

Serotonin syndrome morphing into acute dystonia due to polypharmacy

A deep dive into the world of pharmacokinetics and pharmacodynamics

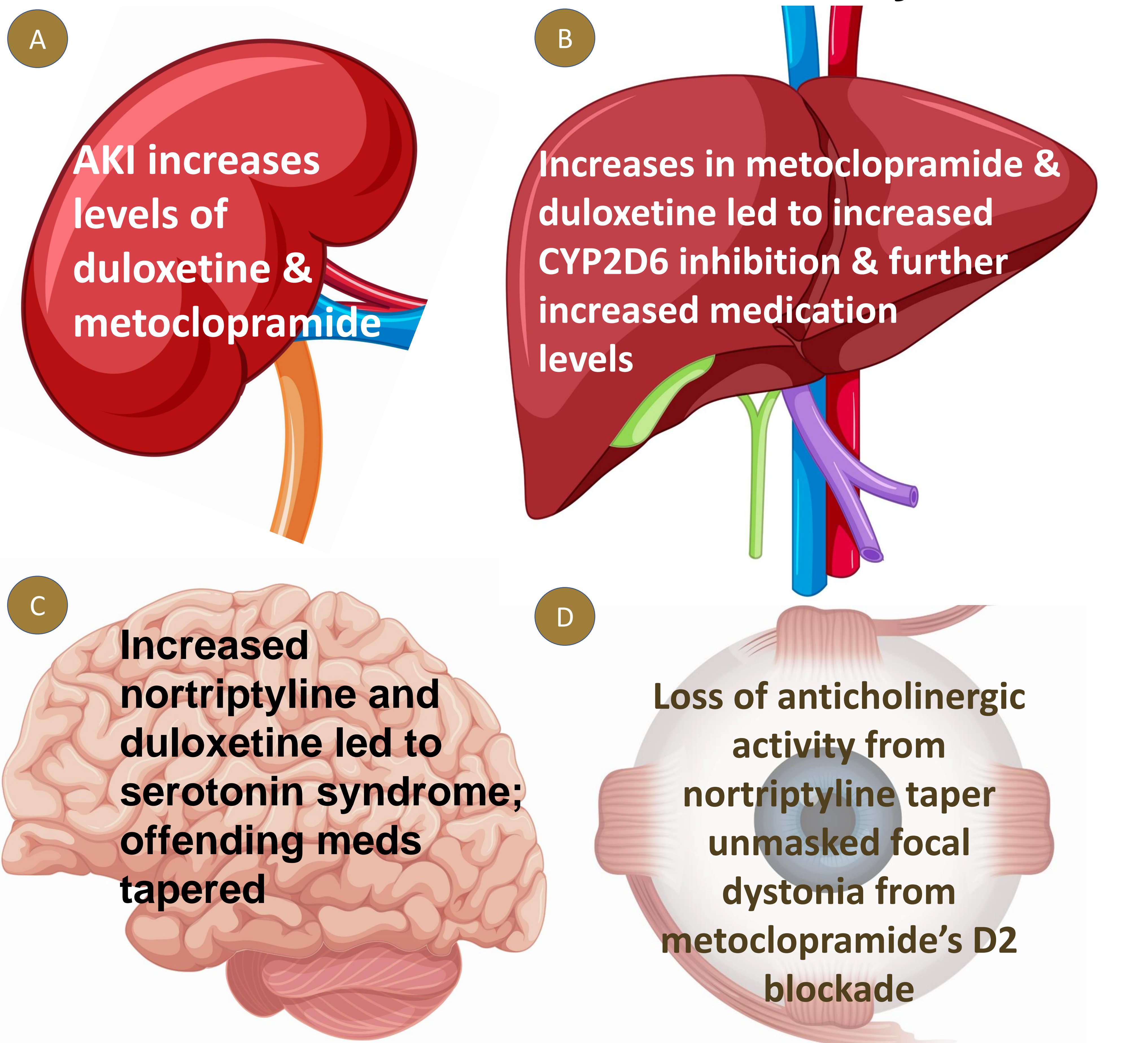
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Case

Ms. M is a 42-year-old female with complex past medical history including asthma (on home oxygen), T2DM, OSA on CPAP, HTN, HLD, CKD (baseline Cr 1.6) and MDD. Home medications included **nortriptyline** 150 mg, **duloxetine** 60 mg BID and **metoclopramide** 10 mg q4 PRN

Day 1	Presents after a fall with an AKI from nausea + vomiting	Home meds continued; Metoclopramide converted to IV and scheduled
Day 5	Clonus, chills, diarrhea, akathisia, hallucinations and tremulousness; diagnosed with serotonin syndrome	Duloxetine and nortriptyline tapered.
Day 6	Clonus resolved; patient with periods of sustained upward gaze and muffled speech; diagnosed with oculogyric crisis	IM benztropine provided rapid relief

Pharmacokinetics & Pharmacodynamics



	Metoclopramide	Nortriptyline	Duloxetine
Kinetics	Metabolized by 2D6 and 3A4; Significant impairment in clearance in renal impairment. ~80% bioavailable ¹	Metabolized by 2D6; no significant renal metabolism ⁴ ⁹	Hepatically metabolized by 2D6>1A2. Possible reduction in clearance in renal impairment. ³ ¹²
Dynamics	D2 receptor antagonist; 5HT3 antagonist ⁵ ¹¹	Inhibits reuptake of serotonin and nor-epi; strongly anticholinergic ⁷ ¹⁰	Inhibits reuptake of serotonin and nor-epi

Clinical Pearls

Patients may present to the hospital on **complex medication regimens** with unknown home adherence; medication combinations are rarely tested in clinical trials² ⁶ ⁸.

Giving home medications as prescribed can eliminate potential **protective noncompliance** in polypharmacy² ⁶ ⁸

Changing medications to scheduled vs PRN and PO vs IV can **increase likelihood of adverse effects**

Both addition **and** removal of a medication can precipitate adverse effects

Potential medication interactions **increase exponentially** with number of medications

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