

EMC 370

Medical Emergencies

Overdoses Continued, ASA,...

Lecture 13

Cline p. 549

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Outcomes

At this lecture's completion, the learner will be able to:

- Integrate pathophysiological principles with clinical presentations of Salicylate OD, and of other toxic causes of seizures
- Discuss the Treatment of Salicylate OD and of toxic seizures - in general

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Outcomes (cont.)

- Discuss the toxicity and treatment - in general of ODs other than ASA such as:
 - INH
 - Cardiac Medications
 - Hypoglycemic agents
 - Bupropion (C 524)
 - SSRIs (C 524)
 - MAOIs (C 527)
 - Antipsychotics (C 532)

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ASA OD - Management

- Initial approach: same as for other poisonings
- Patient recognized as ALS, as potentially unstable, and not mistaken for stable
 - C A B C D E / C O M E B I G

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Salicylate Lethality

- Lethal dose :
 - 150 - 300 mg/kg
- Present in many OTCs
 - Pepto Bismol (9 mg/cc) [LD: 16cc/kg]
 - Oil of wintergreen (1400 mg/cc) [LD: 0.1cc/kg]

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Salicylate Pathophysiology

Pathophysiology

- stimulation of medulla → ↑ RR
- ↑ heat production
- ↑ metabolic acidosis
- ↑ glucose metabolism
 - (↑, ↓, or nl. serum / low brain glucose levels)

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Salicylate OD

Clinical Features

- Symptoms:
 - N, V; dizziness “flu - like symptoms”
 - tinnitus
 - dyspnea
 - “not acting right”
- Signs
 - diaphoresis
 - ↑ T⁰
 - ↑ RR (Kussmaul)
 - late: CNS: coma, seizures

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Salicylate OD Complications

- Heart
 - pulmonary edema
 - arrhythmias
- Brain
 - psychosis
 - delirium
 - seizures
 - coma
- Hypoglycemia

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Salicylate OD - Treatment

- ABCs / COMEBIG
- E : charcoal 1 gram / kg
consider WBI for ECASA
- treat shock - correct hypovolemia with NS
1000mL/hr
- treat **hypoglycemia** - D₅₀ IV
- treat acidosis - consider bicarb, 1-2 mEq/kg IV

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Drugs, Toxins and Status Epilepticus

- Account for large percentage of cases of status epilepticus
- Thus poisoning must be considered in any seizure patient with :
 - no history of prior seizure disorder
 - drug- induced status epilepticus may require specific antidotal therapy to terminate seizures
 - as is the case of status epilepticus due to isoniazid

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Isoniazid

- Certain Populations
 - New York City
 - Plains Indian reservations
 - Hmong immigrants
- Incidence
 - a dramatic increase in the number of isoniazid-induced seizures in New York City
 - often refractory to standard management strategies

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Isoniazid Toxicity

Mechanism of toxicity of Isoniazid (and Gyromitra mushrooms)

- Interferes with synthesis of inhibitory neurotransmitter
 - (Gamma)-aminobutyric acid (GABA)
- Benzodiazepines specifically enhance inhibitory effects of GABA, and
- benzodiazepines require the presence of GABA to be effective
- So, no GABA = no benzo efficacy

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Isoniazid Antidote

Antidote Mechanism

- IV administration of high-dose pyridoxine (vit. B₆)
 - reverses the pharmacologic effects induced by isoniazid and
 - terminates the seizure.
- In areas of high prevalence of isoniazid OD
 - consider routine adm of B₆ to all patients with :
 - seizures refractory to conventional doses of intravenous benzodiazepines
 - because of safety of 5 g (5000mg) of IV pyridoxine (70 mg/kg in children)

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Toxic Seizures, General Treatment, cont

Toxic seizures are often transient

- in which case no specific treatment is required.
- when treatment is required:
 - benzodiazepines usually effective
 - diazepam or lorazepam

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General Treatment for Toxic Seizures - Summary

If benzodiazepines fail:

- *Barbiturates* (e.G., Phenobarbital) almost always suffice
 - But not available in the prehospital
- *Phenytoin* probably has no role in toxin-induced seizures
 - harmful in tricyclic poisoning
 - also has no role and is harmful in theophylline overdoses
- *NaHCO₃* may have a role in acidosis-related seizures
- and consider simple, safe, cheap alternatives : B₆ + Mg⁺⁺
- finally consider : *RSI*

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Other OD Drugs

Bupropion (C 524)

SSRIs (C 524)

MAOI (C 527)

Antipsychotics (C 532)

Cardiac Meds

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Bupropion

Bupropion (Wellbutrin) (Zyban) *red book : 524*

- Monocyclic antidepressant
- Sustained-release (SR) preparation, (Zyban®)
 - is used as an aid in smoking cessation
- Wellbutrin®, same drug - is not sustained release
 - is used as an antidepressant
 - very narrow therapeutic window
 - toxicity at as little as 50 mg above therapeutic dose

