Neuberg DIAGNOSTICS

● India ● UAE ● South Africa ● USA

New INSIGHTS

Diagnostic Approach

To Neurological Diseases

Serial number : 023 Edition : 1. 2022

Our Specialized Test Panel

Sr.No	Test	Test Components	Method	Specimen/ Transport	TAT/ Batch	Clinical Applications
1	Auto-immune Encephalitis Panel	NMDA, VGKC, GABA, AMPA 1 & 2	IIF (Cell based assay)	SERUM/CSF	Wed, Sat	For auto immune encephalitis
2	Paraneo-plastic Panel (6 Ag & 12 Ag)	6 Ag (Anti Amphiphysin, Anti CV2, Anti-PNMA2, Anti Ri/Anna2, Anti Yo/Pca1, Anti Hu/Anna-1) 12 Ag (Anti Amphiphysin, Anti CV2, Anti-PNMA2, Anti Ri/Anna2, Anti Yo/Pca1, Anti Hu/ Anna-1, Anti Recoverin, Anti SOX1, Anti Titin, Anti Zic4, Anti GAD65, Anti Tr(DNER))	Immunoblot (EIA)	SERUM	Wed, Sat	For paraneo-plastic syndrome
3	NMO		IIF (Cell based assay)	SERUM/CSF	6 hours Wed, Sat	For Neuromyelitis optica spectrum disorder (NMOSD)
4	NMO / MOG		IIF (Cell based assay)	SERUM/CSF	6 hours Wed, Sat	For Neuromyelitis optica spectrum disorder (NMOSD)
5	AChR Antibody		ELISA	SERUM	6 hours Wed, Sat	Myasthenia Gravis
6	MuSK Antibody		ELISA	SERUM	6 hours Wed, Sat	Myasthenia Gravis
7	CSF Electrop-horesis		Isoelectric focusing	CSF, SERUM	1D	Multiple Sclerosis
8	CSF IG G INDEX	CSF IG G, SERUM IG G, CSF AND SERUM ALBUMIN	IT, Nephelometry, ELISA	CSF, SERUM	4 H	Multiple Sclerosis
9	MEASLES, HSV, VZV Specific IgG INDEX	CSF IG G, SERUM IG G, CSF AND SERUM MEASLES, HSV,VZV	IT, Nephelometry, ELISA	CSF, SERUM	2 days	To know disease specific intrathecal synthesis of IgG
10	Beta Trace Protein		Nephelometry	FLUID, SERUM	4 H	CSF rhinorrhoea
11	Cysticercus Ig G		ELISA	SERUM	8 H	Neuro-cysticercosis
12	Lymes's disease Ig G & M	Borrelia burgdorferi IgG	ELISA	SERUM	8 H	LYME'S disease

Sr.No	Test	Test Components	Method	Specimen/ Transport	TAT/ Batch	Clinical Applications
13	Ganglioside Panel (Ig G & Ig M)	GM1,GM2, GM3,GD1a, Gd1b & Gq1b	Immunoblot (EIA)	SERUM	8 H	For autoimmune Peripheral Neuropathy
14	Heavy Metal Panel	Arsenic Bismuth Cadmium Chromium Cobalt Copper Iron Lead Manganese Mercury Nickel Selenium Thallium Zinc	ICPMS	Serum+EDTA+ Urine (Metal free container	2 Days	Peripheral Neuropathy
15	Anti Epileptic drugs	Carbamazepine, Sodium valproate, Phenobarbitone, Lamotrigine, Levetiracetam, Oxcarbazepine, Ethosuximide	LC-MS/MS & CLIA	SERUM	Daily except Sunday (12 pm cut off)	To monitor level of Anti epileptic drugs
16	IgLON 5		IIF (Cell based assay)	SERUM	Wed, Sat	Differential diagnosis of autoimmune encephalitis, Creutzfeldt-Jakob disease or Rapidly progressive neurode - generative dementia.
17	Myositis Panel	Mi-2a, Mi-2ß, TIF1-Y,MDA-5, NXP2, SAE-1, Ku,PM Scl-100, PM Scl-75, Jo-1, SRP, PL-7,PL-12, EJ,OJ, Ro-52	Immunoblot (EIA)	SERUM	8 H	Myositis

Infections

Infection

Meningitis

Viral Encephalitis Panel (Multiplex PCR)

