

Diagnostics and Development of Blood Biomarkers for CBS

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02-09-2025

Disclaimer

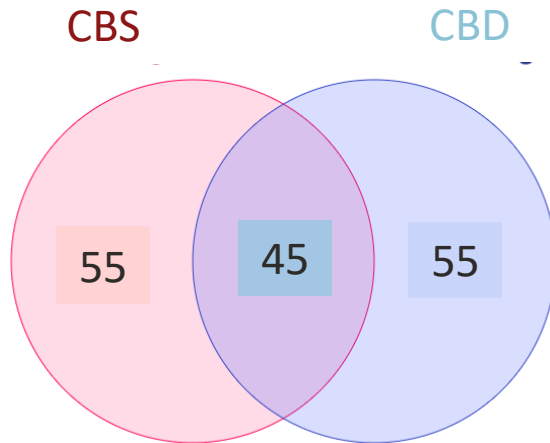
- This is a research seminar, it is not intended for medical or clinical purpose.
- If you have any medical questions or concerns, please contact your doctors.

Outline

- I. CBS vs CBD
- II. Brief introduction about CBS
- III. Current diagnostics of CBS
- IV. A potential blood test for CBS

CBS vs CBD

- Corticobasal Syndrome vs Corticobasal Degeneration
- Clinical diagnosis vs Pathological diagnosis
- Should be the same, but in reality:

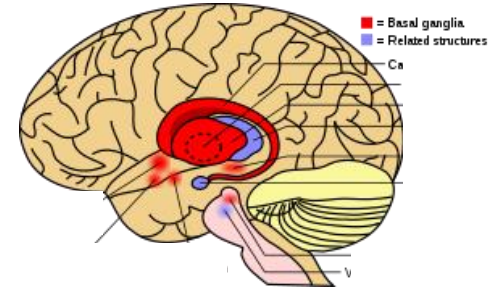


Will use CBS for this talk

A brief history of CBS

- i. in 1967, Rebeiz *et al.* first described three patients
- ii. then largely forgotten
- iii. until 1989, Marsden *et al.* introduced the term ‘corticobasal degeneration’
- iv. in the following years, CBS and CBD have been used interchangeably
- v. in 2002, pathological criteria were established
- vi. in 2013, clinical diagnostic criteria were established.

CBS



1. is a rare neurodegenerative disorder
2. average onset age of symptoms: 61 to 64 years
3. diagnosis is challenging
4. affects everyone differently. Symptoms worsen as the disease develops and affects more of the brain.

