Case Report

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A Clinical Diagnostic Dilemma in Mucopolysaccharidosis

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Abstract

Mucopolysaccharidoses (MPS) are progressive diseases that are hereditary and are caused by mutations of genes coding for lysosomal enzymes needed for stepwise degradation of glycosaminoglycans GAGs.[1] There are 11 known enzyme deficiencies which give rise to seven MPS types. Hunter disease or mucopolysaccharidosis-II is an X linked recessive disease and is due to deficiency of iduronate 2 sulfatase. This in turn leads to accumulation of glycosoaminoglycans (GAG), dermatan and heparan sulfate. The intracellular and extracellular accumulation of these substances leads to multisystem abnormality. A 7 year old male child came with clinical features of MPS but the type of MPS was difficult to ascertain clinically. The genetic study confirmed it to be Hunters disease or MPS type II. The clinical features of MPS are overlapping therefore genetic studies to confirm the diagnosis become essential to give appropriate enzyme replacement therapy.

Keywords: Hunter disease; Mucopolysaccharidosis; MPS type II.

Introduction

MPS are multisystemic disorders that affect several organ systems in individually variable degree. Mucopolysaccharidosis type II (MPS II), Hunter disease, is an X-linked, recessive disease which is characterized by decrease in the activity of the lysosomal enzyme Iduronate-2-sulfatase (I2S), due to a mutation in the I2S gene.[2,3] It is a rare disease with a worldwide prevalence of 1 in 1,40,000–1,56,000 live births.[4] It is a disorder affecting multiple systems with patients exhibiting coarse facial features, bone and joint abnormalities, short stature, and pathological changes in the heart, respiratory system, hearing, and vision.[3] Severely affected patients have profound neurological involvement, with progressive learning difficulties and behavioural abnormalities, as well as disturbed motor function.

Characteristic features of MPS II include coarse facies, a large head, large tongue, tonsillar and adenoids hypertrophy, misaligned irregularly shaped teeth, recurrent otitis media, a distended abdomen due to hepatosplenomegaly, abdominal and/or inguinal hernias, and thickened pebbled skin.[4] Literature documents survive up to 87 years with mild variants.[4]

Case Report

A 7-year-old boy was referred in view of dysmorphism, intellectual disability and history of poor school performance. He is the first child born of a non-consanguineous marriage. The antenatal, perinatal and neonatal periods were uneventful. There was no significant family history of recurrent respiratory tract infections or any cardiovascular

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complaints. Milestones were achieved late and the boy started to walk at 2.5 years of age and speaking 1–2 word sentences at 5 years of age. There was global developmental delay with delay predominantly in gross motor, language and the social domains.

On examination, he had coarse facies, dolicocephalic skull, short stature, thick lips, mal-aligned teeth and short stubby fingers. There was no hepatosplenomegaly, thick protruding tongue or corneal clouding. Intellectual disability was present and IQ test was advised. There was no limitation in the range of motion or any deformities. History and clinical examination was suggestive of mucopolysaccharidosis (MPS) with overlap of features between type I, II and IV. On investigations it was revealed that the child had Hunter disease-MPS type II.

On Investigations-Urine for GAG (electrophoresis) was elevated 54.4 (dermatan sulphate > heparan sulphate > chondroitin sulphate). Genetic study revealed deficiency of iduronate 2 sulphate sulfatase. Ophthalmologic evaluation revealed-hypermetropia. There was bilateral moderate conductive hearing loss and 2D Echo which suggested that he had trivial tricuspid regurgitation.

Discussion

Mucopolysaccharidosis has a wide clinical spectrum ranging across the multiple types of MPS, the clinical features of which often overlap making a definitive clinical diagnosis difficult.

In our patient, initially MPS I was suspected in view of the coarse facies, short stature and mental retardation but the absence of corneal clouding and hepatosplenomegaly was against this diagnosis.

MPS IV has features of short stature and organomegaly and is not usually seen with very fine corneal deposits, but they have preserved intelligence which was not the case with our patient.

Features of MPS II such as coarse facies, short stature, and lack of corneal clouding were present in our patient but there were no skin papules or dysostosis multiplex which is seen in MPS II. Also, MPS II has mild or no mental deficiency.

Therefore, an overlap of clinical features between type I, II and IV was seen. Genetic study confirmed the diagnosis revealing a deficiency of Iduronate-2-sulfatase which is suggestive of MPS II or Hunter disease.

Enzyme replacement therapy (ERT) is an important new therapy that has the potential to help many patients, provided it is started early in the course of disease. Idursulfase (Elaprase) is recombinant form of human 2-sulfatase and has been approved for treatment. This ERT was advised for our patient but was lost to follow up.

Conclusion

The clinical features of the different types of mucopolysaccharidosis often overlap and hence making a definitive clinical diagnosis is difficult. Enzyme replacement therapy with that particular deficient enzyme may reduce complications and can greatly improve quality of life. Early diagnosis is therefore of utmost importance.

References

1. Beck M. Therapy for lysosomal storage disorders. IUBMB Life. 2009;62:33–40.
2. Bach G, Eisenberg F, Cantz M, *et al*. The Defect in the Hunter Syndrome: Deficiency of Sulfoiduronate Sulfatase. Proceedings of the National Academy of Sciences. 1973;70(7):2134–38.
3. Harper P, CR Scriver, AL Beaudet, *et al*. Molecular and metabolic bases of inherited disease, 8th edition. Human Genetics. 2002;110(2):205–06.
4. Scarpa M, Almassy Z, Beck M, *et al*. Mucopolysaccharidosis type II: European recommendations for the diagnosis and multidisciplinary management of a rare disease. Orphanet Journal of Rare Diseases. 2011;6(1):72.