- ✓ HSV 1
- ✓ HSV 2
- ✓ VZV
- ✓ Enterovirus
- ✓ Mumps
- ✓ Human Parechovirus

Encephalitis

PCRs

- ✓ CSD HSV 1 + 2 PCR
- ✓ CSF CMV PCR
- ✓ CSF Rubella PCR
- ✓ CSF Japanese
- ✓ Encephalitis Virus PCR
- ✓ CSF EBV PCR
- ✓ XSF Parvo B19 PCR
- ✓ CSF Toxo PCR

SSPE
(Subacute Sclerosing Pan Encephalitis)

Antibody Detection
Schedule 24 hrs

- ✓ MEASLES
- ✓ HSV
- ✓ VZV Specific IgG INDEX

Autoimmune Encephalitis

Antibody Associated CNS Diseases

The finding of neurologic specific auto-antibodies is a cornerstone in new classification of the disease. It also enables a more rational therapeutic strategy

- Intrathecal synthesis of specific auto-antibodies can be a feature of some autoimmune encephalitides
- These disorders may be with or without association to a neoplasm

Autoimmune Encephalitis Panel

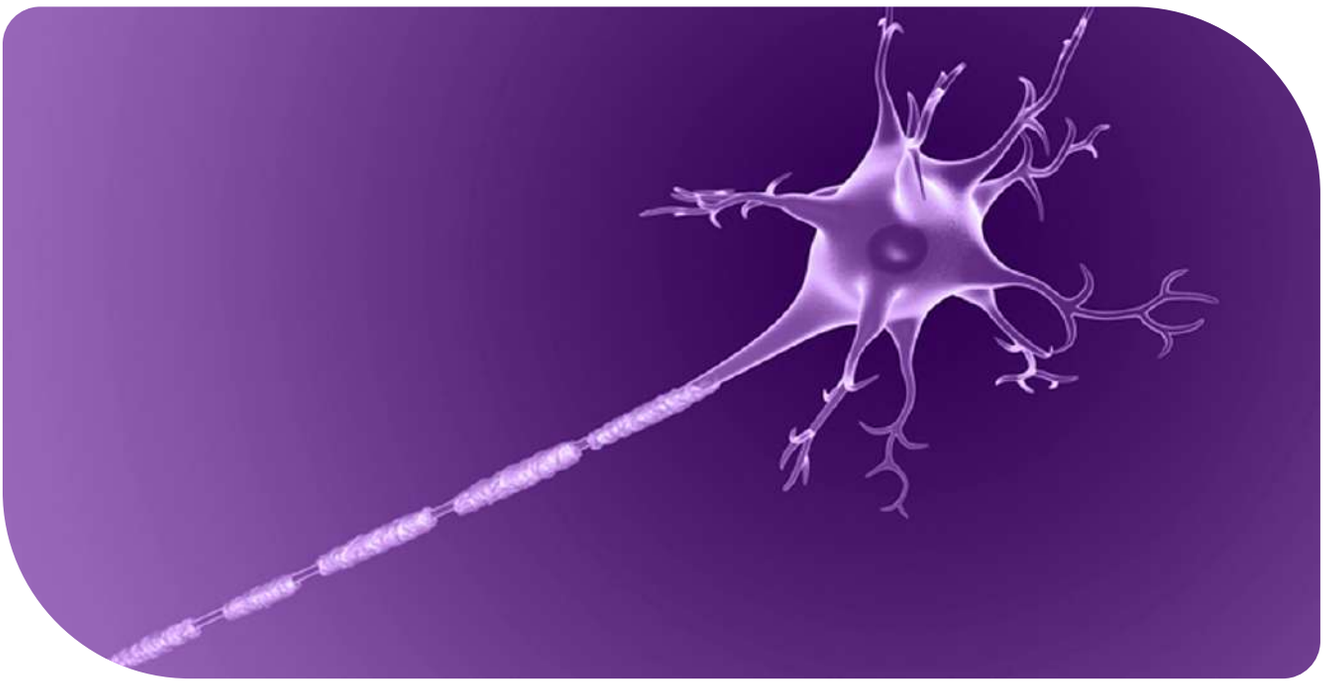
- ✓ NMDA (anti-gluamate receptor against Nr1 subunit)
- ✓ AMPA (anti-glutamate receptor)- GluR1
- ✓ AMPA (anti- glutamate receptor) - GluR2
- ✓ GABA-B receptor antibody
- ✓ LGI -1 antibody (VGKC type)
- ✓ CASPR2 antibody (VGKC type)

