DEPRESSION

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Depression Database

- More than 3,000 patients diagnosed with clinical depression,
- > 250,000 assays of blood and urine,
- 50 to 150 symptoms or traits recorded for each patient.

Database Studies

A wide range of abnormal chemistries and behaviors were observed in the depressive population.

5 chemical classifications (phenotypes) were identified, representing 95% of depressives.

Distinctive symptoms and traits were identified for each depression group.

Chemical Classification of Depression

38% Undermethylation

20% Folate Deficiency

17% Copper Overload

15% Elevated Pyrroles

5% Toxic Metal Overload

Implications of Database Findings

- Depression is a name given to a variety of different mood disorders.
- Each depression phenotype has unique chemical imbalances and symptoms.
- Different treatment approaches are needed for these disorders.

A 25-Year Mystery!

- Folic Acid is a very-effective methylating agent.
- Undermethylated depressed patients are intolerant to folates.
- Overmethylated depressives thrive on folates.

WHY?

Mystery Solved by Epigenetic Science

- Folic Acid generates acetylase enzymes that alter histones & promote expression of SERT.
- SERT increases serotonin reuptake, thus reducing serotonin activity.
- For low-serotonin depressives, the harmful impact of folic acid at the synapse exceeds the benefits of normalizing methylation.

Epigenetics of Methyl and Folate

- SAMe modifies histones to block production of transporter proteins: This reuptake inhibition increases activity of serotonin & dopamine.

- Folates have the opposite effect on histones and lower serotonin and dopamine activity.

Nutrients That Increase Serotonin Neurotransmission

- S-Adenosyl Methionine (SAMe)
- Methionine
- Tryptophan
- 5-HTP

Nutrients That Decrease Dopamine Neurotransmission

- Folic Acid
- Niacin or Niacinamide
- DMAE or Choline
- Manganese

Nutrients That Decrease Norepinephrine Neurotransmission

- GABA
- Folic Acid
- Niacin or Niacinamide
- Pantothenic Acid
- Zinc

Five Depression Phenotypes

1. Undermethylation
2. Low Folate
3. Copper Overload
4. Pyrrole Disorder
5. Toxic Metal Overload

Phenoptype #1
Undermethylated Depression

- Elevated Blood Histamine
- Low SAMe/SAH Ratio
- Low Basophils
- Low Serotonin Activity

Symptoms & Traits Undermethylated Depression

- OCD tendencies
- Seasonal affective disorder
- Competitive & perfectionistic
- SSRI medications usually effective
- Calm exterior, but inner tension
- Strong willed
- High libido
- Seasonal allergies

Useful Nutrients Undermethylated Depression

- SAMe
- Methionine
- Calcium
- Magnesium
- Zinc,
- Trimethylglycine (TMG)
- Vitamins B-6, C, E
- Inositol

Phenotype #2
Low-Folate Depression

- Low Serum Folates
- Low Blood Histamine
- Elevated SAMe/SAH Ratio
- Elevated Dopamine & Norepinephrine

Symptoms and Traits of Low-Folate Depression

- Tendency for high anxiety, panic
- Non-competitive in sports or games
- Absence of inhalent allergies
- Food/chemical sensitivities
- Adverse reaction to SSRI medications
- High musical or artistic ability
- Underachievement
- Sleep disorder
- Low libido

