

A fatal case of serotonin syndrome after combined moclobemide- citalopram intoxication

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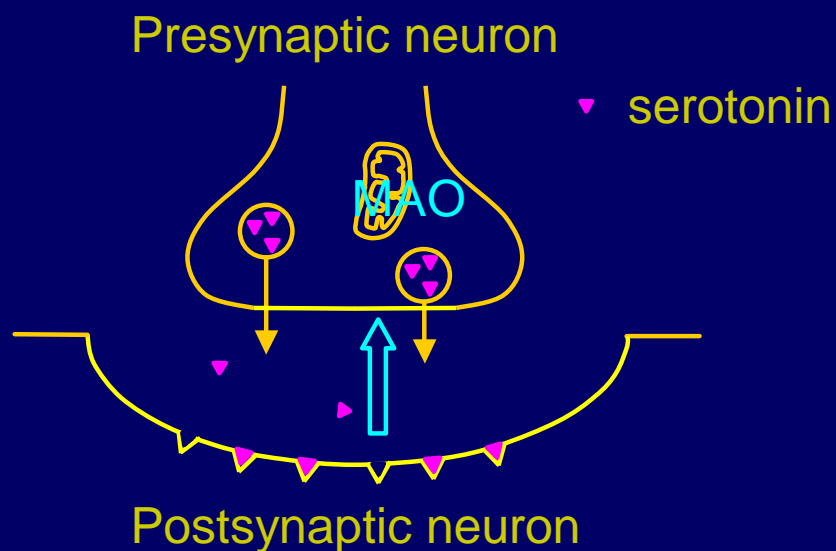
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1. Introduction:

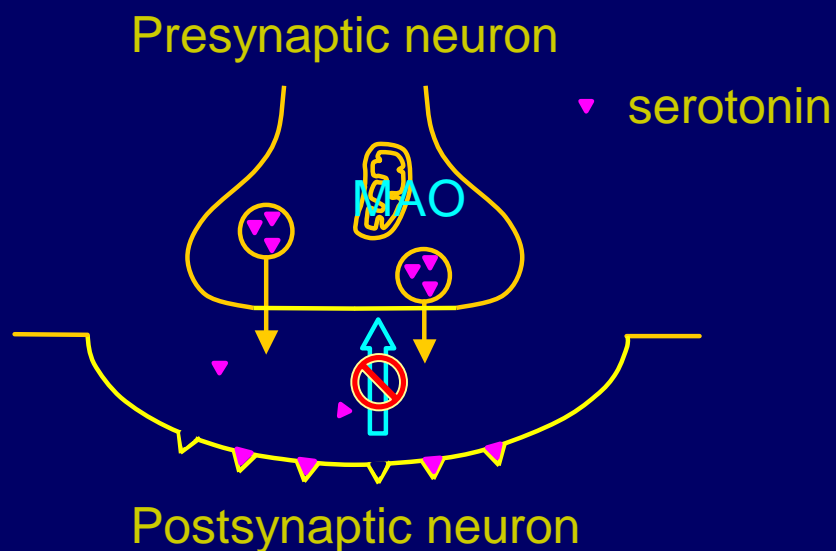
- ✍ new generation of antidepressive drugs
- ✍ as effective, less cardiotoxic as TCAs
 - ✍ Selective Serotonin Reuptake Inhibitors (SSRI)
e.g. citalopram
 - ✍ selective and reversible Monoamine Oxidase Inhibitors Type A (MAO-A)
e.g. moclobemide

✍ co-ingestion ✍ “serotonin syndrome”



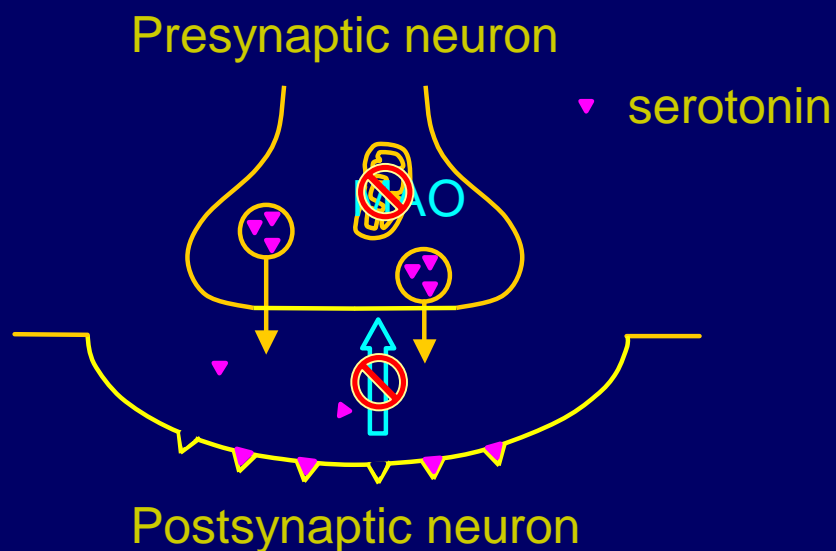
✍ symptoms: hyperthermia, tachycardia, convulsions, cardiac arrest, ...