By Immunoflouroscene
(Cell Based Assay)

IgLON5

- The cell membrane antigen IgLON5 is an immunological target for specific autoantibodies. The association of IgLON5-autoantibodies is conspicuous with sleep disorders from parasomnia to complete sleeplessness. The disorders occur both in the rapid-eye movement (REM) as well as in the non-REM sleep phases. The most frequent symptoms during these sleep dysfunctions are abnormal movement and behaviour, obstructive sleep apnoea, stridor, dysarthria, dysphagia, sleepwalking, ataxia and chorea.
- It is suspected that IgLON5 autoantibodies lead to pathological aggregation of tau proteins in the brain and thus to neurodegenerative disease. In differential diagnostics these recently described autoantibodies are particularly relevant in patients with suspected limbic encephalitis.

Multiple Sclerosis



Early diagnosis & early treatment are critical to prevent irreversible long- term sequelae in patients with Multiple Sclerosis

Multiple Sclerosis Profile

OCB (Oligoclonal Band) by Isoelectric focusing

- A gold standard technique for daignosis of Multiple Sclerosis
- Useful in patients with equivocal clinical presentation and radiological findings

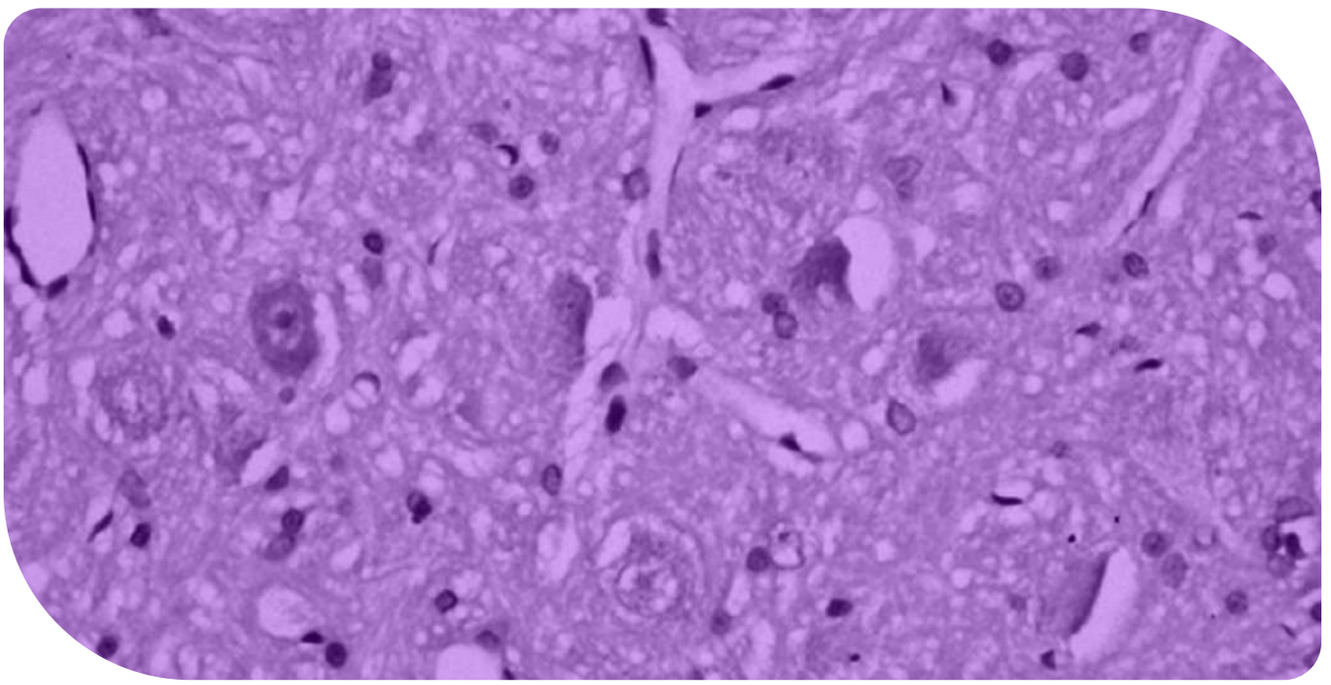
Method : Isoelectric focusing

CSF IgG Index

- Abnormal CSF IgG indexes and OCB patterns have been reported in 70-80% of Multiple Sclerosis patients.
- The use of CSF index plus OCB has been reported to increase the sensitivity to over 90%
- The index is independent of the activity of the demyelinating process

