MUSHROOM POISONING

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Epidemiology

- There are no easily recognizable difference between nonpoisonous and poisonous mushrooms.
- Mushroom toxins are not heat labile

- Are not destroyed or deactivated by cooking, canning, drying, or other means of food preparation
- Mushroom ingestion + any kind of symptoms= addmition

Early-onset GI symptoms

- Most wild mushroom ingestion cause mild GI symptoms
- *Chlorophyllum molybdites*, *Omphalotus, Boletus, Entoloma, Gomphus, Hebeloma, Lactarius, verpa*

- *C. molybdites* can cause sever GI symptoms
- Acute onset of vomiting and diarrhea, intestinal cramping, chills, headaches, and myalgia
- Usually resolve within 24 hours

Chlorophyllum molybdites

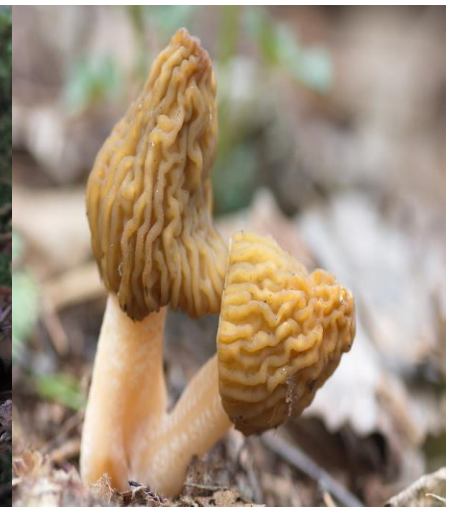
Omphalotus

Boletus

Entoloma

Gomphus *Hebeloma* *Lactarius* *verpa*



Treatment:

- Activated charcoal 0.5-1 gram/Kg
- Supportive care
- Antiemetics (DO NOT give antidiarrhea agents)
- No need for prophylactic decontamination in asymptomatic patients

Take care!!!

- Some cases of *Amanita simithiana* ingestion present with early GI symptoms and can progress to renal failure within 3 to 5 days

- Do not discharge until symptoms resolution and PO tolerance
- Recommend outpatient follow up within 5 days
- Provide return precautions (urinary changes, back or flank pain).

Amanita simithiana

Early-onset neurologic symptoms

- Several classes of mushrooms can cause neurologic symptoms
- MAGIC MUSHROOM!!! (psilocybin)
- Acts like LSD

- Mushrooms with Isoxazole derivatives (ibotenic acid, muscimol)
- *Amanita muscaria, Amanita pantherine*

Psilocybin

Amanita muscaria & Amanita pantherine

Clinical features

- Psilocibine containing mushrooms:
- Euphoria, heightened imagination, loss of the sense of time, visual distortions, and hallucinations

- Tachycardia or hypertension due to phenylethylamine

- Fever and seizure are rare

- Isoxazole containing mushrooms:
- Muscarinic poisoning symptoms appear first
- Nausea, vomiting, diarrhea, vasodilation, diaphoresis, salivation

- Anticholinergic (atropine-like) symptoms comes next
- Mydriasis, xerostomia, elevated temperature, increased BP, drowsiness, amentia, dizziness, photosensitivity, euphoria, motor hypersensitivity, ataxia, muscle jerking, hallucination, and delirium.

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Treatment:

- Supportive care
- Benzodiazepines if sedation needed
- DO NOT give anticholinergic agents
- Seizures should treated with benzodiazepines
- Activated charcoal

- Use physostigmine ONLY for patients with SEVER anticholinergic symptoms (1-2 mg IV).

Early-onset muscarinic symptoms

- *Inocybe, Clitocybe* genera

- Muscarine is a parasympathomimetic agent.
- Muscarine is not graded by cholinesterase.

