mean age: 55 years, range:19-85) and recorded various clinical, laboratory and neurophysiologic variables.
CSF and serum samples, which had been stored at -80°C after sampling for diagnostic purposes, were examined for the presence of IgMOB by means of agarose gel isoelectric focusing (IEF) followed by immunoblotting with polyclonal specific anti-human IgM antibodies (Figure 1).
Possible associations between the collected variables and the IEF patterns were investigated.

Results

An IgM mirror pattern was found in 26 (28%) patients. Of these, 7 (7%) had additional CSF-restricted IgMOB. A further 5 (5%) patients had CSF-restricted IgMOB without an associated IgM mirror pattern. Clinical and laboratory data are shown in Tables 1-2.
Patients with CSF-restricted IgMOB had a greater degree of blood-brain barrier damage (BBB), as measured by the CSF/serum albumin ratio (1.97 vs 0.98; OR: 4.04; p=0.001), a greater amount of CSF proteins (150 mg/dl vs 80 mg/dl; p=0.001; OR:1.2), and were more likely to have had involvement of the cranial nerves at onset (p<0.000; OR: 4.54).
A greater proportion of patients with severe disability had CSF-restricted IgMOB (OR: 3.84; p=0.04), elevated CSF proteins (OR: 1.1; p= 0.005) or an abnormal Link index (OR: 4.3; p= 0.01).

Table 1. Clinical characteristics

Clinical characteristics	
Number of patients	95
Sex (M/F) (%)	62/33 (65/35)
Age (years) (mean ± SD)	55 ± 17
Gastrointestinal prodromes	24 (25%)
Upper respiratory tract infection	41 (43%)
Motor symptoms	82 (86%)
Sensory symptoms	75 (79%)
Cranial nerve involvement	42 (44%)
GBS score at entry (SD)	2.7 (1)
GBS score at 2 weeks (SD)	2.1(1.2)
GBS score at 6 months (SD)	1.17 (1.14)
IVIG therapy (%)	93 (98%)
Plasma exchange therapy	14 (15%)

Table 2. Laboratory data

Laboratory data	
Elevated CFS proteins	68 (71%)
Mean CFS proteins (mg/dl) (SD)	90 (50)
Elevated CFS/serum albumin	62(65%)
Mean CFS/serum albumin (SD)	1.10 (0.76)
Elevated Link Index	20 (21%)
Elevated Reiber Index	10 (11%)
CFS cells > 4	12 (13 %)
Mirror IgG	59 (62%)
Mirror IgM	26 (27%)
CFS restricred IgMOB	12 (13%)
Mirror IgM and/or CFS restricred IgMOB	31(33%)
Serum CMV IgM (73 pts)	7(8%)
Campylobacter (63 pts)	4(5%)
Anti-ganglioside antibodies (74 pts)	21(23%)

Conclusion

IgMOB are detectable in the serum and CSF of patients with GBS. In our patient sample, the presence of CSF-restricted IgMOB was associated with a greater degree of blood-CSF-barrier damage, with higher CSF protein concentrations and with cranial nerve involvement at onset. A high GBS disability score was associated with the presence of CSF-restricted IgMOB, elevated CSF proteins and with an abnormal Link index.

References

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