Method - Nephelometry, IT

Anti- Ganglioside Anitibody, Serum (IgG & IgM)



New Target Antigens in Guillian – Barr Syndrome (GBS) & Related Disorders

- Gangliosides comprise 10 -20% of the total lipid of the outer neuronal membrane layer 10 times more than in non-neuronal cells.
- Form antigenic targets for anti-ganglioside antibodies in various forms of GBS.
- Clinical features of GBS are composed of different subtypes & each subtype is closely associated with specific anti-ganglioside antibodies.

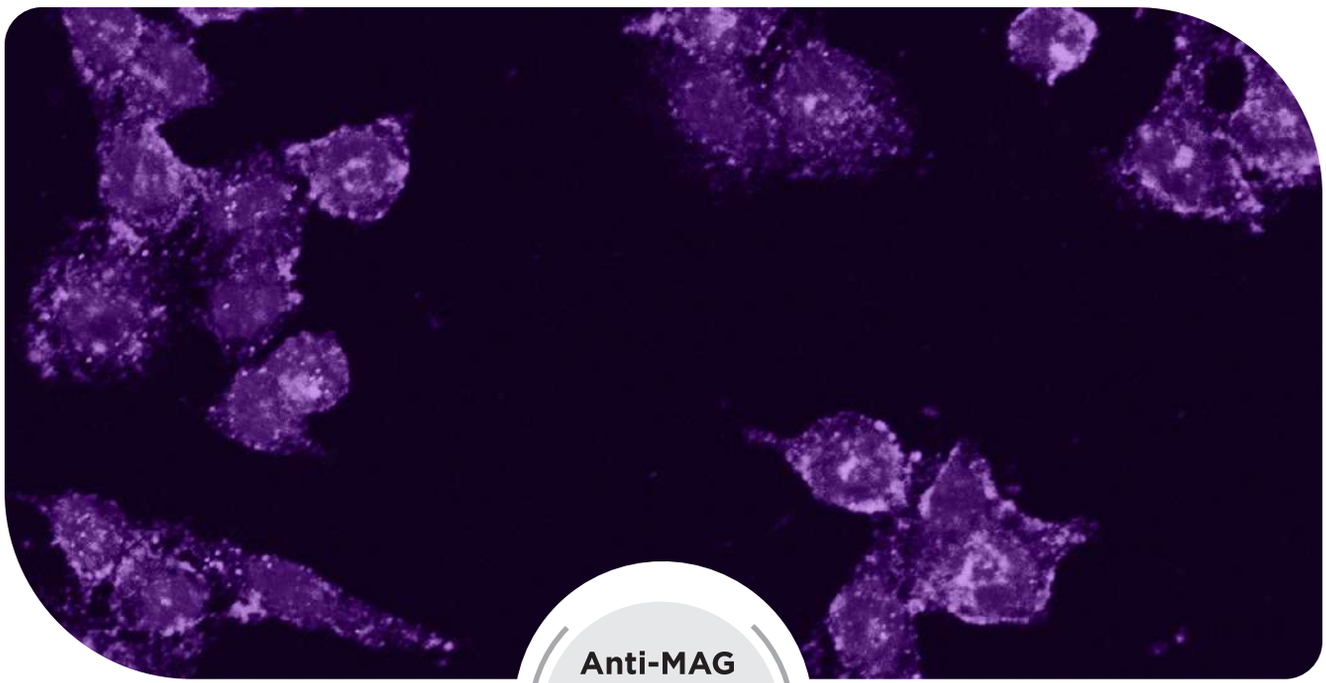
Target antigens of anti-ganglioside antibodies & associated clinical features

Antigens	Disease association/prevalence
Gm1	Mutifocal motor neuropathy (40-70%) Guillian Barre syndrome(22-30%)
Gm2	Multifocal motor neuropathy, Guillian-Barre syndrome & variants
Gm3	Multifocal motor neuropathy
Gd1a	Guillian Barre syndrome & variants
Gd1b	Sensory neuropathy
Gt1b	Guillian Barre syndrome & variants
Gq1b	Miller Fisher syndrome (90%)

