Angiostrongyliasis (Rat Lungworm Disease)

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What It Is

- Parasitic infection caused by Angiostrongylus cantonensis
- The most common cause of eosinophilic meningitis in humans
- Mainly affects the brain + spinal cord

Hosts

- Definitive hosts - Rats
- Intermediate hosts - Snails and slugs
- Accidental host - Humans

How Humans Get Infected

- Eating raw/undercooked snails or slugs
- Eating contaminated produce (tiny snails/slugs)
- Eating certain paratenic hosts (frogs, prawns, etc.)
- Ingestion -> Infectious larvae -> Intestines -> Brain

Causative Agent - Key Features

- Parasitic nematode (roundworm)
- Slender, filiform body
- Female worm shows “barber-pole” pattern
- Adults live in rat pulmonary arteries

Larval Stages

- L1 - Shed in rat feces
- L2 -> L3 - Develops in snails/slugs
- L3 - Infectious to humans
    - In humans - L3 -> Brain -> Dies -> Inflammation

Why Does It Cause Eosinophilic Meningitis

- Humans = Dead-end hosts
- Larvae reach CNS -> die -> Immune system floods area with eosinophils
- Leads to meningitis, headaches, neck stiffness, nerve deficits, and severe inflammation

Signs and Symptoms

- Average incubation period 1-3 weeks
- Asymptomatic or mild symptoms
- Can cause eosinophilic meningitis:
- severe headache, stiff neck, fever, nausea, vomiting, confusion, lethargy, hypersensitivity to touch, including burning pain with itchiness.

Historical Notes

- First observed in rats by Professor H.T. Chen (1933)
- Formally named *Pulmonema cantonensis* in 1935
- 1944 - First human case in Taiwan (eosinophilic meningitis)
- 1950s-1960s - Life cycle mapped; identified as major cause of eosinophilic meningitis

Treatment

- No confirmed treatment
- Symptoms can be treated
    - Analgesics for pain and corticosteroids to treat inflammation
    - Cerebrospinal fluid can be removed to relieve headaches
- Anthelmintics were proposed as a treatment
    - Drugs designed to kill worms/parasites
- Ultimately, not approved for treatment
    - Could worsen symptoms
    - Depends on the region
    - No evidence regarding any added benefit
- Parasites will die over time, even with no antiparasitics

Global Distribution and Risk Factors

- Mainly in Southeast Asia and the Pacific Basin
    - Mostly Thailand and China
- Expanded to the United States, Australia, and Europe
- Risk Factors
    - Eating undercooked/raw slugs and snails
    - Eating contaminated produce
    - Indirect contact in environments infested with hosts

Prevention

- Educate to not eat snails/slugs in endemic regions, along with shrimp, crabs, frogs, monitor lizards, or potentially contaminated produce
- Removing slugs, slimes, and rats from gardens
- Thoroughly washing utensils and hands after handling slugs and snails
- Washing vegetables well