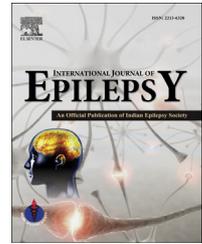


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## Image of the Month

# A child with global neuroregression with refractory epilepsy



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## ARTICLE INFO

## Article history:

Received 9 February 2014

Accepted 28 May 2014

Available online 4 July 2014

## Keywords:

Hypomyelination

Neuroregression

Retinal cherry red spot

Hexosaminidase A

## ABSTRACT

Hypomyelinating disorders have wide spectrum of clinical and radiological manifestations. A 17-month-old girl presented with baseline global developmental delay with insidious onset global neuroregression with refractory seizures from 1 year of age. Her birth and family history were noncontributory. Salient features on examination were central hypotonia and retinal cherry red spot. MRI Brain revealed characteristic white matter and basal ganglia changes. Her serum hexosaminidase A levels were undetectable. Identification of these radiological changes is crucial in directing appropriate enzyme and mutation testing in these patients.

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A 17-month-old female child presented with gradual regression of all milestones and refractory generalized tonic seizures from the age of 1 year. She had global developmental delay since beginning with a developmental age of around 6 months at the age of 1 year. There was no associated paucity of movements, other abnormal involuntary movements, loss of pain sensation or recurrent ulcerations, jerky eye movements or joint deformities. Her antenatal, neonatal and family history was insignificant.

Her central nervous system examination revealed impaired cognition, exaggerated startle, central hypotonia, without any apparent extrapyramidal/sensory/cerebellar signs. Retinal cherry red spot was present without any apparent dysmorphism, skeletal abnormality or organomegaly. She underwent MRI Brain (Fig. 1A and B).

Her serum hexosaminidase A levels were undetectable. A diagnosis of GM2 gangliosidosis was made. Differentiation of the two subtypes (Tay-Sachs and Sandhoff's) of GM2 gangliosidosis is biochemically not possible in the current centre as facility for serum total hexosaminidase levels testing are not available. However in this case the most likely diagnosis is Tay-Sachs as organomegaly is absent.

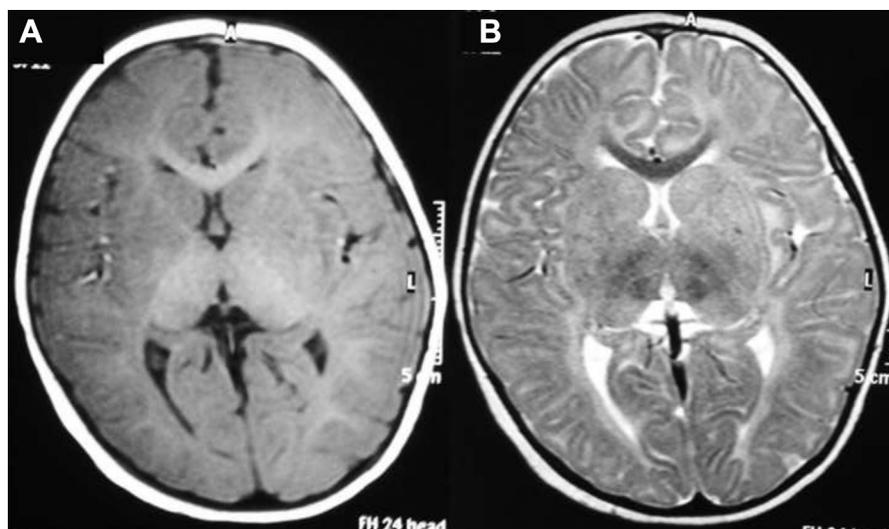
Radiological features help significantly in differentiating between various types of hypomyelinating disorders. The pattern of white matter, cerebellar, basal ganglia and brainstem involvement in T1 and T2 weighted MRI brain images provide clues to the underlying etiology. Hypointense deep and hyperintense subcortical white matter in T1 weighted images is seen in hypomyelination with congenital cataract (HCC) and homogenous T2 hyperintense white matter is seen

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<http://dx.doi.org/10.1016/j.ijep.2014.05.005>

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**Fig. 1 – T1 (A) and T2 (B) weighted axial MR brain images show diffusely swollen bilateral basal ganglia appearing hyperintense on T2 weighted images. The thalami appear mildly hypointense on T2 weighted image. Also note the diffuse hyperintense signal on bilateral white matter on T2 weighted images and the corresponding mildly hyper to isointense white matter on T1 weighted images consistent with hypomyelination.**

in Pelizaeus–Merzbacher disease (PMD). Characteristic basal ganglia findings are pathognomonic for certain hypomyelinating disorders. GM1 and GM2 gangliosidosis are characterized by swollen and T2 hyperintense basal ganglia, fucosidosis has T2 hypointense globus pallidus and putamen is atrophied in hypomyelination with atrophy of basal ganglia and cerebellum (H-ABC).<sup>1</sup> Cerebellar atrophy without putaminal involvement is seen in 4H (hypomyelination, hypodontia and hypogonadotropic hypogonadism) syndrome whereas T2 hyperintense pons is seen in Pelizaeus–Merzbacher-like disease (PMLD).

In GM2 gangliosidosis the radiological changes are described in three phases. Initially there is enlargement with abnormal signal changes of basal ganglia (particularly caudate) followed by features of hypomyelination with diffuse cerebral atrophy in the terminal stages.<sup>2,3</sup>

Clinically patients with classic GM2 gangliosidosis present with infantile onset psychomotor regression, hyperacusis, macular cherry red spot, central hypotonia and blindness. As the disease progresses megalencephaly and generalized seizures are seen. Sandhoff's disease in addition exhibits hepatosplenomegaly and cardiomyopathy. Late onset variants are characterized by neuropsychiatric manifestations, seizures, dysarthria, spastic paraparesis and peripheral neuropathy.<sup>4</sup> The current case fits into the clinical description of a classic infantile Tay-Sachs disease.

Radiologically GM1 and GM2 gangliosidosis are indistinguishable.<sup>1</sup> However absence of dysmorphic and skeletal

features differentiates the latter from former. Certain clinical features like retinal cherry red spot and exaggerated startle are seen in both. Retinal cherry red spot may not be seen in all patients. On the other hand retinal cherry red spot can be seen in other disorders as well.<sup>4</sup> Thus pathognomonic MRI findings can help in directing appropriate enzyme testing and mutation analysis in these group of disorders.

### Conflicts of interest

All authors have none to declare.

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