Anti-Ganlioside Antibody Tests

- Method of detection : Immunoblot (EIA)
- Detects IgG & IgM In human serum against seven antigens including GM1,GM2,GM3,GD1a, GD1b & GQ1b

Anti - MAG Antibody



Anti-MAG (Myelin Associated Gycoprotein) Antibodies

MAG –

- A minor component of myelin in central & peripheral nervous system
- Implicated in formation & maintenance of myelin

Detection of MAG IgG auto – antibodies suggests active demyelination in a peripheral neuropathy

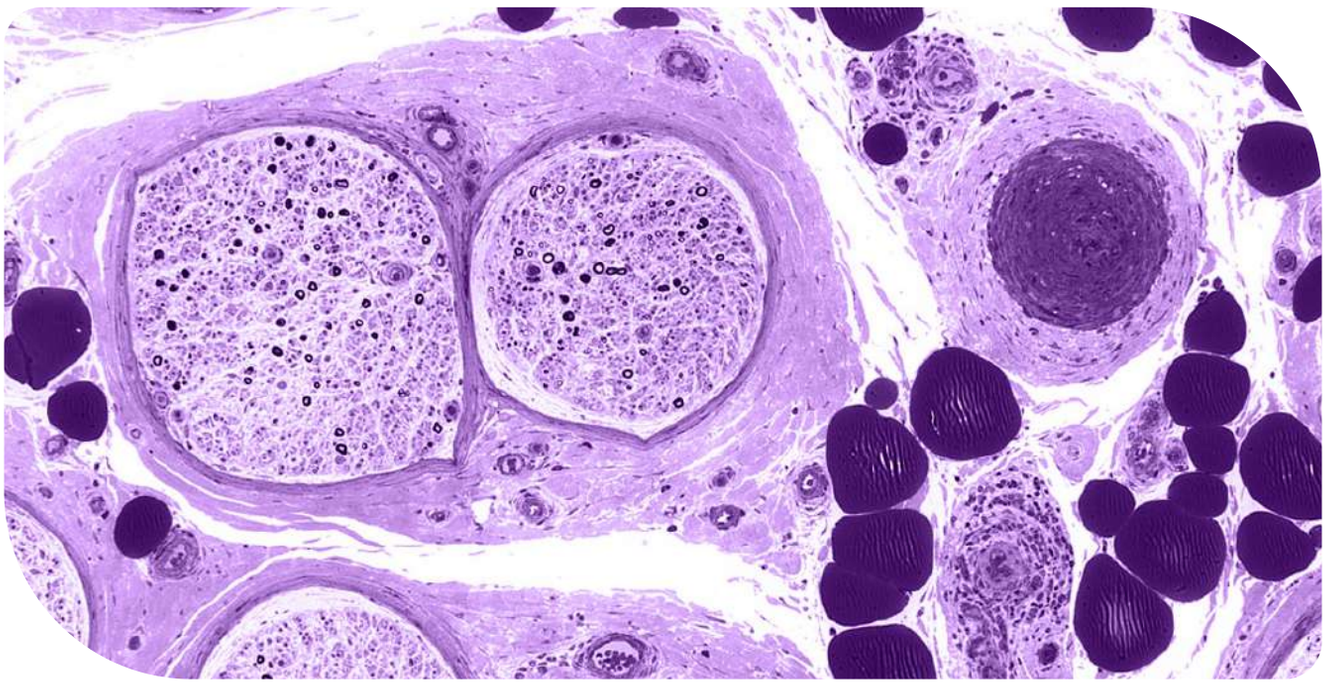
Clinical Significance

- Of all the peripheral neuropathy cases with IgG paraproteinemia, 50% posses anti-MAG antibodies
- Neuropathies associated with anti-MAG with IgM paraproteinemia are slowly progressive with evidence of demyelination and a variable degree of axonal loss usually associated with gait ataxia

