Neurotransmitter Report; urine

LifeExtension® National Diagnostics, Inc.

Order: 170101-0001
Client #:
Doctor:

Patient: Sample Patient
Age: 43 **DOB:** 01/01/1974
Sex: Female
Body Mass Index (BMI): 19.6
Menopausal Status:

Sample Collection	Date/Time
Date Collected	01/01/2017
Wake Up Time	0800
Date Received	01/04/2017
Date Reported	01/06/2017

Analyte	Result	Unit per Creatinine	L WR H	Reference Interval
Serotonin	48.7	µg/g		52 - 155
Gamma-aminobutyrate (GABA)	1.5	µmol/g		1.6 - 8
Dopamine	75.2	µg/g		95 - 275
Norepinephrine	13.4	µg/g		15 - 78
Epinephrine	16	µg/g		1 - 11.1
Glutamate	64	µmol/g		10 - 52
Glycine	3600	µmol/g		350 - 3500
Histamine	4.3	µg/g		12 - 66
Phenethylamine (PEA)	12	µmol/g		20 - 176
Norepinephrine / Epinephrine ratio	0.85			< 11

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 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. as well as chronic fatigue, 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 GABA may be associated with anxiety, poor impulse control, major 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 dopamine levels may be associated with anxiety/depression, difficulty concentrating, obesity, reduced social bonding, and other stimulation seeking activities. Production of dopamine requires vitamin D, tetrahydrobiopterin, iron and vitamin B6. L-tyrosine, L-theanine and Mucuna pruriens may influence dopamine signaling.
- Low norepinephrine 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. Norepinephrine is converted from dopamine requiring vitamin C, copper and B3, and L-tyrosine is an amino acid precursor. L-theanine and Mucuna pruriens may modulate norepinephrine effects.
- Elevated epinephrine may be associated with stress response and contributory to anxiety, agitation, irritability, insomnia and hypertension. Epinephrine levels may be elevated in patients in association with exercise prior to the urine collection. Metabolism of epinephrine requires vitamins B2, B3, SAMe, magnesium, and iron. L-theanine may modulate epinephrine effects.
- Elevated 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 histamine may affect digestion and appetite control, learning, memory, and mood, and may result in drowsiness. Histamine has been noted to modulate neurotransmitter release from neurons. Histamine levels may be supported by consumption of high-protein foods and whole grains, as well as L-histidine supplementation. Vitamin B6 is a cofactor for histamine synthesis.
- 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.
- 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.
- Note: The reported low to low range monoamine neurotransmitters may be associated with genetic disruptions in methylation and/or suboptimal quantities of required co-factors. Further testing may be warranted.

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