CLINICAL GUIDELINE

Serotonin Toxicity Recognition and Treatment

A guideline is intended to assist healthcare professionals in the choice of disease-specific treatments.

Clinical judgement should be exercised on the applicability of any guideline, influenced by individual patient characteristics. Clinicians should be mindful of the potential for harmful polypharmacy and increased susceptibility to adverse drug reactions in patients with multiple morbidities or frailty.

If, after discussion with the patient or carer, there are good reasons for not following a guideline, it is good practice to record these and communicate them to others involved in the care of the patient.

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Approval Group:	Glasgow Emergency Medicine Clinical Governance Group.

Important Note:

The Intranet version of this document is the only version that is maintained.
Any printed copies should therefore be viewed as 'Uncontrolled' and as such, may not necessarily contain the latest updates and amendments.

Serotonin Toxicity, Recognition and Treatment

Problem

Multitude of "Novel Psychoactive Substances" (NPS)

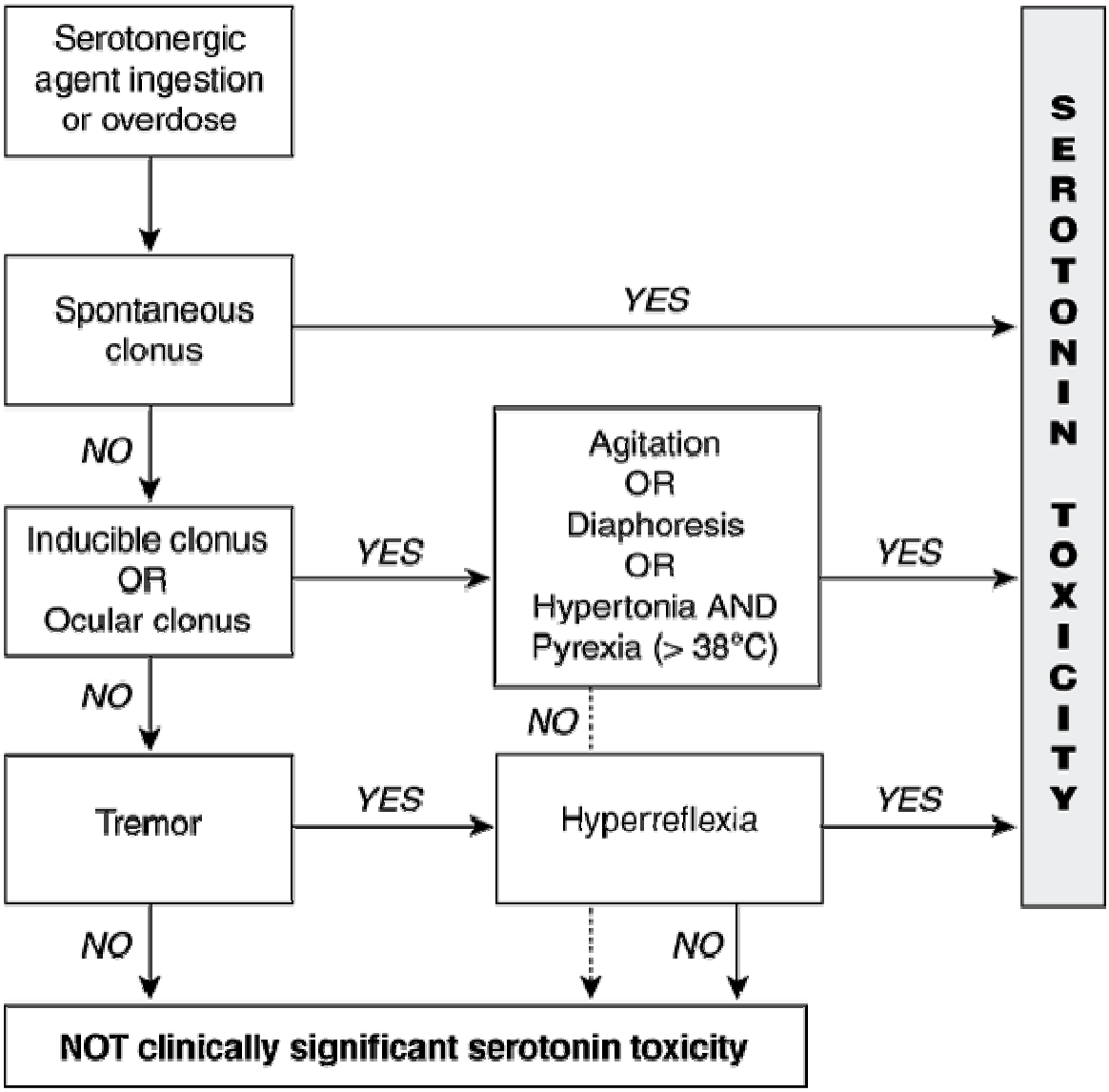
Multiple agents taken in combination (alcohol, cocaine, serotonin agents)

