Neurotransmitter Report; urine

Order: 000000-1036
Client #: 12345
Doctor: Sample Doctor, MD
Doctor's Data, Inc.
3755 Illinois Ave.
St. Charles, 60174 IL

Patient: Sample Report
Age: 34 **DOB:** 04/18/1984
Sex: Female
Body Mass Index (BMI): 19.2

Sample Collection	Date/Time
Date Collected	04/18/2018
Wake Up Time	0800
Date Received	04/19/2018
Date Reported	04/19/2018

Analyte	Result	Unit per Creatinine	L WR H	Reference Interval
Serotonin	54.22	µg/g		52 - 155
Gamma-aminobutyrate (GABA)	1.8	nmol/g		1.6 - 8
Dopamine	135	µg/g		95 - 275
Norepinephrine	30.22	µg/g		15 - 78
Epinephrine	1.25	µg/g		1 - 11.1
Glutamate	50.65	nmol/g		10 - 52
Glycine	3600	nmol/g		350 - 3500
Histamine	22.15	µg/g		12 - 66
Phenethylamine (PEA)	11.9	nmol/g		20 - 176
Norepinephrine / Epinephrine ratio	24.2			< 11
Creatinine	194.49	mg/dL		

Neurotransmitter Comments:

- Urinary neurotransmitter levels provide an overall assessment of the body's ability to make and break down neurotransmitters and are representative of whole body levels. They are required for neurotransmission throughout the body. Direct assessment of neurotransmitter levels and metabolism in the central nervous system is not clinically feasible and approximately twenty percent of the total urinary levels are derived from the brain. The enzymes, cofactors and precursors in neurotransmitter metabolism in general are the same in the periphery and in the central nervous system. Therefore, alterations in urinary neurotransmitter levels assessed in urine provide important clinical information, and may be associated with many symptoms including cognitive and mood concerns, diminished drive, fatigue and sleep difficulties, cravings, addictions and pain.
- Low range serotonin may contribute to mood concerns including anxiety, OCD, depression, anger and a sense of discontentment. Low serotonin may also be associated with poor sleep quality and appetite changes, chronic fatigue and rheumatoid arthritis, and over-all lassitude. Production of serotonin requires vitamin D, tetrahydrobiopterin, iron and vitamin B6. Tryptophan is the essential precursor of serotonin. 5-HTP may increase serotonin and L-theanine may affect serotonin function.
- Low range GABA may be associated with anxiety, poor impulse control, depression, pain and decreased sleep quality. Low GABA may be seen in individuals deficient in vitamin B6. L-theanine, GABA and glutamine may positively affect functional GABA activity, and phenibut exerts GABA-like effects (experimental models).
- Low range epinephrine may be associated with depression and mood changes as well as fatigue, difficulty concentrating, decreased ability to stay focused on tasks and diminished sense of personal/professional drive. Conversion of epinephrine from norepinephrine requires SAMe and adequate cortisol. L-tyrosine is an amino acid precursor., L-theanine and Mucuna pruriens may modulate epinephrine signaling.
- Upper range glutamate may contribute to anxiety, poor concentration, attention deficits and hyperactive tendencies as well as poor sleep and nighttime awakening. Glutamate may be increased in association with hypoglycemia, Alzheimer's, ALS and chronic compromised blood flow to the brain. Possible sources of increased glutamate include MSG, yeast extract and other hidden sources of free glutamic acid. L-theanine may modulate elevated glutamate levels and attenuate glutamate signaling, and taurine may provide protection from excitotoxicity and neuroinflammation.
- Elevated glycine levels may be associated with diminished intellectual functioning and adaptive behavior. Elevated levels may be seen with glycine supplementation, often used in conjunction with pharmaceutical agents when supporting schizophrenia or psychosis. Lipoic acid may enhance glycine break down. Break down of glycine requires vitamin B6 and tetrahydrofolate as cofactors. Note: High levels of glycine may interact with clozapine and decrease its clinical efficacy.
- Low phenethylamine (PEA) may be associated with depression, attention deficits and hyperactivity (ADHD), Parkinson's disease and bipolar disorder. Phenylalanine is the precursor amino acid to PEA, and vitamin B6 is a required co-factor in the conversion to this primary trace amine. Use of Reserpine can result in depletion of PEA.
- Elevated N/E ratio is consistent with poor conversion of norepinephrine to epinephrine. This conversion is driven by the phenylethanolamine N-methyltransferase (PNMT) enzyme that requires SAMe, magnesium and cortisol (adequate HPA axis function) as cofactors. Suggest interpretation in context of cortisol levels/HPA axis function, with subsequent optimization of HPA axis function when clinically warranted.
- Considerations to address the demonstrated imbalances beyond the identified co-factors and amino acid precursors may include dosage adjustments if indicated, as well as nervine and adaptogenic herbs, methylation support, vitamin D, and gastrointestinal health optimization.

Notes:
L (blue)= Low (below range), WR (green)= Within Range (optimal), WR (yellow)= Within Range (not optimal) H (red)= High (above range)
Methodology: LCMS QQQ,Creatinine by Jaffe Reaction

Analyzed by DOCTOR'S DATA, INC. • 3755 Illinois Avenue, St. Charles, IL 60174-2420 USA • LAB DIR: Erlo Roth, MD • CLIA ID: 14D0646470