Anti-MAG IgG

- **Done by indirect immunofluorescence**
  Batch : Wed, Sat

Heavy Metal Analysis For Peripheral Neuropathy



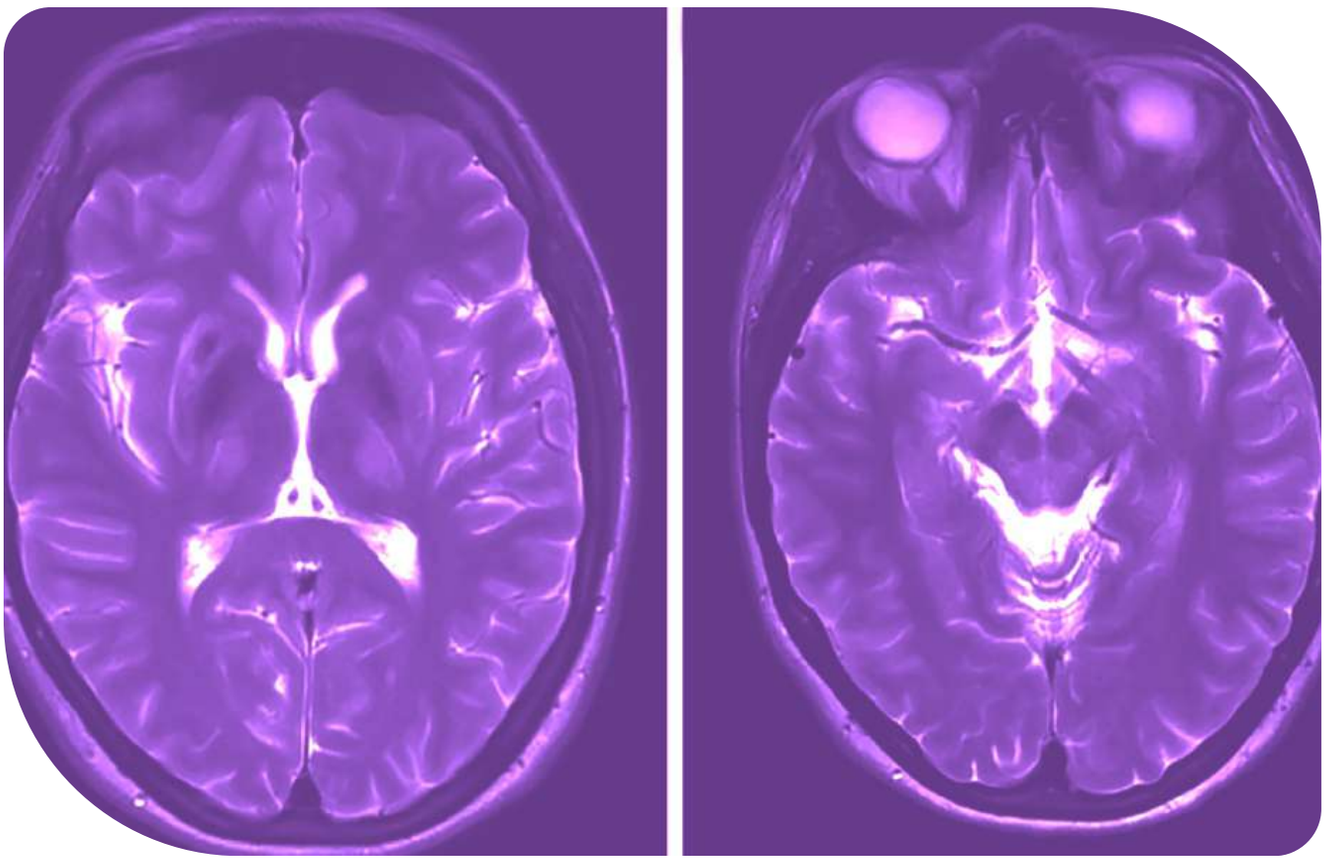
Peripheral Neuropathy, also known as peripheral neuritis, is a neurological disorder that has many causes. It can be caused by disease, alcoholism, and toxins. These toxins can range from organic herbicides, heavy metals and pharmaceuticals. Heavy metal analysis is done by ICP-MS method. This can detect them at PPB (Parts Per Billion) level.

