WHEN TO CONSIDER MUCOPOLYSACCHARIDOSIS (MPS)

MULTI-SYSTEMIC, PROGRESSIVE IMPAIRMENT[1]

Types of symptoms, associations, age of onset and severity vary depending on patients and types of MPS

Maladies rares Héréditaires du Métabolisme
Filière nationale de santé

Clinical signs

Changes to growth patterns

Initial early height/weight gain then **rupture of the growth curve** or **early downturn of the curve**

Often progressive **macrocephaly**

Early, often major bone damage

Thoracic-lumbar **kyphosis**
Deformed sternum or pectus carinatum, *genu valgum*, short neck
Camptodactyly, clawed fingers, joint stiffness and limitations, Hip dysplasia
Early onset **Carpal Tunnel Syndrome**
wrist and ankle hypermobility (MPS IV)

Skin involvement

Extensive**Mongolian spots** starting in the neonatal period, orange peel skin with "granite" aspect on the shoulder blades and thighs (MPS II)

Morphological damage
becoming more marked with age

Facial dysmorphia: heavy features, frontal bossing, enlarged skull, marked nasal bridge, **wide, upturned nostrils, thick hair,** hypertrichosis, etc...

Oral and dental conditions

Macroglossia, gum hypertrophy, retarded eruption of teeth, dental enamel abnormalities, limited mouth opening, dental cysts and abscesses

ENT and lung impairment
starting from the first months of life

Chronic nasal-pharyngeal congestion, **recurrent ENT infections, mixed** hearing loss, obstructive sleep **apnoea** linked to**amygdala-adenoid hypertrophy**

Chronic **bronchial congestion**, **recurrent chest infections** obstructive and/or restrictive lung disease

Inconstant ophthalmological

Opaque corneas
Retina damage, glaucoma and refractive defects (hyperopia, myopia and astigmatism)

Cardiac impairment

Frequent valve disease sometimes associated with cardiomyopathy, arterial hypertension

Digestive and internal organ damage

Hepatosplenomegaly
Large, recurrent inguinal [2] and/or umbilical hernias
Motility disorders (diarrhoea alternating with constipation)

Neurological impairment
frequent but inconstant,
varies greatly depending on the type

Delayed psychomotor development, intellectual disability
Sometimes, motor and cognitive regression

Behavioural issues, autistic spectrum disorder, sleep disorders (MPS II, III ++)

Hydrocephalus, frequent progressive high (C1-C2) and/or low (at the kyphosis) medulla compression, sometimes acute (quadriplegia, paralysis of the diaphragm)

Specialist workup

Additional tests

X-Rays (Spine, thorax, pelvis, hand):
spinal (platyspondyly, rostrum, ovoid) and chest wall deformities, thoracic-lumbar kyphosis, scoliosis, coxa valga, femoral and acetabular dysplasia, multiple dysostosis, epiphyseal changes, metacarpals appearing to be tapered (licked candy stick deformity), delayed bone age

Additional tests

Complete blood count:
lysosomal storage cells found
in blood smear

Additional tests

Brain and medulla MRI:
dilatation of Virchow-Robin spaces, cerebral atrophy, abnormal white matter, abnormal medulla size

Mucopolysaccharidosis?

Specialist advice from a Centre of Excellence:

Specialist workup
at the same time as looking for other potential differential diagnoses[3]

First-line (quantitative AND qualitative) **urine GAG test**[4]
Specific **enzyme activity assay(s)**
Confirmatory **genetic analysis**

Seek **specialist advice quickly** from a **Centre of Excellence:**
Rare Disease Centre of Reference / Competence: https://www.filiere-g2m.fr/annuaire/

Initial assessment, specialist care, specific treatment (indications, initiation) coordinated by a Centre of Excellence

Genetic counselling, family screening in a specialist centre

For more information: **PNDS French National Authority for Health - Mucopolysaccharidosis (MPS) (has-sante.fr), CETL website**(Lysosomal disease treatment assessment committee: **www.cetl.net**), **protocol for monitored patients** (https://www.filiere-g2m.fr/urgences)

[1] Lysosomal diseases lead to the accumulation of glycosaminoglycans (GAGs) in various organs and tissues. There are several types of MPS depending on symptoms (depending on the enzyme deficiency).
[2] An inguinal hernia in an infant who is not premature should lead to this diagnosis being considered and other signs of MPS should then be sought.
[3] Other neurological/metabolic diseases, particularly Oligosaccharidosis, Mucolipidosis type II/III, constitutional bone diseases, other genetic syndromes, depending on the presentation.
[4] The result may be normal in adults.

Specialist medical opinion and reference laboratory