

Drugs used for treatment of Alzheimer disease

Pathology: \downarrow Ach \rightarrow \downarrow memory

Pharmacologic strategy: \uparrow Ach

Acetylcholine esterase inhibitors:

Donepezil and Galantamine

- Mechanism: inhibit metabolism of acetylcholine by inhibiting AChE
- These agents provide *modest reduction in the rate of loss of cognitive functioning by about 6 months*,
- Side effects: (\uparrow cholinergic activity)
Diarrhea, salivation, lacrimation, muscle cramps, etc

NMDA receptor antagonists

Memantine

- One of the hypotheses of the etiology of Alzheimer disease is that the persistent excitation of the NMDA receptors by glutamate leads to neuronal damage
- Mechanism: NMDA receptor antagonism \rightarrow \downarrow **neural excitation by glutamate** \rightarrow improvement of Alzheimer patients
- Use: treatment of moderate to severe Alzheimer disease.
- Side effects: CNS effects; confusion, restlessness, etc.

Drugs used in treatment of bipolar disorder:

*Remember: patients with bipolar depression *should not* take antidepressants (like fluoxetine), but if we needed to give antidepressants we use **paroxetine**

Lithium

- A *mood stabilizer* (works for both depressive and manic attacks)
- Mechanism: ***inhibits second messenger signal transduction, which may interfere with serotonin*** metabolism. it also affects gene expression and neuronal membrane stabilization (the mechanism of action is not completely understood)
- Side effects: Neurological, GI, enlarged **thyroid**, rash, weight gain, **kidney** dysfunction, cardiovascular side effects.
- Serum levels of lithium must be monitored closely due to *narrow therapeutic window* of the drug and thus, an increased risk for lithium intoxication.
- Patients on lithium should stabilize their sodium intake (Na^+ and lithium compete for reabsorption)

Valproic acid

- An antiepileptic
- Mechanism: $\uparrow \text{GABA}$, *also has effects on sodium and calcium entrance* leading to hyperpolarization of the neuron.
- Use: tonic clonic seizures (may accompany manic attacks). and treatment of **mania**
 - If the patient doesn't have depressive attacks but only mania, *don't give lithium*
- Side effects: **Metabolic liver changes**, GI upset, sedation, alopecia (hair loss)
 - If the patient can't tolerate the sedation (elderly), switch to lamotrigine or carbamazepine.

Lamotrigine

- *No sedation* (alternative of Valproic acid)
- **Stevens-Johnson syndrome**

Antipsychotics

- Typical: unfavorable; used to control acute manic attacks
 - Atypical: if mania was accompanied with psychosis
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CNS Stimulants

Methylphenidate: used for ADHD

Smoking cessation therapy:

Bupropion; antidepressant, not used really

Varenicline: partial agonist of nicotine receptor → mild withdrawal signs

و الحمد لله الذي بنعمته تتم الصالحات

شكر خاص لليلي مُحمَّدِين و سسارة زيادة اللتين كتبتا الشيت ولولا ذلك لما أمكن كتابة هذا الملخص