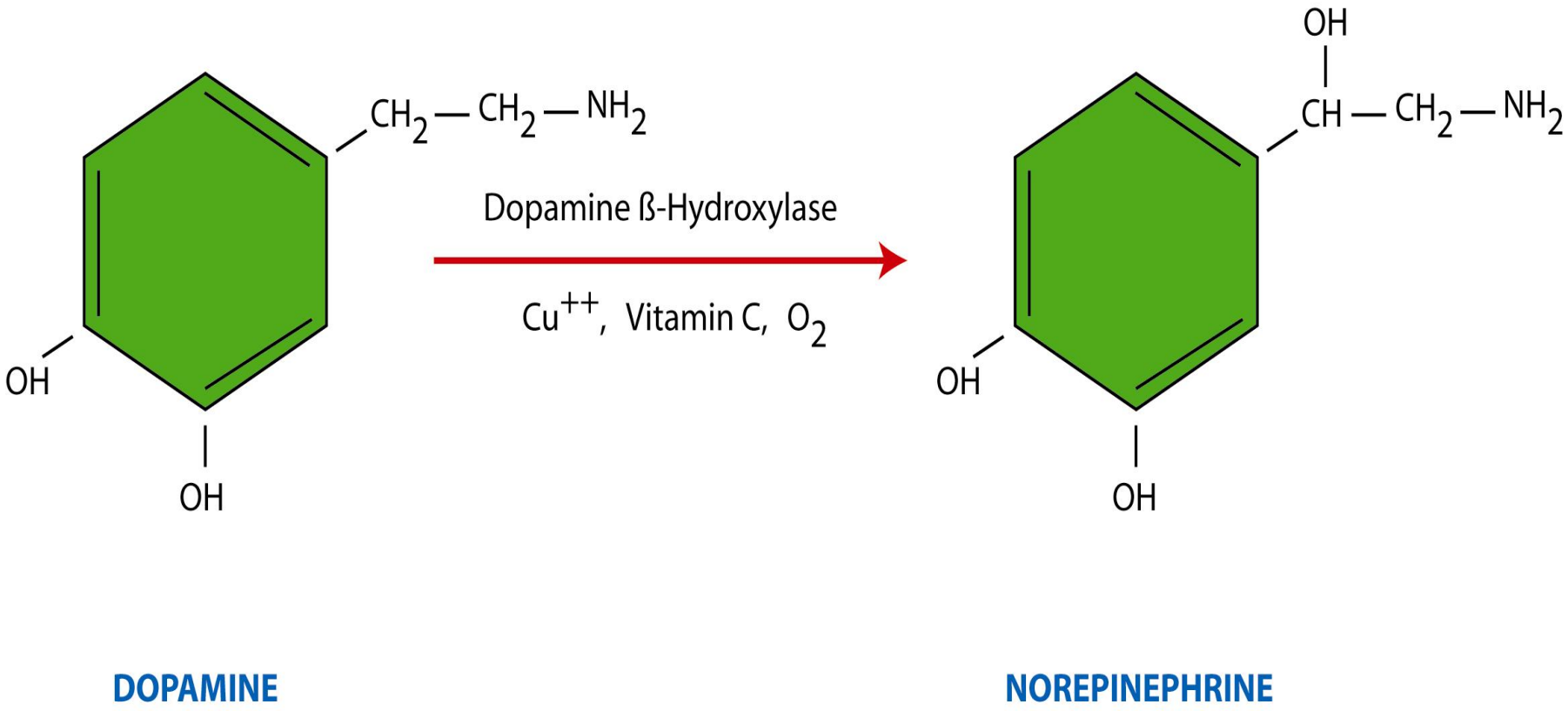
Useful Nutrients For Low-Folate Depression

- Folic Acid
- B-12
- GABA
- DMAE
- Manganese
- Niacin or Niacinamide
- Vitamins A, B-6, C, E
- Zinc

Phenotype #3
High-Copper Depression

- Elevated Serum Copper
- Insufficient Serum Ceruloplasmin
- Zinc Depletion
- Low Metallothionein Activity
- Elevated Norepinephrine & Adrenaline

Norepinephrine Synthesis



Symptoms and Traits of High-Copper Depression

- More than 95% are female
- Inability to eliminate excess copper
- High anxiety
- Tendency for post-partum depression
- Onset during hormonal event (puberty, birth control, pregnancy, menopause)
- Estrogen intolerance
- Tinnitis (ringing in the ears)
- Sensitive skin, intolerance to cheap metals.

Useful Nutrients for High-Copper Depression

- Zinc
- Vitamin B-6
- MT-Promotion Nutrients
- Manganese (avoid if undermethylated)
- Selenium
- Vitamin C
- Vitamin E

Decoppering Protocol Issues

- The excess copper departs via the blood stream.
- Gradual introduction of zinc is recommended to minimize copper elevations in blood & increased irritability and anxiety during early treatment.
- Zinc dosages should be increased to tolerance.

Depression Phenotype #4
Pyrrole Disorder

- Elevated urine pyrroles
- Zinc deficiency
- Vitamin B-6 deficiency
- Severe oxidative stress
- Low serotonin & GABA

Pyrrole Depression

- Severe mood swings
- Poor stress control
- Extreme anxiety
- Poor short-term memory, reading disorder, absence of dream recall
- Sensitivity to light, noise
- Poor immune function
- Very poor morning appetite
- Abnormal fat distribution,
- Inability to tan.