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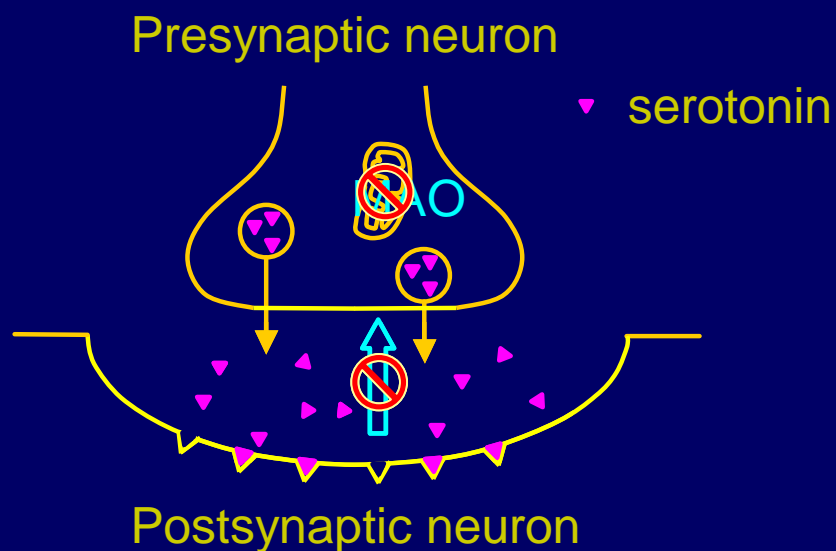
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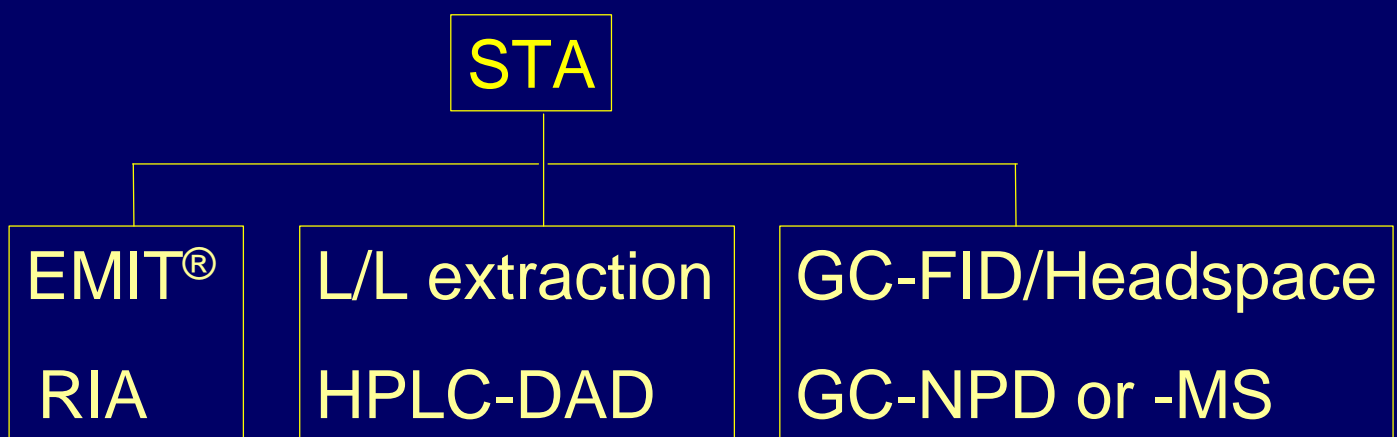


✍ symptoms: hyperthermia, tachycardia,
convulsions, cardiac arrest, ...

