Anticholinergic Poisoning

Presented

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Introduction

- Nervous system divide into central and peripheral.
- Autonomic nervous system is a part of peripheral nervous.
- Autonomic nervous system divide into **parasympathetic** (cholinergic) and **sympathet**ic nervous system (adrenergic).
- Cholinergic nerve (parasympathetic nerve) is stimulated by acetylcholine that is inactivated by acetyl-cholinesterase enzyme.

Acetylcholine neurotransmitter acts on two receptors:-

- **First receptor :** Peripheral receptor (**Muscarinic**).

It is found in the heart, bronchi, sweat glands, git, urinary tract and blood vessels

- **Second receptor:** Central receptor (**Nicotinic**).

It is found in high centers, reticular activating system and skeletal muscles.

Anticholinergic drugs

- Many drugs and various plants species contain anticholinergic properties by inducing competitive inhibition of acetylcholine at receptor sites.

So, it is called an anticholinergic drugs or agents such as:-

1. Anti-parkinsonism drugs
2. Anti-psychotic drugs
3. Anti-histaminic drugs
4. Anti-spasmodic drugs
5. Cyclic anti-depressant drugs
6. Skeletal muscle relaxants
7. Datura stramonium and Atropa belladonna
8. Nutmeg
9. Mushroom
10. Hyoscyamus niger.

Clinical Picture of Anticholinergic Poisoning

Anticholinergic poisoning manifestations (**toxidrome**) divide into:-

A- Nicotinic Central Manifestations:-

Agitation, anxiety, delirium, confusion, hallucinations (auditory, visual, tactile), incoherent speech, psychosis, seizures, coma, respiratory failure and cardiovascular collapse

B- Muscarinic Peripheral Manifestations:-

Dry mouth and skin (a decrease in secretions of salivary and sweat glands), flushing (dilated blood vessels), dilated pupil, tachycardia, hypertension or hypotension, arrhythmia, urinary retention, constipation and fever.

Diagnosis

Diagnosis

It should be based on recognition of signs and symptoms of characteristic anticholinergic toxidrome.

Investigations

1. E.C.G
2. Serum electrolytes assay should be done to assess the condition of the patient

- Serum drug level is not available.

Treatment

- **Treatment depends on condition of patient and signs and symptoms.**

1- Life-Saving Measures (Complications and Coma)

Airway, Breathing and Circulation (ABC)

A- Airway : Suction of secretions and removing any foreign bodies to become clear for passing the oxygen.

B- Breathing: Humidified oxygen supply via face mask, nasal cannula or endotracheal intubation and ventilator in severe cases.

C- Circulation: Monitor blood pressure, pulse and heart.

Symptomatic Treatment

Symptomatic treatment is carried out according to the presenting clinical picture:-

1. IV benzodiazepine → Agitation and seizure
2. IV anti-arrhythmic drugs → Arrhythmia.

- The most cases of anticholinergic poisoning may be responded to supportive care.

Git Decontamination

- It should be performed immediately but it may be done too late because of delayed absorption from git in cases of anticholinergic toxicity.

1- **Ipecac** to induce emesis for conscious patient

2- **Gastric lavage** if emesis is failed or Comatose patient.

- Cuffed endotracheal intubation should be used during lavage for comatose patient.

3- **Activated charcoal**: repeated doses should be used after lavage or emesis to adsorb the remaining anticholinergic agent but it is contraindicated in cases of ileus.

4- **Catharsis** may be used in some cases to clean git completely by inducing diarrhea.

Antidote

Physostigmine

Indications

1. Severe central anticholinergic poisoning
2. Supraventricular arrhythmia resistant to beta blockers drugs and intractable convulsions.

Action

Inhibition of cholinesterase enzyme (parasympathomimtic effect).

Dose

Adult dose : 1-2 mg by a slow infusion for 5 minutes and may be repeated every 10 minutes until the case is improved.

Maximum dose should not be exceeding 4 mg every ½ hour

Child dose : 0.02-0.06 mg/kg .

Antidote

Contraindications

A- Absolute

Cyclic antidepressant drugs toxicity

B- Relative

1. Asthma,
2. Mechanical obstruction of gastrointestinal tract Gangrene
3. Cardiovascular disease.

Side effects

1. Bradycardia
2. Cholinergic crisis,
3. Seizure and asystole

- It can be treated by glycopyrrolate administration.

Thank you