GanglioCombi ELISA

Screening Tests for Autoimmune-Neuropathies

The Expert's Choice

GanglioCombi: IgG/IgM Mix conjugate for classic initial screening

GanglioCombi-GM: Individual conjugates for IgG and IgM – differential diagnosis of acute and chronic diseases

GanglioCombi-*Light*-GM: Anti-Gangliosid antibody profiles for the clinically most relevant Gangliosides

Quantitative: Clinically defined titer catagories

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Introduction

The diagnosis of peripheral Neuropathies increasingly is relying on the use of anti-Ganglioside antibody tests. Conditions such as Guillain-Barré Syndrome (GBS) and its variants and a variety of sensory and motor neuropathy syndromes can now be defined in terms of immunologic profiles. Detection of these autoantibodies indicates an immune-mediated origin of the peripheral nerve disturbances and that immune suppressive therapy may be beneficial.

Gangliosides and anti-Ganglioside Autoantibodies

Elevated antibody titers may occur as monoclonal IgMs or polyclonal IgGs. There is a large number of gangliosides which differ in terms of its number and position of hexoses and sialic acid residues (Figure 1). Consequently, there are many targets giving rise to various antibodies each of which differs in its specificity. There are differences in structure, quantity and distribution of different gangliosides in the nervous system. For example motor nerves are particularly rich in GM1 or GD1b, whereas in sensory nerves polysialo-gangliosides are predominant.

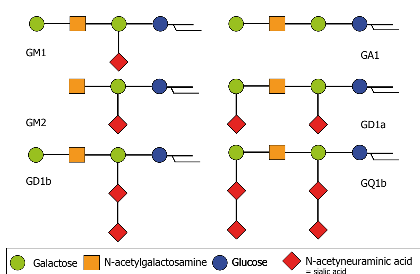

Figure 1. The most important and clinically relevant gangliosides.

Chronic Polyneuropathies - IgM

Anti-ganglioside activity was foremost detected in patients with clinical signs of neuropathy who are suffering from monoclonal IgM gammopathy. Autoantibodies detected in patients with Motor neuropathy are directed against GM1, GD1b and GM2. Sensory neuropathies are associated with GD1b and GQ1b but not with GM1. The neuropathy which affects big fibers, with ataxia and areflexia, ophthalmoplegia in some cases and antibodies against disialosyl gangliosides (*eg* GD1b or GQ1b) is called CANOMAD (Chronic Ataxia, Neuropathy, Ophthalmoplegia, M-protein, Agglutinin, Disialosyl antibodies). For multifocal motor neuropathy (MMN), it has been published that patients with polyclonal IgM anti-ganglioside antibodies tend to respond to immune suppressive treatments. Thus, Anti-ganglioside autoantibodies diagnostic is of great importance. In addition, anti-ganglioside antibodies may be detected in the absence of a monoclonal gammopathy.

Clinical Syndrome	Antibody	
	Specificity	**Isotype**
Chronic sensori-motor demyelinating Neuropathy	SGPG, MAG	IgM
CANOMAD	GD1b, GQ1b	IgM*
MMN	(asialo)-GM1, GD1b, GM2	IgM
AM(S)AN	GM1, GD1a	IgG
MFS	GQ1b	IgG

Table 1. Clinical Syndromes associated with specific and clinically most relevant anti-glycolipid antibodies. Abbreviations/footnotes:

* usually present as IgM monoclonal gammopathies; **SGPG**: sulphated glucuronyl paragloboside; **MAG:** Myelin Associated Glycoprotein; **CANOMAD:** chronic ataxic neuropathy with ophthalmoplegia, M-protein, Agglutinin and Disialosyl antibodies; **AMAN:** acute motor axonal neuropathy, **MFS:** Miller-Fisher Syndrome.

Acute Neuromuscular Paralysis - IgG

Anti-ganglioside antibodies of IgG class are detected in some acute forms of polyradiculoneuritis. The most important one is a pure motor form of the Guillain-Barré Syndrome (GBS) with axonal damage (*eg* AMAN, acute motor axonal neuropathy). It is caracterized by very high titers of anti-ganglioside antibodies, mainly directed against GM1 and GD1b. The Miller-Fisher syndrome (MFS) is associated with the paralysis of oculomotor nerves and ataxia. It is characterized by the occurrence of anti-GQ1b antibodies.

The occurence of these antibodies may be explained with molecular mimicry: *Campylobacter jejuni* strains contain sugar determinants very similar to some gangliosides. In addition, other infectious agents might be involved in the pathogenesis.

Anti-Ganglioside Antibody Profiles

Considering the diversity of anti-ganglioside antibodies, the measurement of the appropriate and clinical relevant anti-ganglioside antibody panels is important to maximize the detection of neuropathy-associated anti-ganglioside antibodies. Furthermore, a differential analysis of IgG and IgM class antibodies is important, particularly as IgG antibodies are associated with acute diseases, whereas the occurrence of IgM antibodies is typical for chronic conditions.

Frequency of anti-Ganglioside Antibodies

In a study in which n=124 post-infectious GBS patients have been included, the most commonly implicated anti-ganglioside antibodies were GM1 (38%), GD1a (12%), GM2 (23%), GQ1b (9%) and GD1b (9%), (PhD thesis, D. Taravel, 2008).

Detection of anti-Ganglioside Antibodies

The quantitative ELISA technique is recommended as the method of choice for anti-ganglioside autoantibodies analysis. BÜHLMANN offers a panel of quantitative GanglioCombi formats for comprehensive and basic screening. The results are reported in clinically defined titer categories.

Differentiation between acute and cronic disease: **GanglioCombi-GM**; Differentiation of sensory and motor neuropathies: **GanglioCombi**; Differentiation of particular neuropathies: **GanglioCombi-*Light*-GM.**

Ordering codes:

EK-GCO	12 patient profiles
EK-GCO-GM	2x12 patient profiles
EK-GCL-GM	12 patient profiles

Related products:

EK-MAG	96 wells
EK-SGPG	96 wells
EK-GM1-GM	96 wells

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