Clinical symptoms of CBS varies

Asymmetry

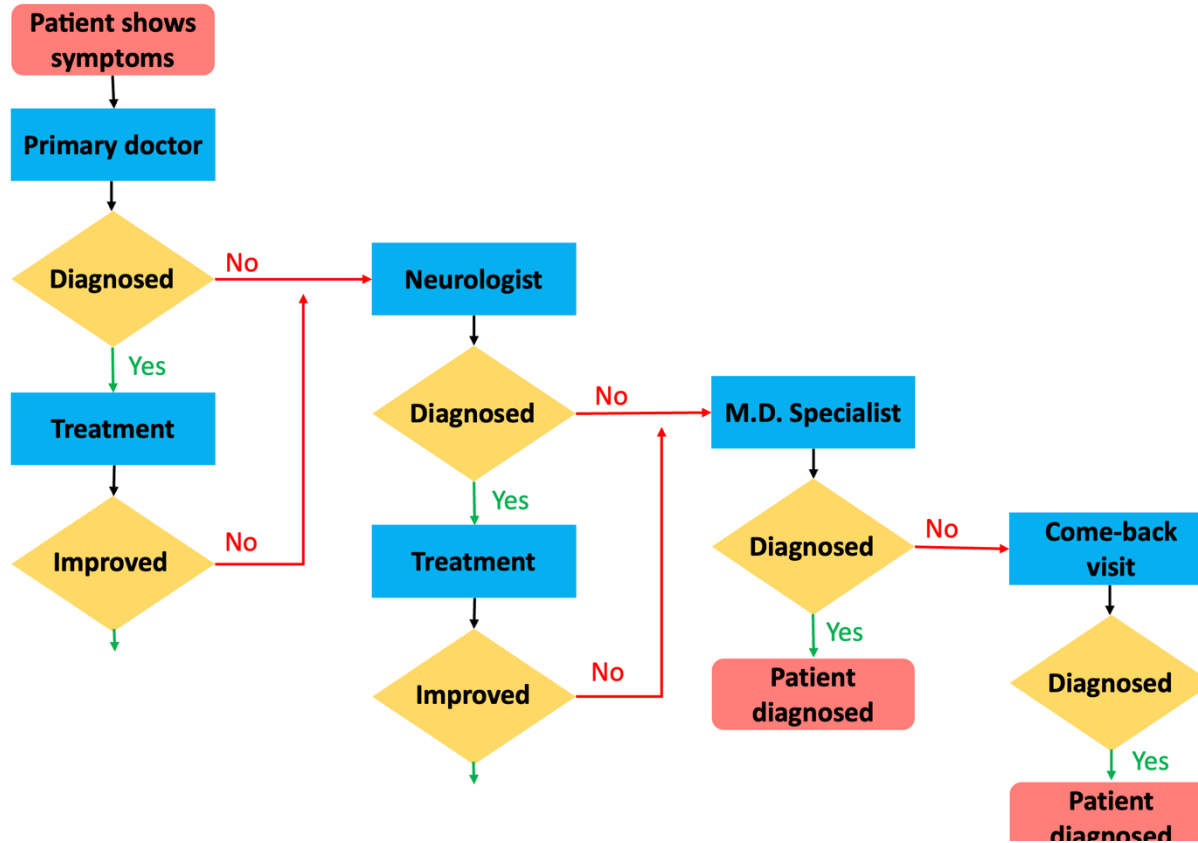
Major symptoms:

1. Limb rigidity
2. Limb difficulty coordinating fine movements (apraxia).
3. Muscle spasms, muscle twitches (myoclonus)
4. Muscle contractions (dystonia).
5. Difficulty controlling one limb (alien limb syndrome)

Minor symptoms:

1. Balance problems and uncoordinated walking gait.
2. Difficulty swallowing.
3. Memory problems.
4. Trouble completing tasks like using utensils or buttoning a shirt.
5. Slowed movements (bradykinesia).
6. Dementia.
7. Slurred or slow speech or difficulty finding the right words (aphasia).
8. Tremors.

The diagnostic procedure for CBS



Dr. Jim Bower, Mayo Clinic
Dr. Montaser Kouhsari, Stanford Hospital

Challenges to diagnose CBS

From patients' perspectives:

- Long procedures: many doctor appointments & visits, travels
- Less motivated: no cure/medicine

From doctors' perspectives:

- For primary doctors & neurologist: lack of knowledge
- For movement disorder experts: challenges to diagnose & the challenge of early-on detection to apply intervention.

The poor diagnostic accuracy for CBS

- A. Only ~20% get diagnosed.
 - a. Estimates indicate that as many as 3,000 Americans may have the condition, but only about 700 have received the correct diagnosis.
- B. Three outcomes:
 - a. Possible CBS: may be symmetric, 1 major + 1 minor symptoms
 - b. Probable CBS: asymmetric, 2 major + 2 minor symptoms
 - c. Definite CBD: autopsy



Our solution :

a blood test for CBS

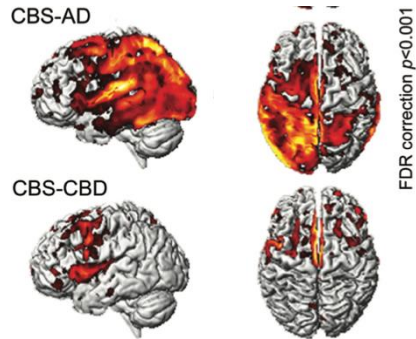
A Blood Test with Biomarkers

- Medical signs stand in contrast to medical symptoms, which are limited to those indications of health or illness perceived by patients.
- Examples: **blood pressure, blood sugar level** are all biomarkers.
- Molecular biomarkers give disease information at the finest level
- Advantages: measurable, accurate, reproducible.

