Neurodegenerative Diseases Study Guide

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I. Bipolar Disorder

***Abstract*—Disease in which the patient has two diferent mental states: mania and depressive. Patient fluctuates in between the two. Diagnosis is difficult and the cause is not known, but could be related to inherited genetic traits, physiological abnormalities in the brain, chemical imbalance with neurological transmitters abd initiated by environmental stressors.**

***Keywords*—Mania, Depressive**

A. Causes

The direct cause of Bipolar Disorder is unknown, however, it can be related to inherited genetic traits, physiological differences in the brain, chemical imbalance with neurotransmitters and initiated by the environmental stressors.

Genetic causes:

- Familial: Half the people with bipolar disorder have a family member with it
- A person with one parent with it has a 15-25 percent chance of developing it
- A person with a fraternal twin with it has a 25 percent chance of developing, same risks as if both parents have it
- A person with an identical twin with bipolar disorder has eightfold chance

Neurochemcial Causes:

- Dysfunction with neurotransmitters and their respective chemicals
- Norepinephrine
- Serotonin
- May lie dormant and can be activated on its own or triggered by external factors

Environmental Factors:

- Life event extremities
- Altered health habits such as alcohol or drug abuse
- Underdiagnosis in the past could explain the trend of BD at earlier ages
- Substance abuse may not be a cause, but in can worsen the depressive state

***Keywords*—Genetical/Familial, Neurochemical, Environmental**

B. Symptoms

Bipolar disorder is generally characterized by two episodes:

- Manic: Extreme Happiness/Giddiness
  - Hyperactive Mannerisms
- Depressive: Extreme Sadness (Depression)
  - Slower mannerisms

The patient will fluctuate between these two episodes in violent mood swings. They can be in one mood for the whole day than switch to the other one spontaneously. It is dependent on the situation and the individual rather than anything concrete or genetically related. ***Keywords*—Manic, Depressive**

C. Treatments

Treatment options include:

- Medications
  - Mood Stabilizer (Lithium)
  - Antispychotics (Olanzapine)
  - Antidepressants (Fluoxetine)
  - Antidepressant-antipsychotics
  - Anti-anxieties
- Psychotherapy: General term for treating mental health problems by talking with a psychiatrist
- Electroconvulsive Therapy (ECT): Electrical currents passed through the brain to intentially cause a seizure. This wil alter the brain chemistry and thereby help revert certain mental illness symptoms.

***Keywords*—Mood Stabilizers, Antipsychotics, Andtidepressants, Antidepressants-antipsychotics, anti-anxieties, psychotherapy, Electroconvulsive Therapy (ECT)**

D. Special Characteristics

Chracterized by drastic mood swings from periods of extreme highs to extreme lows. This complicates treatment options. The nature of the disease makes diagnosis difficult:

- Similar symptoms to other conditions
- Difficulty with dealing with patients

***Keywords*—Mood Swings**

E. Relation to Other Diseases

- Autism and Asperger
  - Similar symptoms resulting in misdiagnosis
- Depression and Multiple Personality Disorder
  - Symptoms can coincide or be related
- Effect of prescription and non prescription drugs an the brain
  - Can cause or enhance similar symptoms
- Left Neglect
  - Both neurological, but very little similarity

F. Pathology

Has genetic linkage. Regions of interest include mutations on the chromosomes:

- 4p16
- 12q23-q24
- 16p13
- 21q22
- Xq24-q26

Keywords—Chromosomal Mutation

G. Pathophysiology

There is imbalance in neurotransmitters in the brain that lead to mood alterations. Furthermore, the prefrontal cortex (responsible for problem solving and decision making) in adults tends to be smaller and function less.