Increase in presentations to EDs with spectrum of serotonin toxicity (mild to lethal)

Need for RAPID diagnosis and therapeutic intervention

Current Toxbase advice is limited and time critical intervention(s) necessary

Diagnosis



The above flow diagram is formed from the Hunter Serotonin Toxicity Criteria (sensitivity is 84%, specificity 97%)

Mild toxicity – tremor, mild agitation, afebrile

Moderate – agitation, hyper-reflexia, inducible clonus, agitation, pyrexial (>38 ^{o}C but <40 ^{o}C)

Severe – hypertonic, mental obtundation, hyper-pyrexia (>40 ^{o}C)

Investigations

Dictated by presentation

Mild toxicity – U&E, CK, glucose, venous gas, ECG

Moderate – U&E, FBC, LFTs, Ca, Coag, CK, ABG, glucose, ECG

Severe - U&E, FBC, LFTs, Ca, Coag, CK, ABG, glucose, ECG

Role of urine toxicology

- Does not change management (most NPS NOT detected)
- Helpful for surveillance of agents

Management

Most patients will require observation for at least 6 hours

Beware NPS – no toxicological data to guide treatment; some have effects for 24 hours

Mild Toxicity

Symptomatic relief with oral benzodiazepines

Moderate Toxicity

- IV benzodiazepines for agitation; frequent dosing but monitor for respiratory depression
- Cooled IV fluids (1 to 2 litres 0.9% NaCl)
- Oral cyproheptadine (serotonin antagonist, unlicensed indication) 12mg initially, followed by 2mg every 2 hours or 8mg every 6 hours
- Cooling e.g. cold showering, ice packs

Severe Toxicity

- RAPID cooling vital – cover body in ice (ice packs in groin and axilla not effective)
- IV benzodiazepines for agitation and muscle hypertonicity
- Cooled IV fluids (1-2 litres of 0.9% NaCl)
- RSI and ET intubation with muscle paralysis
- Consider chlorpromazine 25mg IM (blocks serotonin, dopamine, histamine, acetylcholine receptors) AFTER fluid administration due to hypotensive effects
- Cold bladder lavage
- Nasogastric tube and crushed cyproheptadine 12mg stat dose, 8mg every 6 hours

Important Points

Antipyretic agents have NO place for pyrexial patients

Dantrolene has no effect in serotonin toxic patients

Mortality is significantly raised in patients with a temperature >40 ^{o}C

Cyproheptadine and chlorpromazine are unlicensed for this use

Cyproheptadine and chlorpromazine treat the symptoms but do not alter mortality (thus far)

Acute kidney injury, liver failure, disseminated intravascular coagulation, rhabdomyolysis are complications associated with moderate to severe serotonin toxicity

Toxicological studies of Novel Psychoactive Substances are extremely limited

Novel Psychoactive Substances have a greater duration of effect that ecstasy