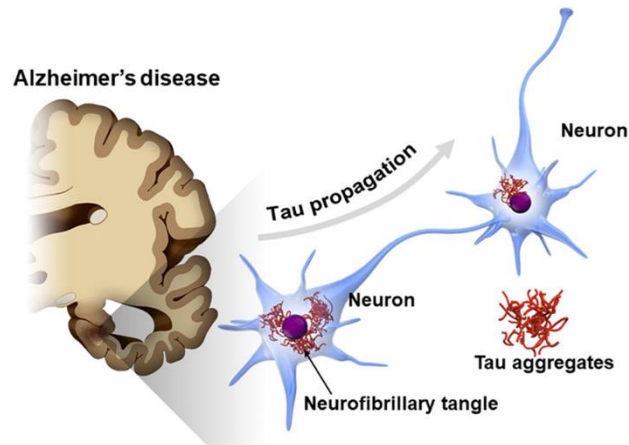
Why do we think it's possible?

Alzheimer's disease: its biomarker story, blood tests on market now!

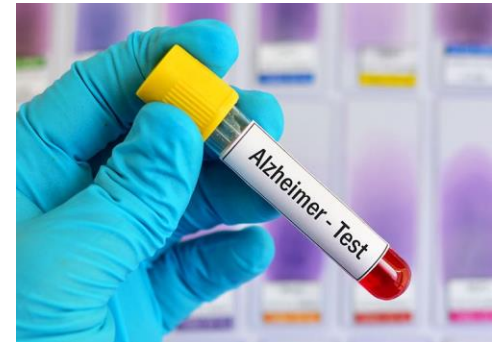
1.



2.



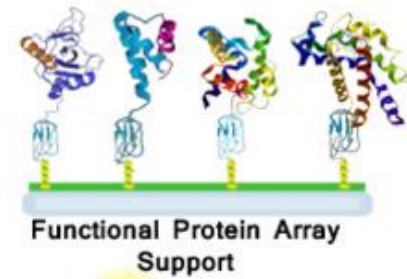
3.



We use cutting edge technologies to searching for CBS biomarkers in the blood



6 Terabases in 2 days
(human genome: 6.72 GB)



>20,000 different protein on 1x3 inch chip
(human proteome: ~20,000)

How a blood test could help CBS diagnostics

From patients' perspectives:

- Long procedures: many doctor appointments & visits, travels
- Less motivated: no cure/treatment



From doctors' perspectives:

- For primary doctors & neurologist: lack of knowledge
- For movement disorder experts: challenges to diagnose & the challenge of early-on detection to apply intervention.



We are recruiting CBS participants
to make it come true!

Dr. Ze Yang

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Consent form to sign

STANFORD UNIVERSITY Research Consent Form

Protocol Director: Joycelyn Jiao

Protocol Title: Development of Plasma Biomarkers in Corticobasal Syndrome

IRB USE ONLY

Approval Date: November 30, 2022

Expiration Date: **(Does Not Expire)**

Are you participating in any other research studies? Yes No

Date: _____

INTRODUCTION TO RESEARCH STUDIES

A research study is designed to answer specific questions, sometimes about a drug's or device's safety and effectiveness. Being in a research study is different from being a patient. When you are a patient, you and your doctor have a great deal of freedom in making decisions about your health care. When you are a research participant, the Protocol Director and the research staff will follow the rules of the research study (protocol) as closely as possible, without compromising your health.

Signing your name means you agree to be in this study and that you will receive a copy of this signed and dated consent form.

Signature of Adult Participant

Date

Print Name of Adult Participant

- **It's a very short lab visit for blood draw (~ 30 mins)**
- **It'd help future patients to be diagnosed, but there is no direct benefits for our participants**

Acknowledgement

Mary Hynes lab

CBS team:

Dr. Poston,

Dr. Jocelyn Jiao,

Marian Shahid,

Kristen Wheeler,

Alena Smith.

Stanford Hospital lab

CurePSP

Brain Support Network - Robin Riddle

Thank you !