Clitocyb & Inocyb

Clinical features

- SLUDGE syndrome
- S : salivation
- L : lacrimation
- U: urination
- D: defecation
- G: GI hypermobility
- E: emesis

Treatment:

- Atropine (0.5-1 mg IV, dose can be repeated if necessary)

- Supportive care (antiemetics, IV fluids, Oxygen and inhaled B-agonists for patients with increased pulmonary secretions)

Delayed-onset GI symptoms

- *Gyromitra* genera and *Amanita* genera:
- *Gyromitra esculenta*
- *Amanita phalloides*
- *Amanita bisporigera*

- *Amanita* genus are responsible for 95% of mushroom related deaths

Gyromitra:

Amanita phalloides

Amanita bisporigera

Pathophysiology

- Gyromitrin (N-methyl-N-formylhydrazone): is volatile and heat-labile!
- After hydrolyzation binds to pyridoxine and interfere with enzymes
- Convert to a free radical in liver, cause local hepatic necrosis

- Phallotoxin and amatoxin:
- Phallotoxin alters enterocyte cellular membrane. It is limited to GI tract
- Amatoxin cause prolonged toxic effects. Cause free radical formation
- Damage cells with rapid protein synthesis and turnover: GI, liver, kindey

- Gyromitrin cause hepatocellular damage and interstitial nephritis

- Amatoxin cause fatty degeneration of liver, with intracellular collection of lipids and extensive hepatic necrosis.

Clinical features:

- Gyromitrin:

- Intense GI signs and symptoms
- Hypovolemia
- Hepatic failure
- Hypoglycemia
- Neurologic symptoms (dizziness, headache, seizure, incoordination, and muscle crams)

Clinical features:

- Amatoxin:

- Gastroenteritis
- Hypovolemia and electrolyte disturbance

- 4 stages toxicity

4-stages toxicity:

- Stage 1: asymptomatic for first 24 hour
- Stage 2: GI symptoms: intense cramping abdominal pain, Nausea, Vomiting, diarrhea, RUQ pain.
- **Liver function tests are normal**
- Stage 3: convalescent stage: symptoms subsides, liver enzymes rise.
- Stage 4: hepatic failure (dramatic hepatic enzymes rise, hyperbilirubinemia, coagulopathy, hypoglycemia, acidosis, hepatic encephalopathy, and hepatorenal syndrome)
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Diagnosis:

- Gyromitrin toxicity diagnosis is clinical

- Amatoxin toxicity diagnosis is clinical but Meixner colorimetric test can show amatoxin presence.

Treatment:

- Activated charcoal
- Monitoring for hypoglycemia
- Treatment of hepatic failure
- Treatment of renal failure
- Treatment of coagulopathy
- liver transplantation

Gyromitrin specific treatment:

- Treat neurologic symptoms with high-dose pyridoxine (25mg/kg IV)
- No specific treatment for hepatic damage

Amatoxin specific treatment

- Multidose activated charcoal
- Silybum marianum (5mg/kg loading over 1 hour, followed by 20mg/kg/day for 6 days)
- N-acetylcysteine (150 mg/kg over 1 hour, then 50 mg/kg over 4 hours, Then 100 mg/kg over 16 hours)
- High-dose penicillin G and ceftazidime

Delayed-onset renal failure

- *Cortinarius* genera (*C. orellanus, C. speciosissimus, C. gentilis*)
- Orellanine and ortinarin

- *A. smithiana*
- Allenic norleucin & chlorocrotylglycine

C. Orellanus

C. speciosissimus

C. gentilis

Clinical features

- GI symptoms heralds the toxicity
- Paresthesia
- Abnormal taste
- Cognitive dysfunction
- Flank or lumbar pain
- Oliguria (or polyuria in some cases)

Treatment

- No specific treatment
- Hemodialysis in:

1. refractory hyperkalemia,
2. refractory acidosis,
3. uremic symptoms,
4. sever renal dysfunction

- Renal transplant if spontaneous resolution does not accure in several months

Questions???

Thank you!!! ☺