

The Future of Autism Spectrum Disorders

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Biochemistry 118

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Background

Autism is a **P**ervasive **D**evelopmental **D**isorder that results from damage to the central nervous system.

Characterized by three main behavioral dysfunctions:

- 1) impaired social interactions
- 2) difficulty communicating (verbal and non-verbal)
- 3) repetitive interests.

Background

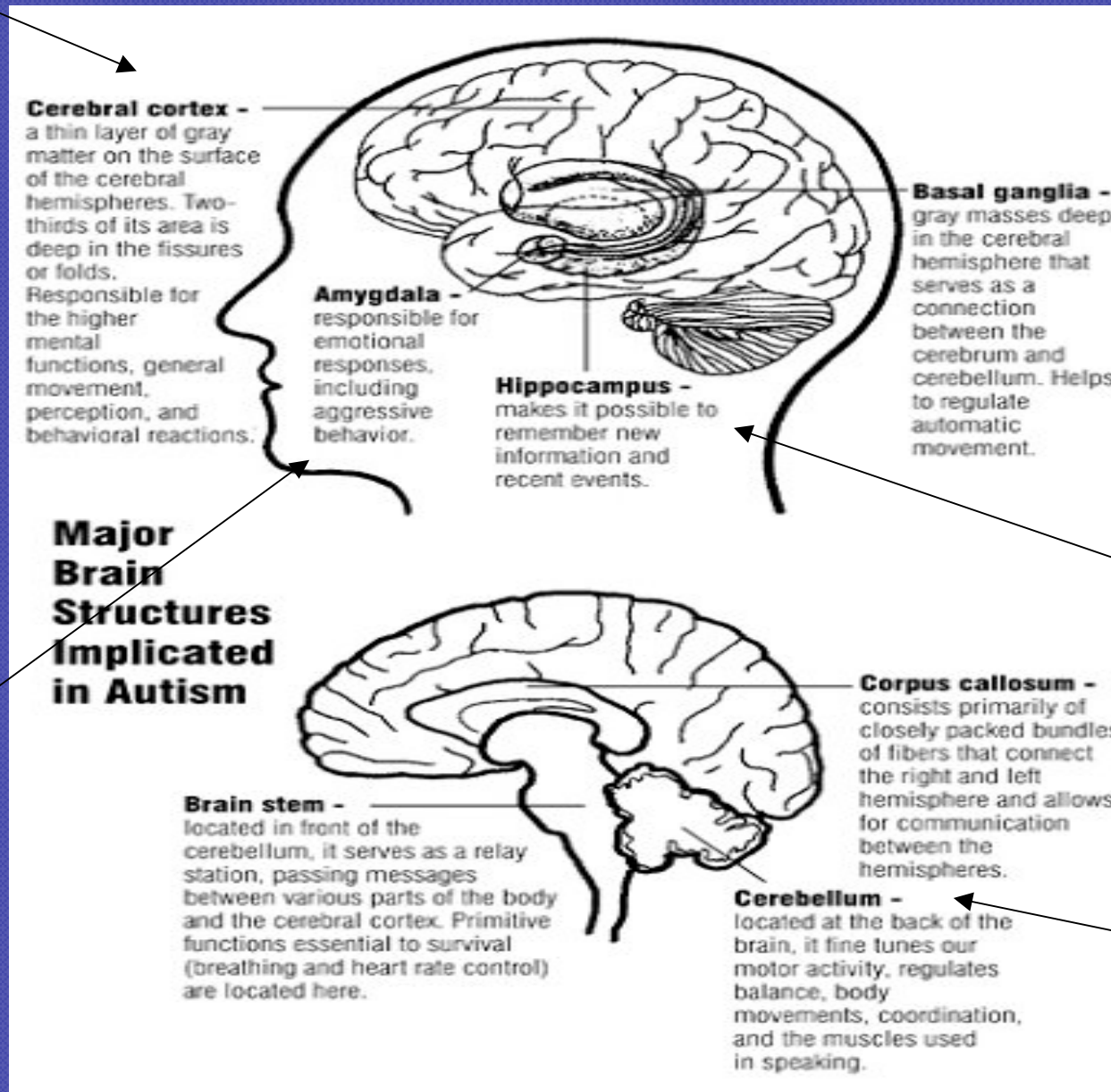
Currently, no biological diagnosis exists

Significant increase in autism genetics research

Sporadic forms of autistic disorder, as well as familial autism, have yet to be identified

Evidence of a genetic and social component to the disorder

Autistic Brain



An Autistic Brain: result or cause of autism?

- Larger frontal lobes due to excess white matter
- Corpus Collosum is undersized
- Amygdala is enlarged
- 10% larger hippocampus. This region is responsible for memory. ASD patients rely on memory to interpret situations
- Cerebellum is larger also due to excess white matter

Too many cables within local areas but not enough linking different regions

Genetic Causes

Caused by disruptions of the NLGN4 gene on chromosome Xp22 thus interrupting essential synaptic function

