
(Neuro)Degenerative diseases

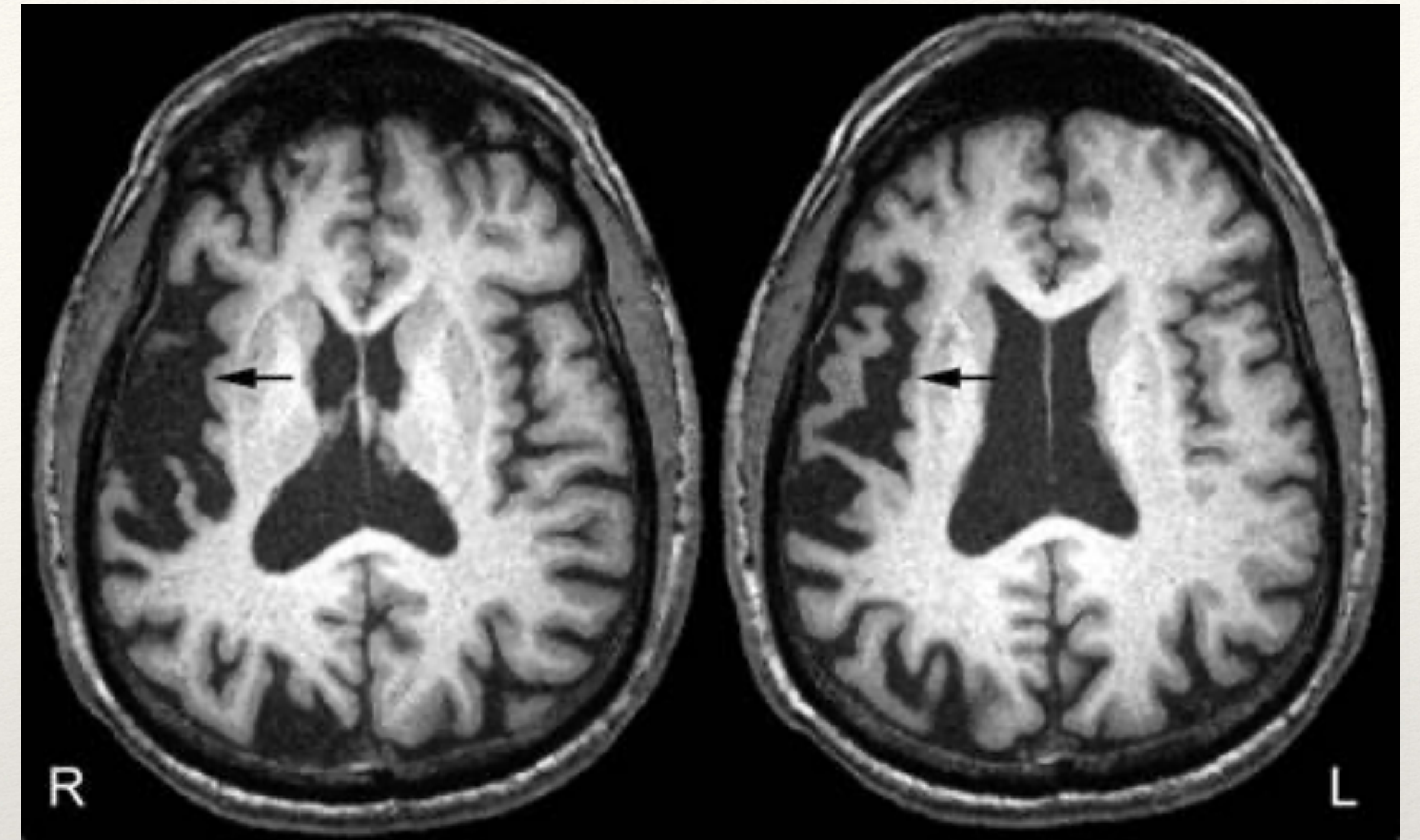
Jim Zhao 202311

Alzheimer's Disease

Amyotrophic Lateral Sclerosis

Huntington's Disease

Parkinson's Disease



Alzheimer's Disease (AD) symptoms

- ❖ Memory 下降
- ❖ Thinking and reasoning 下降
- ❖ Making judgement 下降
- ❖ 晚期: personality changes
- ❖ For some people:
- ❖ Unaffected functions: reading, listening, dancing, singing etc.

AD causes

- ❖ Plaques 斑块
- ❖ Beta-amyloid tangles
- ❖ Tau protein — neurofibrillary tangles

AD treatments

- ❖ FDA: aducanumab 阿杜卡双单抗
- ❖ Cholinesterase inhibitors 胆碱酯酶抑制剂 e.g. galantamine, donepezil, revastigmine, Memantine

Amyotrophic Lateral Sclerosis (ALS) symptoms

- ❖ 从四肢开始，到其他部位——无法咀嚼，吞咽，言语，呼吸

ALS causes

- ❖ Motor neurone gradually deteriorate — muscles cannot function

ALS treatments

- ❖ Riluzole 利鲁唑
- ❖ Edaravone 依达拉奉

Huntington's disease (HD) symptoms

- ❖ 舞蹈样症状——四肢，面部，躯干突然快速抽动（成年）
- ❖ 认知障碍，精神障碍（未成年）

HD causes

- ❖ Huntington (HTT)变异 —— protein accumulate —— basal ganglia dysfunction —— 无法修饰皮层指令 —— 皮层神经元死亡 —— 认知下降，行动能力下降

HD treatments

- ❖ 暂无药物延缓进展
- ❖ 对症治疗：GABA下降，ACh下降，多巴胺（DA）上升
- ❖ So, 用对抗DA能药物：DA受体抑制剂
- ❖ Physostigmine 毒扁豆碱 —— 抑制cholinesterase —— 抑制ACh降解 —— ACh increases

Parkinson's Disease (PD) symptoms

- ❖ 静止型震颤 static tremor
- ❖ 肌肉强直 muscle rigidity
- ❖ 运动迟缓
- ❖ 平衡障碍
- ❖ 认知功能障碍
- ❖ 失眠，抑郁，嗅觉问题

PD causes

- ❖ Genetics 10%
- ❖ Environment / age factors —— 长期接触杀虫剂，除草剂等化学物品
- ❖ Dopaminergic neurones in substantial nigra decrease to 80%
- ❖ Lewy bodies

PD treatments

- ❖ L-Dopa, which can go through blood-brain-barrier
- ❖ DBS—— deep brain stimulation