- Area matures during adolescence, which would explain appearance of disorder around a person's teen years

Keywords—Mood Disorder, prefrontal cortex, neurotransmitters

II. Autism and Asperger's

***Abstract*—Range of neurodevelopmental disorders called Autism Spectrum Disorders (ASD). Asperger's is on the lower end of the spectrum while Autism can range from milder to severe. These diseases can also be characterized under Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS). Autism is characterized by social, behavioral and communicational impairment. Asperger's also implies social and behavioral impairments but communication is fine.**

Keywords—Neurdevelopmental Disorders, Autism Spectrum Disorders (ASD), Prevasive Developmental Disorder Not Otherwise Specified (PDD-NOS), Autism, Asperger's

A. Symptoms and Characterizations

In general, Autism is characterized by social, behavioral and communicational impediments. Asperger's is characterized by social and behavioral impediments but NOT speech impairment.

- Autism: Social, Behavioral, Speech
- Asperger's: Similar to Autism but without communication. Also has Obsessiveness.

Autism Syndrome

1) Communication difficulties
2) Avoid eye contact during conversation
3) Desire to be alone
4) Trouble with feelings
5) Tendency to echo words or phrases
6) Speech delay
7) Witdrawal from socializing

Asperger's Syndrome

1) Impaired nonverbal skills
2) Trouble maintaining relationships
3) May have a lack of empathy
4) May be physically awkward
5) Above average memory
6) Struggle with abstract concepts
7) Intelligence normal to above average
8) Motor skill delays
9) Want to interact with society but doesn't know how

Combined Symptoms

1) Sensory disorders
2) Social impairments
3) Fixated, obsessive interests
4) Repetitive behavior
5) Adherence to routine

1) Co-Ocurring Conditions:

- Anxiety
- Depression
- OCD
- Tourette's
- ADD/ADHD
- Fragile X Syndrome
- Tuberous Sclerosis

2) Diagnosis:

- Start with children
  - Lack of responsiveness
- Questionnaire and screening administered
- Comprehensive evaluation witha multidisplinary team
- Cognitive and language testing

Keywords—Speech impediment: Autism, Obsessiveness no speech impediment: Asperger's

B. Treatment

Autism and Asperger's being psychological disorders, do not really have a direct treatment. Rather, their is therapy to help absolve some of the symptoms, and medication for some of the Co-Occurring Conditions.

- Therapy and behavioral interventions
- Medication for treatment of co-occurring conditions
  - Medicotian for ADD and OCD
- Antipsychotic medication for severe behavior issues
- Preemptive care improves development

Keywords—Therapy, Medication for ADD/OCD, Preemptive care

C. Causes

1) Risk Factors:

- Occurs 5 times more in males
- Genetic predisposition and environmental factors: (TF does this even mean)
- Immune dysfunction and neurological abnormalities
- Genetic and chromosomal conditions
- Child of an older couple == higher risk
- Cause unknown

2) Genetic Theories:

- Immune dysfunction and neurological abnormalities
- X linked, common in males
- Genetical cause more significant in Asperger's than Autism
- Autism may result from a combination of genetics and brain injury

3) Neurological Theories:

- Dysfunction in serotonergic system:
  - Higher levels of serotonin
- Neural Overconnectivity: (TF does this mean)
- Cerebral Overgrowth
- Circuitry abnormalities in cerebellum, hippocampus, and limbic regions
- Loss of Purkinje cells in hippocampus, amygdala, and cerebellum
- Abnormal assembly of dendritic spines
  - Long and thin spines yielding:
- Altered calcium signaling
- Mirror neuron dysfunction
  - Neurons responsible for evolution of language, empothy and conversational skills

4) Immunological Theories:

- Decreased levels of apoptosis
- Metabolic Defects
- Autoimmune diseases
- Viral infections early childhood or prenatal development
- Excessive or improper vaccination OF an immunocompromised child
- Leaky gut
- Gut dysbiosis

5) Prenatal Theories:

- Early birth
- Exposure to pathogens prenatally
- Heavy metal toxicity

Keywords—X linked, Higher levels of serotonin, Limbic system, Mirror neuron

D. Connections to Other Diseases

No connections really to other diseases.

III. Next Disease

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