Treatment of Pyrrole Disorder

- Zinc Therapy
- Supplements of B-6, P-5-P
- Omega-6 (Primrose Oil, Borage Oil)
- Biotin

Toxic Metal Depression

- Absence of trauma or emotional triggers
- Abdominal distress
- Unrelenting depression
- Cognitive deficits (children only)
- Metallic taste in mouth, bad breath
- Irritability, anger
- Food sensitivities
- High oxidative stress

Useful Nutrients: Toxic Metal Depression

- Zinc
- Manganese
- Glutathione
- Selenium
- MT-Promotion Nutrients
- Calcium (lead poisoning)
- Vitamin C
- Vitamin E

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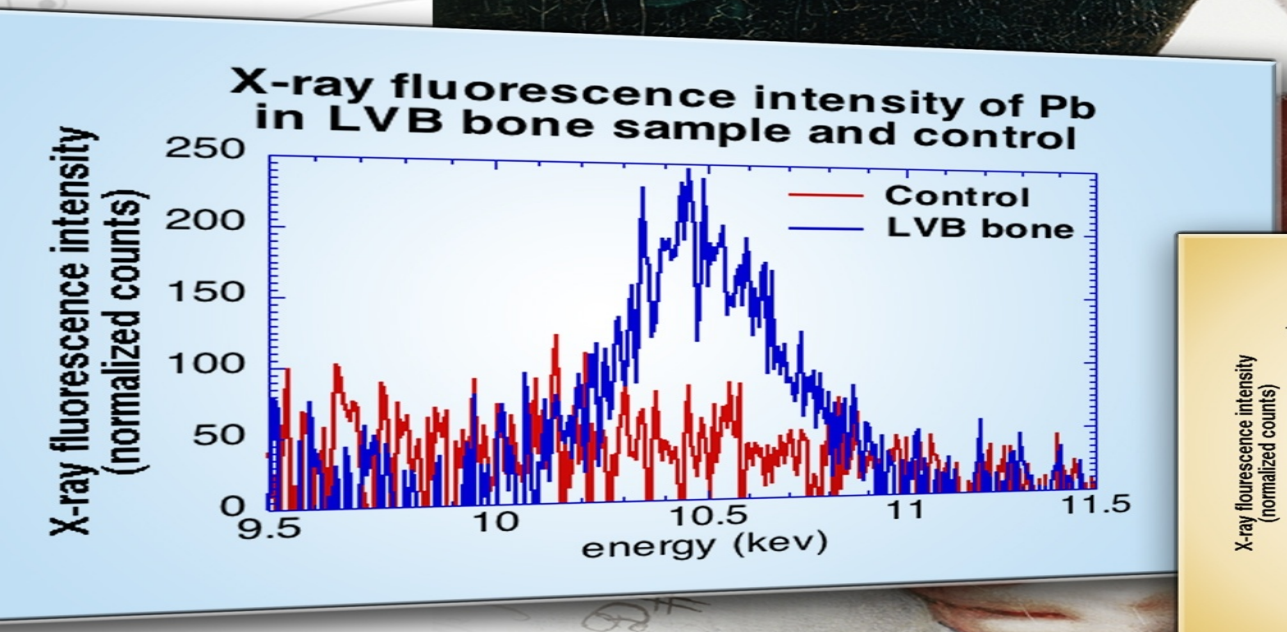
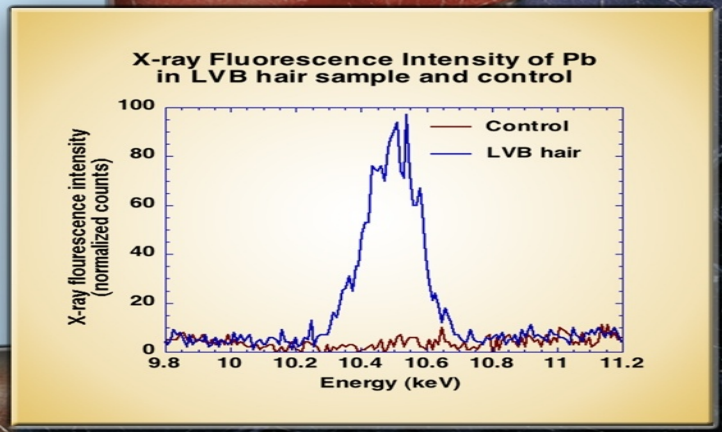
LEAD LEVELS IN BEETHOVEN SAMPLES





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Open-Label Outcome Studies

- 20% non-compliance rate
- 85% of compliant patients report improvement and reduced medication needs
- Many reports of zero depression without medication support.

Treatment Time Frames

- Pyrrole Disorder: 1-4 weeks to achieve full effect.
- Copper Overload: No progress until week 3; 60-90 days to normalize blood Cu levels.
- Low Folates: Clear improvement by week 4; 3-6 months to achieve full effect.
- Undermethylation: No progress until month 2; 6-12 months to achieve full effect.

THANK YOU!

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