Nutrient Therapy for ADHD and Behavior Disorders

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EARLY RESEARCH

1. Prison volunteer work involving close contact with ex-convicts & families.
2. Many parents reported an abnormal infancy and troubled childhood: rages, violence, animal torture, fascination with weapons.
3. Some parents of criminals seemed capable & caring, and had other children who were well-adjusted, productive citizens.
Question: What is the Cause of a Severe Behavior Disorder?

- Tabula rasa (blank slate) theory: dominance of life experiences,
- Adoption & twin studies (1970’s) indicate genetic predisposition for schizophrenia, bipolar disorder, clinical depression, autism,
- New research focus on neurotransmitters, receptors, drug medications,
- Argonne initiates studies of body chemistry for convicted felons.
Metal-Metabolism Abnormalities

- Study of death row residents & other convicted murderers indicates unusual levels of Cu, Zn, Mn, Na, K, Li, Co.
- Similar chemical imbalances found in violent children.
- Formal experiments initiated at Argonne National Laboratory.
Sibling Experiment

**Test Group**
- 24 violent males
- Age range: 8-18 years
- Multiple violent incidents

**Control Group**
- 24 brothers, living in same domicile
- Age range: 8-18 years
- No violence or delinquency
Results of Sibling Experiment

- Most controls exhibited expected levels of metals; Most violent subjects had abnormal levels of Cu, Zn, Mn, Pb, Cd, Na, K, Ca.

- Two distinctive patterns of trace metals observed in violent subjects:
  -- Type A: Elevated Cu, Cd, Pb
      Depressed Zn, Na, K, Li, Co
  -- Type B: Elevated Na, K, Cd, Pb, Mn
      Depressed Cu, Zn, Li, Co
Family Survey of Violent Siblings

Type A Subjects: Episodic violence, genuine remorse, high incidence of ADHD, LD, and academic underachievement.

Type B Subjects: Oppositional, defiant, cruel, assaultive, high pain threshold, fascination with fire, weapons.
Double-Blind Field Test (n=192)

**Test Group:** 96 extremely violent prison residents, ex-convicts, and assaultive children.

**Controls:** 96 non-violent males, matched for age and socioeconomic level in childhood.
Field Test Results

- Results of sibling experiment confirmed

- Type A & B patterns predominate in violent cohort; Most controls exhibit expected trace metal levels.

- $P < 0.001$

**Conclusion:**
Most violent persons exhibit abnormal metal metabolism
Additional Trace Metal Patterns Observed in Delinquent Children

**Pattern C:**
Depressed Ca, Mg, Zn, Cu, Mn, Cr, Fe, Na, K  
High incidence of malabsorption  
Impulsive, non-violent delinquency.

**Pattern D:**
Elevated Ca, Mg; Depressed Zn, Cu, Mn, Na, K  
Severe reaction to sugar, caffeine  
Academic underachievement  
Non-violent delinquency.
**Type A**: Elevated Cu/Zn ratio in blood, high toxic metals, histamine disorder, hypoglycemia, 30% have pyrrole disorder.

**Type B**: Combination of high blood histamine, low blood spermine, pyrrole disorder, hypoglycemia, elevated toxic metals.

**Type C**: Malabsorption

**Type D**: Hypoglycemia
Forensics Cases

- James Oliver Huberty
- Charles Manson
- Richard Speck
- Patrick Ryan
- Patrick Sherrill
- Ludvig van Beethoven
- Twenty other notable cases
Examples of Forensics Findings

- Charles Manson: Severe Type B chemistry
- James Huberty: Cd poisoning; mild Type B
- Richard Speck: Severe Type A chemistry
- Patrick Ryan: No abnormalities detected
- Patrick Sherrill: Pb poisoning, Type A
- Beethoven: Severe Pb poisoning.
Welcome to the Advanced Photon Source
LEAD LEVELS IN
BEETHOVEN SAMPLES

X-ray fluorescence intensity of Pb in LVB bone sample and control

X-ray fluorescence intensity of Pb in LVB hair sample and control

Argonne National Laboratory is managed by The University of Chicago for the U. S. Department of Energy
Clinical Populations

- 10,000 Behavior & ADHD
- 4,600 Autism
- 3,500 Schizophrenia & Bipolar
- 3,200 Depression
Individualized Nutrient Therapy

Medical History and Review of Symptoms
Extensive Chemical Testing
Diagnosis of Chemical Imbalances
Prescribed Nutrient Program

Note: Best results for younger patients
Walsh Chemistry Database

- World’s largest chemistry database for behavior disordered and delinquent populations.

