Because every minute counts

An overview of Molybdenum Cofactor Deficiency (MoCD)

MoCD is a very rare, genetic, neurological disorder that often presents within hours to days following birth. There are 3 types of MoCD: A, B, and C, which can be confirmed by genetic testing. Type A is the most common and is found in two-thirds of patients.[1,2] All 3 types of MoCD commonly present with intractable seizures, feeding difficulties, high-pitched cries, exaggerated startle reactions, and hypertonia/hypotonia.[1-4] Progression is rapid with a high infant mortality rate. Those who survive beyond the first few months without treatment often have severe developmental delays.[1,4,5]

MoCD results from a genetic mutation, for Type A in the MOCS1 gene, that leads to the inability of newborns to produce an essential substance called molybdenum cofactor (MoCo).[1,6] MoCo, a complex of molybdenum and molybdopterin, is essential for the function of sulfite oxidase (SOX), xanthine oxidase, aldehyde oxidase, and mitochondrial amidoxime-reducing component.[7,8] The absence of MoCo inactivates all 4 of these enzymes, which causes sulfite toxicity in the brain and other biochemical abnormalities.[1,3,4]

Act quickly and be the first line of defense by following the STAT approach:

- **S** See a seizure?
- **T** Think MoCD.
- **A** Assess for sulfites.
- **T** Time to call Origin Biosciences.

Contact Origin Biosciences at (617) 322-5165 to learn about an investigational treatment* for MoCD Type A.

*The safety and efficacy has not been established.

After a neonatal seizure, consider MoCD

Use the diagnostic checklist below to differentiate MoCD from HIE and other neonatal neurological disorders

Watch for early symptoms[1,4,7]:

- ◯ Intractable seizures
- ◯ Feeding difficulties
- ◯ High-pitched cries
- ◯ Exaggerated startle reactions
- ◯ Hypertonia/hypotonia

Symptom presentation can vary. Note that a normal or uneventful delivery may also help differentiate MoCD from HIE.[1-4,7,9]

Assess for sulfites and other key biomarkers[1]:

- ◯ Elevated sulfites in urine
- ◯ Elevated S-sulfocysteine (SSC)
- ◯ Low or undetectable uric acid
- ◯ Purines & pyrimidines panel (blood or urine test)
  - – High levels of xanthine and hypoxanthine

Confirm diagnosis with a genetic test:

- ◯ MoCD Type A results from a defect in the **MOCS1 gene**[1]
  - – Other sulfite intoxication disorders can be caused by mutations in MOCS2, MOCS3, GPHN, and SUOX[1,10,11]

Rapid turnaround time is critical.

Contact Origin Biosciences at (617) 322-5165 to learn about an investigational treatment* for MoCD Type A.

*The safety and efficacy has not been established.
HIE=hypoxic-ischemic encephalopathy.

References: **1.** Mechler K et al. *Genet Med*. 2015;17(12):965-970. **2.** Veldman A et al. *Pediatrics*. 2010;125(5):e1249-e1254. **3.** Durmaz MS et al. *Radiol Case Rep*. 2018;13(3):592-595. **4.** Schwahn BC et al. *Lancet*. 2015;386(10007):1955-1963. **5.** Atwal PS et al. *Mol Genet Metab*. 2016;117(1):1-4. **6.** National Institutes of Health. Molybdenum cofactor deficiency. https://ghr.nlm.nih.gov/condition/molybdenum-cofactor-deficiency. Accessed February 28, 2019. **7.** Hitzert M et al. *Pediatrics*. 2012;130:e1005-e1010. **8.** Schwarz G et al. *Nature*. 2009;460(7257):839-847. **9.** Allen KA et al. *Newborn Infant Nurs Rev*. 2011;11(3):125-133. **10.** National Institutes of Health. Isolated sulfite oxidase deficiency. https://ghr.nlm.nih.gov/condition/isolated-sulfite-oxidase-deficiency#genes. Accessed August 21, 2019. **11.** Huijmans JGM et al. *Am J Med Genet*. 2017;173(6):1601-1606.

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