PEDIATRIC BIPOLAR DISORDER DIAGNOSIS

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INTRODUCTION

○ **Depression** (depressive disorder)
- a condition in which a person may feel sad, angry, or frustrated for long periods of time;
- very treatable (80% show improvements).
- people may become depressed as the result of:
  ○ environmental changes that they have little control over, such as the loss of a loved one or financial problems;
  ○ an imbalance of neurotransmitters.

INTRODUCTION

○ **Bipolar disorder** (manic depression)
- a serious mental illness that is different from the normal ups and downs that everyone goes through;
  ○ during a *manic phase*, the "high" in bipolar disorder, people may experience euphoria, extreme optimism;
  ○ during a *depressed phase*, the "low" in bipolar disorder, people can experience sadness, hopelessness, suicidal thoughts, guilt, anxiety, insomnia, fatigue, irritability.
- untreated, bipolar disorder can result in severe problems, including poor performance in work or school, legal or financial problems, relationship problems, isolation, alcoholism, substance abuse, and even suicide.

INTRODUCTION

○ Nowadays, bipolar disorder is diagnosed by psychiatrists on the basis of symptoms and, when available, family history. On this basis:
- often undiagnosed for years;
- frequently misdiagnosed as unipolar depression or other disorders that have similar characteristics in children, such as delinquency, anxiety disorders, psychosis, ADHD, and learning disorders.

○ However in the past years refinement of neuroimaging techniques, particularly magnetic resonance spectroscopy (MRS) and functional MRI (fMRI), are clarifying the neural substrates of bipolar disorder.

OBJECTIVE

- The objective of this study is use functional magnetic resonance imaging (fMRI) to identify specific neural biomarkers in patients with bipolar disorders.
- The research done by Dr. Mary L. Phillips* to distinguish bipolar disorders on adults patients will be used to distinguish bipolar disorders from unipolar depression and ADHD children.
- For this purposes the brain areas analyzed will be related with the control of emotions.

HYPOTHESIS

- Extrapolating the research performed by Dr. Mary L. Phillips:
  - The neuronal responses in the ventral striatum of bipolar patients, which is associated with the processing of expressions of emotion and reward, should present elevated activity when pictures of faces showing expressions of mild happiness, rather than to faces showing more extreme emotions.
  - The neuronal responses in the dorsal prefrontal cortical area should present reduced activity, as it comprises the regions primarily associated with regulation of emotion. This fact underlie the emotional instability experienced by people with bipolar.

METHODS

- The study employs functional magnetic resonance imaging (fMRI) to compare brain activation patterns in patients diagnosed with bipolar disorder, healthy control and subjects with other disorders.
- The emotion-challenge paradigm will be used studying the neuronal reactions to pictures of people with facial expressions of varying emotions.

METHODS

- Four groups of right-handed unmedicated prepubertal children (mean age 13 years) matched by sex, race, and socioeconomic status will be recruited for studies:
  - 5 with bipolar disorder;
  - 5 with unipolar disorder;
  - 5 with ADHD disorder;
  - 5 healthy control.

METHODS

- Brain activation patterns will be analyzed in 4 sessions of 5 minutes repeating a sequence of pictures.
- The sequences will be:
  - extreme sadness, mild sadness, mild happiness and extreme happiness;
  - extreme happiness, mild happiness, mild sadness and extreme sadness;
  - mild happiness, extreme sadness, extreme happiness and mild sadness.
  - mild sadness, extreme happiness, extreme sadness and mild happiness.

PROBLEM

- Different difficulties may appear when realizing the experiment. Some of them are defined below:
  - collect prepubertal children with the specific disorders;
  - persuade the patients and their family to not medicated them during the experiment.