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Bupropion OD

Bupropion OD

- Symptoms
 - N, V, HA, tremor, ALOC
- Signs
 - ↑ T⁰
 - ↑ BP
 - ALOC / agitation / psychosis
 - Seizures

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Bupropion OD Treatment

Bupropion OD treatment

- ABC / COMEBIG
- Elimination
 - Charcoal 1 gram / kg PO or NG
- Definitive treatment
 - treatment of \uparrow BP : usually NOT necessary
 - treat \uparrow T⁰ : cooling
 - treat agitation : benzo.s
 - treat seizures : benzo.s

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Other OD Drugs: SSRIs

SSRIs (Prozac, Zoloft, Paxil, Luvox, Celexa)

C 526

Selective serotonin reuptake inhibitors used for:

- Possible serotonin deficiency syndromes :
 - depression
 - OCD
 - panic
 - bulimia
- Migraine
- Very high therapeutic index, i.e., extremely safe

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SSRIs

SSRI OD

- Symptoms
 - HA, N,V, tremor, sedation
 - Parkinsonian; akathisia (restlessness)
- Signs
 - dry mouth
 - diaphoresis

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Serotonin Syndrome

SSRI OD

Most serious sx./signs: *serotonin syndrome*

- ANS (“hot, stiff, + mad”)
 - \uparrow T⁰
 - \uparrow HR , \uparrow RR , \uparrow BP, \uparrow pupils
- Neuromuscular
 - \uparrow DTRs, rigidity
 - Trismus (lockjaw)
- ALOC
 - Agitation
 - Hallucinations
 - Seizures

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SSRI OD Treatment

Serotonin Syndrome and SSRI OD treatment

- ABC / COMEBIG
- Elimination
 - Charcoal 1 gram/ kg PO or NG
- Definitive treatment
 - treatment of \uparrow BP : usually NOT necessary
 - treat \uparrow T⁰ : cooling
 - treat agitation : benzo.s
 - treat seizures : benzo.s

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MAOI Toxicity

MAOI

C 527

Monoamine oxidase inhibitors

- older antidepressant
 - rarely used now
 - except : ? St John’s wort
- very narrow therapeutic index, i.e., not safe
 - potentially fatal food interaction

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MAOI Food or Drug Interaction

Generation of excess NE:

- By tyramine foods
 - Sauerkraut
 - Aged or pickled fish or meat
 - Aged cheese
 - Chianti / red wines
 - Yeast extract
- By ↑NE drugs (see p. 529)
 - BT
 - Dopamine
 - Meperidine
 - Phenothiazines
 - Fentanyl
 - Beta blockers

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MAOI - OD Tx.

Whether the excess NE tyramine foods, ↑NE drugs, or an overdose:

- ABC / COMEBIG
- Elimination
 - Charcoal 1 gram/kg PO or NG
- Definitive treatment
 - treatment of ↑BP : **NTG**
phenolamine
NOT beta blockers
 - treat ↑T⁰ : cooling
 - treat arrhythmias : usual ACLS (**NOT** bretylium)
 - treat seizures : benzo.s

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Other OD Drugs

Antipsychotics

C p.532

- OD complications:
 - ALOC
 - Parkinsonian
 - ↓BP
 - Seizures
 - Arrhythmias
 - TdP
- Tx.
 - TCA - like
 - Diphenhydramine 25mg IV

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OD Drugs and Antidotes

Cardiac Meds

C 559; T chap. 168-71

<u>Drug</u>	<u>Antidote</u>
• Dig.	- Mg ⁺⁺
• Clonidine	- naloxone
• β blockers	- glucagon 50 mic/kg ≈ 5 mg IV
• Ca ⁺⁺ blockers	- Ca ⁺⁺ glucagon

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Hypoglycemic agents

- Oral agents
 - Peak(usually) at 3-4 hrs.
 - Duration: 6-60 hrs.
- Causes of OD
 - Change in medication
 - Suicide
 - Homicide
 - Child abuse
 - Elderly or disoriented

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Danger of Oral Hypoglycemic Agents

- Signs and Symptoms
 - Headache, confusion, seizures
 - May have focal (stroke-like) signs
 - Adrenergic: diaphoresis, tachycardia,...
 - Hypothermia
- Plan
 - Even if patient dramatically improves
 - with D50W
 - **ALL** oral ODs should be *transferred + admitted*

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Summary

We have discussed:

- Pathophysiological principles and clinical presentations of Salicylate OD , and of several other toxic causes of seizures
- Treatment of Salicylate OD and of toxic seizures and other complications in:
 - INH
 - Cardiac Medications
 - Hypoglycemic agents
 - Psychiatric medications
- Antidotes for various medication overdoses

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