- More than 1.5 million chemical analyses of blood, urine, and hair for 10,000 behavior-disordered persons.
Database Findings

Major biochemical differences between PTC populations and the rest of society.

Several observed chemical imbalances directly impact brain neurotransmitters.
High-Incidence Chemical Imbalances in Behavior Disorders

- Over-Methylation
- Under-Methylation
- Disordered Metal Metabolism
- Pyrrole Disorders
- Toxics
- Essential Fatty Acids
- Glucose Dyscontrol
Frequently Asked Questions

1. How can vitamins, minerals, or amino acids significantly help a violent or autistic child, a depressed adult, or a schizophrenic?

2. Don’t you really need a powerful drug to get the job done?
The Brain = Chemical Factory

- Serotonin, dopamine, and other NT’s are synthesized in the brain.

- The raw materials for NT synthesis are nutrients: vitamins, minerals, and amino acids.

- Nutrient imbalances (genetic or acquired) can result in brain chemistry problems.
Nutrient Imbalances Impact NT’s

- GABA synthesis requires Zn
- Serotonin synthesis requires B-6
- Norepinephrine is Cu++ dependent
- DA, NE, 5-HT levels are impacted by methyl/folate ratio.
Impact of Copper on Dopamine and Norepinephrine Neurotransmitters

Dopamine $\xrightarrow{\text{Dopamine-beta-hydroxylase}}$ Noradrenalin

Dopamine: $\text{CH}_2\text{CH}_2\text{NH}_3$ (O$_2$, vitamin C, Cu$^{2+}$)

Noradrenalin: $\text{HOCH}_2\text{CH}_2\text{NH}_3$
Animal Studies – Impact of Cu Level on Dopamine and Norepinephrine

- Rodents fed Cu-deficient diet reducing blood levels to 25% of normal,
- Brain tissue assayed for dopamine and norepinephrine.

**RESULT:** Norepinephrine/Dopamine Ratio Reduced by a Factor of Four.
Zn Deficiency and Brain Function

- Zn is needed for synthesis of GABA in brain,
- GABA is a “calming” NT that combats overloads of norepinephrine,
- Zn deficiency is associated with irritability, anxiety, and violent behavior.
Cu Overload and Zn Deficiency
A Triple Disaster!

1. Elevated Cu increases norepinephrine levels,
2. Zn-dependent metallothionein proteins unable to eliminate Cu overload,
3. Reduced GABA in brain magnifies symptoms of norepinephrine overload.

Elevated Cu/Zn ratios have been associated with violent behavior, anxiety attacks, autism, post-partum depression, and schizophrenia.
Vitamin B-6 is an Essential Co-Factor in Synthesis of Serotonin

**Indoleamine Pathways**

- Tryptophan
  - tryptophan hydroxylase
- 5-Hydroxytryptophan
  - aromatic-L amino acid decarboxylase
  - pyridoxal phosphate (PyP04) (Vit B6)
- Serotonin
  - (5-Hydroxytryptamine)
- aldehyde dehydrogenase
  - 5-Hydroxyindoleacetic Acid
    - (5-HIAA)

Liver

NADPH

Dihydrobiopterin reductase

NADP
Major Behavior Disorders

- Oppositional Defiant Disorder
- Conduct Disorder
- Episodic Rage Disorder
- Antisocial Personality Disorder
- ADHD
High-Incidence Biochemical Imbalances In Oppositional-Defiant Disorder

1. Undermethylation
2. Elevated blood histamine
3. Elevated blood folate
4. Low homocysteine
5. Low ceruloplasmin
6. Ca, Mg, Zn, B-6 depletion
7. Toxic-Metal Overload
High-Incidence Biochemical Imbalances In Conduct Disorder

- Pyrrole Disorder (55%)
- Over-Methylation (18%)
- Under-Methylation (62%)
- Disordered Metal-Metabolism (90%)
- Toxic Metal Overload (75%)
Episodic Rage Disorder

- Elevated Cu/Zn ratio in blood (90%)
- Pyrrole Disorder (30%)
- Overmethylation (45%)
- Elevated toxic metals (85%)
Antisocial Personality Disorder

- High blood histamine (undermethylation)
- Pyrrole disorder (Zn, B-6 deficiency)
- Elevated toxic metals (Pb, Cd, etc)
- Glucose dyscontrol
- Low serum ceruloplasmin
- Low blood spermine
High Incidence Chemical Imbalances Observed in ADHD

- Elevated Cu (68%)
- Insufficient ceruloplasmin (92%)
- Zinc depletion (96%)
- Methylation disorder (55%)
- Pyrrole Disorder (30%)
- Malabsorption (11%)
Treatment Approach for Disordered Metal-Metabolism