2. Case history:

- ✍ male, 41 years, suicidal history
- ✍ empty containers of medication
 - ✍ Noctamid[®] (2 mg lorazepam)
 - ✍ Aurorix[®] (150 mg moclobemide)
 - ✍ Cipramil[®] (20 mg citalopram)
- ✍ bottle of whisky, farewell letters
- ✍ police investigation ✍ external examination ✍ systematic toxicological analysis (blood and urine)

3. Systematic Toxicological Analysis:



Results: cotinine, caffeine, lormetazepam, ethanol, and identification of citalopram and moclobemide

4. Analytical problems:

✍ Internal standard?

✍ **Dual internal standardisation**

✍ Alkaline liquid/liquid extraction: low recovery (< 50%)

✍ **Automated solid-phase extraction**

✍ recovery: 80.4 - 101.4%

✍ reproducibility: CV% < 6%

✍ Chromatographic analysis: poor resolution of parent compounds from metabolites

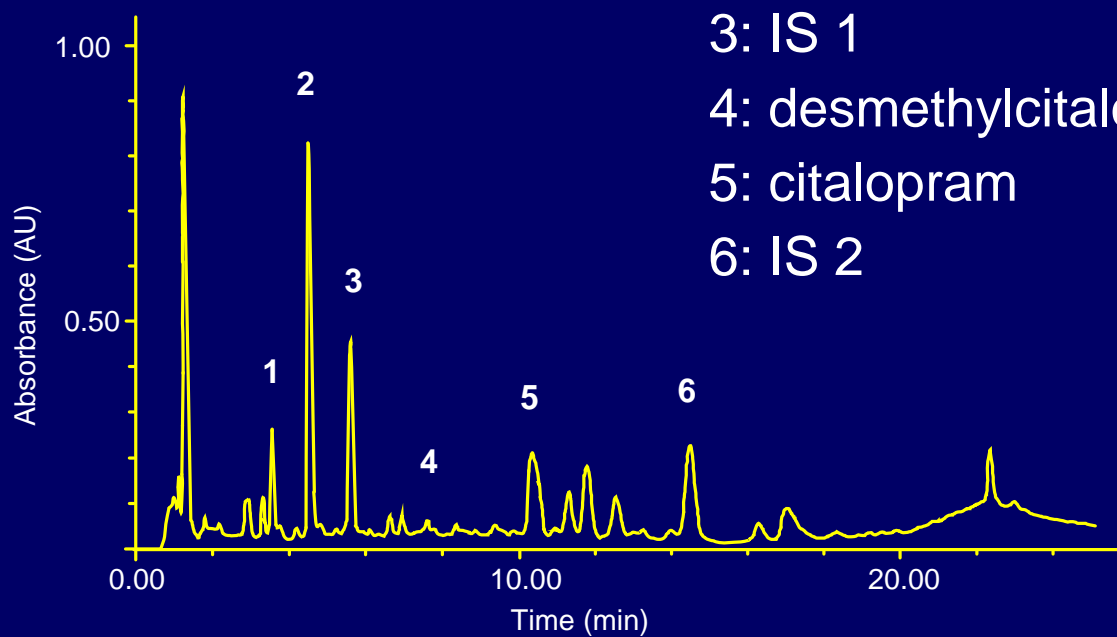
✍ **optimized HPLC-DAD system:**

- Kromasil 100 C18 column
- optimized gradient conditions
- optimal wavelength (= 237 nm)

✍ baseline separation

✍ LOD = 15ng, LOQ = 50 ng

5. Results:



- 1: 3-keto-moclobemide
- 2: moclobemide
- 3: IS 1
- 4: desmethylcitalopram
- 5: citalopram
- 6: IS 2

Analyzed compounds	Blood (?g/mL)	Urine (?g/mL)
Moclobemide N-oxide	-	424
3-Keto-moclobemide	2.26	49.7
Moclobemide	5.62	204
	Ther.: 0.4 – 3.0	
Desmethylcitalopram	0.42	1.22
Citalopram	4.47	19.7
	Ther.: 0.03 – 0.20	
Ethanol (* g/L)	0.23*	0.67*
Caffeine	-	1.20
Cotinine	0.63	5.08
Lormetazepam	-	1.65

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6. Conclusion :

- ✍ cause of death: combined toxicity of moclobemide and citalopram
 - ✍ “serotonin syndrome”
- ✍ chronic (ab)user of these antidepressants
- ✍ probable manner: suicide?