Test Definition: SORBU

Sorbitol and Mannitol, Quantitative, Random, Urine

Overview

Useful For

Monitoring effectiveness of treatment in patients with phosphomannomutase 2 deficiency (PMM2-CDG)

Establishing a baseline level prior to initiating treatment for PMM2-CDG

This test is **not useful for** diagnosing congenital disorders of glycosylation (CDG) in general or PMM2-CDG in particular

Method Name

Gas Chromatography Mass Spectrometry (GC-MS)

NY State Available

Yes

Specimen

Specimen Type

Urine

Ordering Guidance

This is the preferred test for monitoring effectiveness of treatment in patients with phosphomannomutase 2 deficiency (PMM2-CDG). The preferred test for assessing sorbitol dehydrogenase (SORD) deficiency-related peripheral neuropathy is SORD / Sorbitol and Xylitol, Quantitative, Random, Urine

Necessary Information

Patient's age is required.

Specimen Required

Supplies: Urine Tubes, 10 mL (T068)
Container/Tube: Plastic, 10-mL urine tube
Specimen Volume: 2 mL
Collection Instructions:
1. Collect a random urine specimen.
2. No preservative.

Forms

If not ordering electronically, complete, print, and send a Biochemical Genetics Test Request (T798) with the specimen.

Specimen Minimum Volume

1 mL

Reject Due To

All specimens will be evaluated at Mayo Clinic Laboratories for test suitability.

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Urine	Refrigerated (preferred)	28 days	
	Frozen	28 days	

Clinical & Interpretive

Clinical Information

Phosphomannomutase 2 deficiency, or PMM2-CDG, is the most common congenital disorder of glycosylation (CDG) accounting for about 50% of known CDG patients.

In many patients with PMM2-CDG, the urine polyols, sorbitol and mannitol, are elevated relative to controls. Sorbitol, in particular, has been shown to be positively correlated with severely affected patients in contrast to patients in the mild or moderate categories. It is also higher in patients with moderate peripheral neuropathy. Both mannitol and sorbitol were increased in patients with mild liver dysfunction.(1) Treatment options for PMM2-CDG remain limited however; current literature reports that the aldose reductase inhibitor, epalrestat, can correct the underlying enzyme deficiency in a majority of patients with PMM2-CDG.(2) Recent trials suggest that treatment with epalrestat, in addition to other therapeutic benefits, resulted in nearly normalized levels of sorbitol and mannitol relative to controls.(1)

Reference Values

Mannitol: <97 mmol/mol creatinine
Sorbitol: <35 mmol/mol creatinine

Interpretation

The quantitative results of sorbitol and mannitol are reported without added interpretation.

Cautions

No significant cautionary statements

Clinical Reference

1. Ligezka AN, Radenkovic S, Saraswat M, et al. Sorbitol is a severity biomarker for PMM2-CDG with therapeutic implications. Ann Neurol. 2021;90(6):887-900. doi:10.1002/ana.26245
2. Iyer S, Sam FS, DiPrimio N, et al. Repurposing the aldose reductase inhibitor and diabetic neuropathy drug epalrestat for the congenital disorder of glycosylation PMM2-CDG. Dis Model Mech. 2019;12(11):dmm040584. doi:10.1242/dmm.040584
3. Radenkovic S, Ligezka AN, Mokashi SS, et al. Tracer metabolomics reveals the role of aldose reductase in glycosylation. Cell Rep Med. 2023;4(6):101056. doi:10.1016/j.xcrm.2023.101056

Performance

Method Description
A total of 200 mcL of urine is spiked with a mixture of labeled internal standards, allowed to equilibrate, and evaporated. The dry residue is derivatized to form trimethylsilyl esters, then extracted with hexane. Specimens are analyzed by gas chromatography mass spectrometry, selected ion monitoring using ammonia chemical ionization and a stable isotope dilution method.(Jansen G, Muskiet F, Schierbeek H, et al. Capillary gas chromatography profiling of urinary, plasma, and erythrocyte sugars and polyols as their trimethylsilyl derivatives, preceded by a simple and rapid prepurification method. Clin Chim Acta. 1986;157[3]:277-294; Marolt G, Kolar M. Analytical methods for determination of phytic acid and other inositol phosphates: A review. Molecules. 2020;26[1]:174)

PDF Report
No

Day(s) Performed
Tuesday, Friday

Report Available
3 to 7 days

Specimen Retention Time
3 months

Performing Laboratory Location
Mayo Clinic Laboratories - Rochester Main Campus

Fees & Codes

Fees
- Authorized users can sign in to Test Prices for detailed fee information.
- Clients without access to Test Prices can contact Customer Service 24 hours a day, seven days a week.
- Prospective clients should contact their account representative. For assistance, contact Customer Service.

Test Classification
This test was developed and its performance characteristics determined by Mayo Clinic in a manner consistent with CLIA requirements. It has not been cleared or approved by the US Food and Drug Administration.

CPT Code Information
82542

LOINC® Information

MAYO CLINIC LABORATORIES

Test Definition: SORBU

Sorbitol and Mannitol, Quantitative, Random, Urine

Test ID	Test Order Name	Order LOINC® Value
SORBU	Sorbitol and Mannitol, QN, U	74447-4

Result ID	Test Result Name	Result LOINC® Value
614935	Sorbitol	48152-3
614936	Mannitol	47698-6
614937	Interpretation	59462-2
614938	Reviewed By	18771-6