

Idiopathic Environmental Intolerance (IEI): Toxicogenic and Psychogenic Theories

Herman Staudenmayer, Ph.D.
Multi-Disciplinary Toxicology
Diagnostic, Treatment and Research
Center
Denver, Colorado

IPCS/WHO description of IEI

- An acquired disorder with multiple recurrent symptoms
- Associated with diverse environmental factors tolerated by the majority of people
- Not explained by any known medical, psychiatric or psychological disorder

Bradford Hill's Criteria of Causality Applied to IEI

- Strength
- Consistency
- Specificity
- Temporality
- Biological Gradient

- Plausibility
- Coherence
- Experiment
- Analogy

An Additional Criteria

- **REVERSIBILITY**

1. Strength of Association

- defined in terms of the prevalence of symptoms and disease in the exposed population
- Hausteiner et al. list 252 multiorgan system symptoms of IEI
- no objective signs or laboratory tests

1. Strength of Association

- **TOXICOLOGIC**
- everyone is exposed
- no epidemiological risk factors
- no exclusion criteria
- scientific societies reject it as a diagnosis

- **PSYCHOGENIC**
- functional somatic syndromes
- multiorgan system complaints
- belief and iatrogenic suggestion

2. Consistency

- There are two aspects to replication of findings that apply to IEI:
 - Reliability of symptoms to exposure
 - Independent replication

2. Consistency

- **TOXICOGENIC**

- unsubstantiated methodology
- open provocation challenges illicit reactions
- double-blind, placebo-controlled provocation challenges show unreliability

- **PSYCHOGENIC**

- 1983-2003 studies have over 800 cases
- co-morbid and pre-morbid psychiatric and psychologic disorders

3. Specificity

- The association is limited to people whom have had specific exposures with specific reactions in specific physiological systems
 - In toxicology, the agent determines specificity
 - In IEI, the individual determines specificity

3. Specificity

- **TOXICOGENIC**
- no specific exposures
- no unique physiologic systems
- no specific symptoms
- no objective signs of disease

- **PSYCHOGENIC**
- panic/hyperventilation
- stress physiology
- belief

4. Temporality

- The exposure must precede the effect.
- There are two phases of IEI to which temporality applies:
 - Onset of environmental intolerance
 - Triggered reactions

4. Temporality

- **TOXICOGENIC**
- no specific time course
- precipitating event often by history alone
- *post hoc ergo propter hoc*

- **PSYCHOGENIC**
- genetic predisposition
- childhood trauma
- developmental or personality disorders
- concurrent stressors

5. Biological Gradient

- dose-response
- magnitude of effects correlate with the amount of exposure.

5. Biological Gradient

- **TOXICOGENIC**
- **total body load**
- **no dose-duration-response curve**
- **linearity of effects assumed down to one molecule**

- **TOXICOGENIC**
- **developmental trauma, PTSD, etc.....**
- **lower sensitivity for stress-responses**
- **hyperresponders**

6. Biological Plausibility

- The association must be biologically plausible and consistent with scientific knowledge.

6. Biological Plausibility

- **TOXICOGENIC**
- immune dysregulation
- limbic kindling
- time-dependent sensitization
- RADS, RUDS, IVCD
- neurogenic switching
- toxic encephalopathy

- **PSYCHOGENIC**
- learned sensitivity
- vigilance for exposure
- symptom amplification
- closed belief of attribution

7. Coherence

- The causal interpretation does not conflict with generally known facts of the natural history and biology of the symptoms.

7. Coherence

- **TOXICOGENIC**
- no natural history
- no underlying biology
- IEI mimics the neurobiology of stress and psychiatric disease

- **PSYCHOGENIC**
- neurobiology of stress and emotional trauma
- genetic disposition
- personality traits
- somatization

8. Experimental Intervention

- Some preventive action or intervention prevents the association.

8. Experimental Intervention

- **TOXICOGENIC**
- avoidance of agents
- provocation
neutralization
- sauna depuration
- vitamins-supplements
- “safe house”

- **PSYCHOGENIC**
- medication
- psychotherapy
- psychophysiological
therapy
- behavioral
desensitization

9. Analogy

- There is an analogy to well-characterized disease or disorder.

9. Analogy

- **TOXICOGENIC**
- unlike any known toxic syndrome
- requires a scientific paradigm shift

- **PSYCHOGENIC**
- functional somatic syndromes
- panic disorder

10. Reversibility

- There is improvement in health status with removal from exposure.
- This is not one of the Hill criteria.
- ATSDR* recommended Hill's criteria to infer causation in individual cases of exposure.
- * US Agency for Toxic Substances and Disease Registry

10. Reversibility

- **TOXICOGENIC**
- after initial perceived or actual exposure, there is chronicity.
- treatments offer no cure, only slowing of debilitating effects

- **PSYCHOGENIC**
- beliefs are difficult to restructure
- addressing underlying psychopathology often is effective

Conclusion: Toxicogenic Theory

- Does not meet any of the 10 criteria
 - Hypothesized neurobiological mechanisms are implausible
 - Effects are unreliable
- The research program is degenerative
 - Absence of evidence for postulates
 - Reinterprets evidence supporting Psychogenic theory

Conclusion: Toxicogenic Theory

- A scientific paradigm shift is unwarranted
 - Symptoms are synonymous with disease
 - Attributions are synonymous with cause
 - Methodology is subjective impression and no more

Conclusion: Psychogenic Theory

- Meets all of the 10 criteria
- The research program is progressive
 - Premorbid and comorbid psychopathology is reliable
 - Neurobiological mechanisms of stress-responses and panic explain symptoms
 - Cognitive mechanisms explain triggered reactions

Conclusion: Psychogenic Theory

- IEI is a disorder of belief
- Iatrogenically and socially reinforced
- Somatization
- Motivation: primary and secondary gain
- Treatment is psychological

Medical Cult

- exploitation, personal and financial
- indoctrination
- membership serves psychological defenses, e.g., denial, projection
- preoccupation with rituals obviates insight
- empathic community of believers

Exploitation of the Vulnerable

- indoctrinated to a closed belief
- risk of greater distress and stress-related medical disorders
- chronicity of untreated medical and psychiatric disorders
- social and vocational impairment
- poor quality of life, family alienation
- mortality