Following heavy metal analysis panel is done for Peripheral neuropathy:

- ✓ Arsenic
- ✓ Bismuth
- ✓ Cadmium
- ✓ Chromium
- ✓ Cobalt
- ✓ Copper
- ✓ Iron
- ✓ Lead
- ✓ Manganese
- ✓ Mercury
- ✓ Nickel
- ✓ Selenium
- ✓ Thallium
- ✓ Zinc

***Individual metal analysis is also available by ICP-MS method.**

Wilson's Disease



Neurological dysfunction constitues the initial clinical manifestation in 40-60% of individuals with Wilson's disease

Psychiatric features were evident at the time of initial presentation in 65% of individuals with Wilson's disease

Estimation of serum copper, serum ceruloplasmin and 24 h urinary copper is recommended for suspected Wilson's Disease (WD)

- In any young person who develops unexplained psychiatric dysfunction, especially when any signs of neurological dysfunction are also present.
- Poor school performance, especially if coupled with abdominal symptoms
- In young persons suspected of drug abuse, because the symptoms can be similar

Recommendations for Diagnostics Testing :
S Copper & Urine Copper - ICM-MS method

Why by ICP-MS Method

Inductively Coupled Plasma Mass Spectrometry

- A method to measure trace elements at PPB which is helpful for the detection of toxicity at a very lower level.
- Accurate, Ultra sensitive with simultaneous measurement of more than one elements.

Neuromyelitis Optica

- Antibodies to aquaporin - 4 (also known as AQP4 -Ab or NMO-IgG) are sensitive & highly specific serum markers of autoimmune NMO
- AQP4-Ab Testing can be of diagnostic relevance independently of disease activity or treatment status

AQP4 - Abs are detectable in 60-90% of patients with NMO/MOG but are virtually absent in patients with MS and other inflammatory and non-inflammatory neurological diseases

Testing for AQP4 antibodies not only enables a reliable distinction to be made between NMO and MS, but also facilitates differential diagnosis concerning other autoimmune diseases affecting the CNS

NMO-IgG / MOG positive alone	75% sensitive 90% specific	When trying to differentiate NMO from MS with optic nerve/ spinalcord involvement
Normal brain MRI plus NMO-IgG positive/MOG	>94% sensitive >90% specific	For clinical diagnosis of NMO

Myasthenia Gravis

The Invisible Disability

Myasthenia Gravis Profile

AChR Antibody (Acetyl Choline Receptor Antibody)

- Considered a diagnostic “gold Standard” for diagnosis of Myasthenia Gravis
- Occurrence in a nearly 80-85% of patients with generalized myasthenia gravis and 50-60% cases of colour myasthenia gravis
- False-positive anti-AChR Ab test results have been reported in cases in cases of Thymoma without MG and in patients with Lambert-Eaton myasthenic syndrome

Anti-Musk Antibody

(Muscule Specific Receptor Tyrosine Kinase)

- Found in a subset of seronegative myasthenia gravis
- These patients represent distinct group of autoimmune MG, in that they show some collective characteristics that are different from those of anti-AchR-positive patients.

Spinocerebellar Ataxia (SCA)

Genetics Testing For SCA:
Detects CAG Repeat Expansions

Normal

CAGCAGCAGCAGCAGCAGCAG

Expanded

CAGCAGCAGCAGCAGCAGCAGCAGCAGCACAGCAGG

Type	Chromosome location of gene	Normal repeat size	Expanded repeat Size
SCA 1	6	6-36	39-83
SCA 2	12	15-31	34-220
SCA 3	14	12-40	55-86
SCA 6	19	4-18	21-33
SCA 7	3	4-19	37-300
SCA 12	5	7-28	66-78

Huntington's Disease (HD)

Genetic testing for Huntington's disease is important for confirmation of clinical diagnosis in a symptomatic individual and for pre-symptomatic testing in adults

Huntington Diease Mutation Analysis

The Huntington(IT15) gene and the huntingtin protein

- The Hungtigton gene directs the cell to make the huntingtin protin.
- Huntingtin protein contains a sequence in which the amino acid glutamine is repeated a number of times. These glutamine residues are encoded in the gene by the DNA trinucleotide "CAG". The Number of times that "CAG" is repeated (the CAG repeat number) determines the number of consecutive glutamines that segment of the huntingtin protein.

Knock out medical emergencies, before it's too late!

**HEALTH ko aasani se na lo,
TEST aasani se karo**

- **Blood Tests**
- **Health Packages**
- **ICMR ApprovedCOVID Tests**

**" Get your blood test done
Anywhere, Anytime...
Neuberg hain na "**

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