Topic 19: Other Conditions Dealing with Medical Mycology

Other Important Conditions Associated with Medical Mycology

1. Inhalation of fungal materials to initiate allergy*

2. Ingestion of fungal materials such as mushrooms which produces mushroom poisoning**

3. Ingestion of food products contaminated with fungal toxins

*** mycotic allergies (mold allergies)**
**** mycetismus (mushroom poisoning)**
*****mycotoxicosis (mold toxin poisoning)**

Allergic Conditions

Hypersensitivity to common molds

1. sensitivity in usually atopic individuals (underlying hereditary basis). Usually to low number of allergens*,**

2. sensitivity in individuals chronically exposed to large numbers of allergenic fungal particles. e.g. Farmer's Lung

***asthma-type symptoms - seasonal (fall & spring in Texas; type I hypersesitivity**

1)	***Alternaria***	
2)	***Helminthosporium***	
3)	***Drechslera***	**all**
4)	***Cladosporium***	**form-**
5)	***Hormodendrum***	**genera**
6)	***Penicillium***	**(anamorph names)**
7)	***Aspergillus***	

****usually IgE mediated**

Low dose mold asthmas

1. Childhood type - reaches peak in early adolescence, then subsides

2. Adult - severe form that begins most often at ~ >40 yrs. Progressive → emphysema-like induced death at extreme

Chronic large dose

1. **Farmer's Lung - moldy hay***
2. **Bagassosis - sugar cane residue****
3. **Byssinosis - cotton dust****
4. **Lycoperdosis - puff balls & snuff***
5. **Maple bark strippers disease, etc. molds growing under bark***

***mold conditions**
****and its molds**

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1. Farmer's Lung

a. ***Aspergillus* sp. e.g., *A. fumigatus***
***A. niger* & *A. flavus*, etc.**

b. ***Penicillium sp****
P. simplicissmum
P. herquei
P. rubrum
P. italicum
P. caseiocolum

c. other form-species
Species not regular air contaminants. Usually thermotolerant species found growing on decaying plant material in barns, storage areas or wet fields, also in compost.

****Penicillium marneffei*, agent of AIDS-related mycosis in SE Asia. See RR (on AIDS-related penicilliocis)**

Mushroom Poisoning
(Mycetismus)

A. Symptoms after ingestion
1. minor gastrointestinal distress
2. hallucinations
3. delirium
4. coma
5. death

B. Causes - many species
1. mostly Holobasidiomycotina of order Agaricales, class Holobasidiomycetes (syn. Hymenomycetes)
2. even a few Euascomycota - Discomycetes

C. In U.S. -
- mostly children (accidental) or -young adults looking for "highs"
- foreigners or recent immigrants (mycophiles):
  most U.S. citizens are mycophobes*

***English (British) legacy. (mycophobia)**
"kickers" vs "pickers"!

Types of Mushroom Poisonings

1. Cyclopeptide poisonings*
2. Monomethyhydrazine poisonings
3. Coprine poisonings
4. Muscarine poisonings
5. Ibotenic acid & musamiol poisonings
6. Psilocybin & other indol poisonings
7. Gastroentestinal irritant poisonings
8. Mushroom alcohol sensitivity

***most common and most serious:**

Amanita (death caps)^{0}	volva -- white spores
Lepiota^{00}	no volva -- white spores
Conocybe^{000}	brown spores**
Galerina^{000}	

^{0}at best not recommended/not edible & at worst, deadly poinsonous
^{00}some edible and delicious, others poisonous
^{000}not recommended/poisonous

****adage "don't eat small brown mushrooms: may relate to these**

General Clinical Course

1. **Symptoms begin after 8 - 12 hours**
   indicating phallotoxins may be eliminated (degraded) in humans before cause problems.
2. **Nausea, vomiting, cramps, severe diarrhea**
3. **After 2 - 3 day gastrointestinal phase subsides (more quickly with fluid & electrolyte substitution)**
4. **Around day 5 (onset of severe necrosis of liver cells) with release of diagnostic enzymes (alkaline phosphatase*)**,*****

* **effect of α amanitin→inhibits RNA polymerase II****

****terminates protein synthesis (at transcriptional level)**
****also associated with clotting deficiency**
*****often only treatment is a liver transplant**

Mortality Rates

~ 50% in children below age 10

~ 16% or less among older

overall, ~ 20%

-rate related to amount of mushroom ingested vs size of ingestor

-therapy = fluid replacement; liver transplant

-most treatments not real good:

1) **but better if w/in 1-2 to 4-6 hrs., empty stomach by ipecac emesis* & gastric lavage with activated charcoal and try to clean blood**
   a) haemodialysis b) haemoperfusion**
   c) apheresis***
2) **increase excretion of toxin**
3) **supportive measures - Pen G (@300-1,000K units/kg/day), throcytic acid, etc.**
4) **Bastion Method - vit. C, etc.**
5) **monitor alkaline phosphotase for liver enzymes & liver function/destruction**

***induced vomiting**
**** cleaning patient's blood with activated charcoal, after which it is returned**
***** separation of patient's blood into components, after which only portion ("cleansed") is returned**

Mycotoxicosis - mold toxin poisonings of humans and animals

1. **Mycotoxicoses are not transmissible**
2. **Drug and Antibiotic treatment have little or no effect on the disease.**
3. **In field outbreaks, the trouble is often seasonal.**
4. **The outbreak is usually associated with a specific food or feedstuff.**
5. **The degree of toxicity is often influenced by the age, sex and nutritionals state of the host.**
6. **Examination of the suspected food or feed reveals signs of fungal activity.**