- Supplementation with metals found to be in deficiency (Zn, Mn, etc.)
- Elimination of excess copper & toxic metals
- Aggressive Zn & B-6 therapy for elevated pyrroles
- Metallothionein-Promotion Therapy
- Augmenting nutrients (Vitamins C, E, B-6)
Pyrrole Disorder Symptoms

- Inability to cope with stress
- Episodic rages of long duration
- High Anxiety
- Poor short-term memory
- Sensitivity to bright lights and loud noises
- Abnormal fat distribution
- Academic underachievement
Effective Nutrients for Pyrrole Disorder

- Vitamin B-6
- Pyridoxal-5-Phosphate
- Zinc
- Manganese
- Primrose Oil (Arachidonic Acid)
- Vitamins C, E
Effective Nutrients for Undermethylation

- Methionine
- SAMe
- Calcium
- Magnesium
- B-6
- Serine
- Vitamin D
Effective Nutrients for Overmethylation

- Folic Acid
- Vitamin B-12
- Niacin or Niacinamide
- Vitamin C
- Zinc
- Vitamin B-6
- Manganese
- DMAE
Effective Nutrients for Heavy-Metal Poisoning

- Zinc
- Calcium
- Selenium
- Glutathione
- Manganese
- Vitamins B-6, C, E
- Metallothionein-Promotion
Outcome Study – PTC Protocol for Behavior-Disordered Children & Adults

- 207 behavior-disordered subjects
- Identification of biochemical imbalances
- Individualized nutrient therapy to correct imbalances
- Measurement of frequency of physical assaults and property destruction before & after treatment
Outcome Results - Compliance

- 12% failed to initiate treatment.
- Additional 11% stopped compliance during early treatment.
- The remaining 77% achieved significant compliance throughout the testing period.
### Outcome Results: Compliant Subjects*

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<th>Improved</th>
<th>No Change</th>
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<td>Assaultive</td>
<td>61</td>
<td>35</td>
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<tr>
<td>Destructive</td>
<td>59</td>
<td>39</td>
<td>10</td>
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* 23% of test subjects were non-compliant.
Treatment Outcomes
Compliant Assaultive Subjects

- Symptom-Free: 58%
- Partial Improvement: 33%
- No Change: 8%
- Worse: 1%
Treatment Outcomes
Compliant Destructive Subjects

- Symptom-Free: 53%
- Partial Improvement: 35%
- No Change: 9%
- Worse: 3%
Type A Case History: Brian

- Adopted son of scientist & social worker
- At age 16: violent, destructive, truant, failing academically, defiant with parents
- Dx: Severe Type A metal pattern
- Within 2 months of nutrient therapy, Brian became calm, ceased truancy & became honor student & joined football team.
- Brian enrolled at University of Colorado.
Type B Case History: Mike

- Father was in prison; Mother a recovering alcoholic.
- Mike was age 12: oppositional, defiant, cruel to animals, truant, and assaultive.
- Head of youth gang -- major thefts.
- After 3 months therapy, Mike had become an ideal child and a straight-A student.
- Family moved to Kansas to give Mike a fresh start.
“Type C” Case History: Michelle

- Age 17, with learning disability
- Slender malabsorber
- Impulsivity – Very poor driver
- Lethargy
- Few Friends
- Following 6 months of nutrient therapy, Michelle became more social with grades improving from D- to B+. 
“Type D” Case History: Stanley

- At age 10, Stanley was a poor student with little interest in learning,
- Class clown
- Very drowsy during afternoon classes
- Emotional meltdowns.
- Extreme reaction to sugar.
- After 4 months of hypoglycemia diet and nutrient supplements, Stanley transformed into a good student with improved behavior.
Margaret – Age 13

- In special education – severe LD, speech problems, autism spectrum, many emotional outbursts – IQ measured at 58.
- Severe pyrrole disorder and Cu/Zn imbalance.
- Within 4 months she was mainstreamed into grade 9, became an honor student and succeeded in college.
Danny: Age 8

- Son of prominent scientist (physicist),
- Diagnosed with LD/ADD: Special Ed and Ritalin recommended,
- Disability disappeared within 2 months of nutrient therapy,
- Danny became superior student and entered graduate school at University of Chicago at age 18.
Summary

- Distinctive chemical imbalances are exhibited by most behavior-disordered or ADHD children & adults.
- Most families report major benefits following individualized nutrient therapy.
- Individualized nutrient therapy represents a promising approach for reducing crime & violence.