Maternally inherited duplications of 15q11-q13

Dozens of genes thought to be implicated

Other Possible Causes

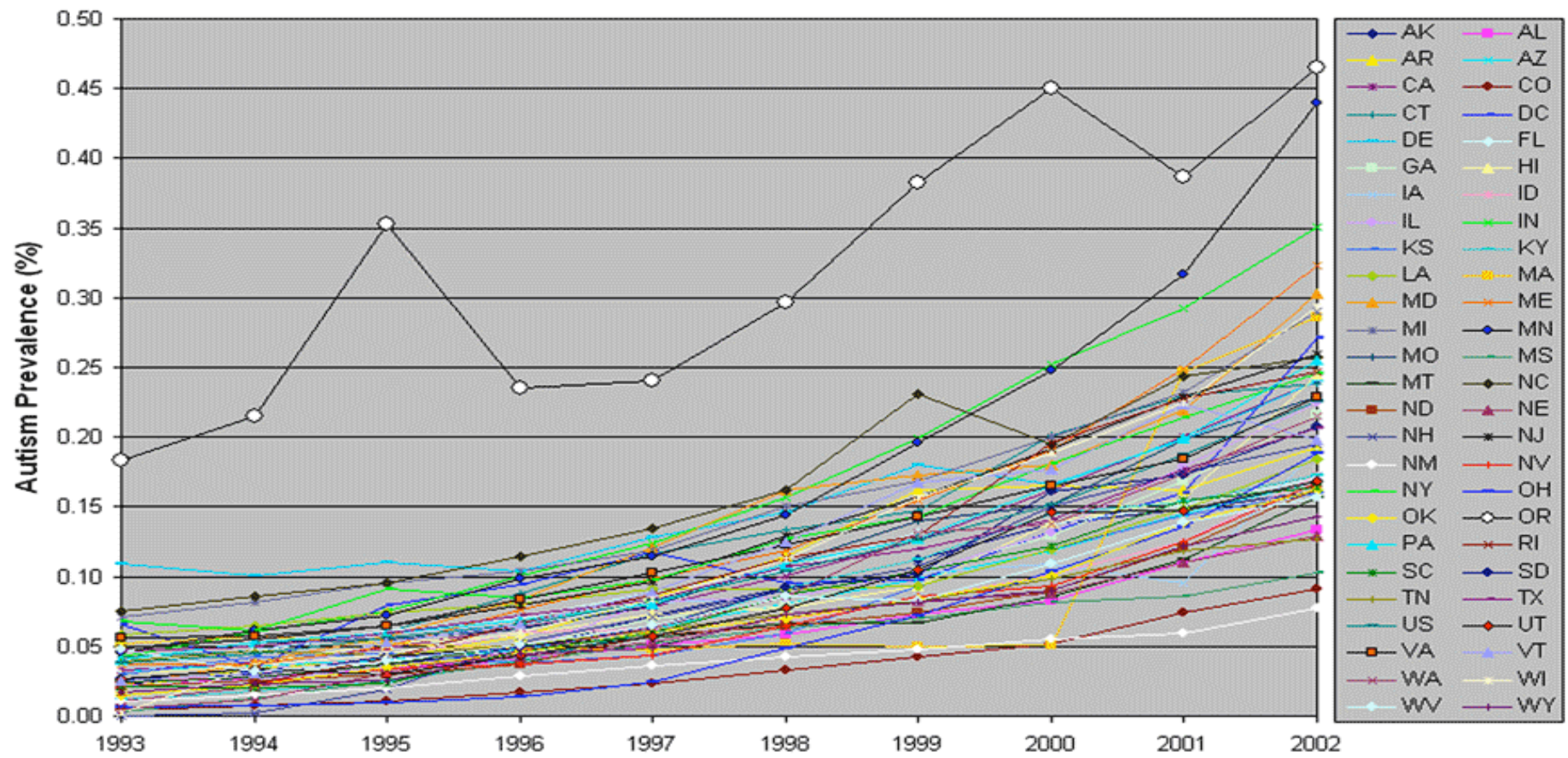
- vaccine reactions
- atypical growth in the placenta
- abnormal tissue in the gut
- inflamed tissue in the brain
- food allergies
- disturbed brain wave synchrony
- Some clinicians are using genetic test results to recommend unconventional nutritional therapies, and others employ drugs to fight viruses and quell inflammation.

Autism in Society

- 1 in 150 children are diagnosed with ASD
- diagnosis can be made as early as 2 years of age
- autistic patients often have a normal life span
- no effective treatment is available, probably because the mechanism of ASD is not understood

Prevalence

Autism Prevalence
by State and Year
[All States]



Medicaid expenditures on children with autism spectrum disorders

- 10 times those of other children
- inpatient psychiatric care
- Further research needed to determine whether hospitalized children could be served less expensive settings

Health care utilization and expenditures

Average health care expenditures increased 20.4% from \$4965 per patient in 2000 to \$5979 per ASD patient in 2004, even after adjustment for inflation.

Health Care Expenditure

- hope in the ability for earlier identification and more proactive treatment of ASDs in the years to come
- ensure that access to care for this vulnerable population is not compromised

Cost Benefit Analysis

Benefit–cost analysis is a method of organizing information in order to help the establishment of priorities when resources are scarce.

Mikesell (1991)

Response to Jacobson and Mulick's Cost-Benefit Analysis

Promotes early intensive behavior intervention (EIBI) only

Based on one un-replicated study whose methodology has been questioned

Argue that schools should bear costs of services

In a given group of children with PDD

- between 20 and 50% will achieve normal functioning
- about 40% will achieve meaningful but moderate gains - about 10% will continue to require intensive special education and adult services

Autism genome project

- Large-scale, collaborative genetics research project started by the National Alliance for Autism Research and the National Institutes of Health
- Searching the human genome of autism-susceptibility genes.
- identify the exact nucleotide variants within genes which give rise to predisposition

Outcome of Project

- therapeutic targets for drug treatments to help improve health and neurodevelopment
- a newborn screening diagnostic that would allow for early intervention

Why I care



Gabriel



Timothy

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