Drug therapy of Filariasis

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Signs and symptoms

*Lymphatic filariasis*

- Fever
- Inguinal or axillary lymphadenopathy
- Testicular and/or inguinal pain
- Skin exfoliation
- Limb or genital swelling - Repeated episodes of inflammation and lymphedema lead to lymphatic damage, chronic swelling, and elephantiasis of the legs, arms, scrotum, vulva, and breasts.
Filariasis

The following acute syndromes have been described in filariasis:

- Acute adenolymphangitis (ADL)
- Filarial fever - Characterized by fever without associated adenitis
- Tropical pulmonary eosinophilia (TPE)
Drugs used in treatment of filariasis

- Diethylcarbamazine
- Ivermectin
- Albendazole
- Doxycycline
Diethylcarbamazine

Therapeutic action
- Antihelmintic
- Drug of choice for lymphatic filariasis
Diethyl Carbamazine

Indications

- Filariasis
  - W. bancrofti
  - B. malayi
- Tropical pulmonary eosinophilia
- Loa loa
Diethyl Carbamazine

Mechanism of action

- Alteration of organelle membranes of microfilariae promoting cell death
- Also muscular activity is affected
- Prolonged treatment may kill adult worms
- Also enhances Cell mediated immunity
Diethyl Carbamazine

Presentation

- 50,100mg tablets
- 120mg, 50mg syrups

Dosage

- Adult: 2mg/kg three times a day
Diethyl Carbamazine - Efficacy

FILARIASIS

- 2mg/kg TDS produces rapid symptomatic relief and
- Microfilariae disappear from blood in 7 days
- Patient becomes non-infective
- Adult worms survives in lymphatics
- More than one course may be needed with a gap of 3-4 weeks
Tropical pulmonary eosinophilia (TPE)

- Symptoms result from allergic and inflammatory reactions elicited by the microfilariae and parasite antigens that the lungs clear from the bloodstream
- Typical mottling in the lungs, fever, anorexia, attacks of dyspnea resembling bronchial asthma
- Leukocytosis and marked eosinophilia more than 3000/cmm
- DEC in doses of 6mg/kg daily for 7-10 days is highly effective
Diethyl Carbamazine - Efficacy

ELEPHENTIASIS

- Is due to chronic lymphatic obstruction and not affected by DEC
- Single dose treatment with a combination of DEC 6mg/kg and Albendazole 400mg once a year on mass scale
- Brings down transmission
Diethyl Carbamazepine

Adverse effects

- Gastric discomfort
- Loss of appetite
- Headache
- Dizziness
- Weakness
Diethyl Carbamazine

Adverse effects

- Febrile reaction
  - Due to mass destruction of microfilariae and adult worms
  - Rash, pruritus, enlargement of lymph nodes, bronchospasm
  - Can be minimized by starting with a low dose of 0.5mg/kg
  - Stop DEC temporarily, treat with antihistaminic and steroids
  - Can restart once again
Ivermectin

Therapeutic actions

- Antinematodal drug obtained from *Streptomyces avermitilis*
- Comparable to DEC for bancroftian and brugian filaria
- Microfilaricidal but not macrofilaricidal
Ivermectin

Indications

- Single dose treatment of onchocerciasis and Hook worm infection
- Cutaneous larva migrans
- Oral drug effective for Scabies and pediculosis
Ivermectin

Mechanism of Action

- Nematodes develop tonic paralysis
- Act through special type of glutamate gated Chloride channel found only in invertebrates
- Also potentiate GABA ergic transmission
- Ivermectin does not cross blood brain barrier in humans
Ivermectin

- Well absorbed orally with peak serum time of 4 hours
- Does not cross blood brain barrier
- Metabolized by liver and excreted in faeces
- It has GABA agonistic activity – do not combine with CNS depressants
Ivermectin

Presentation

- Tablets of 3 and 6mg
Ivermectin

Dosage in filariasis

- Single dose of 100-200mcg/kg is highly effective against microfilariae
- Ivermectin 10-15 mg with albendazole 400mg given annually for 5-6 years in endemic areas of filariasis
Ivermectin

Dosage in onchocerciasis

- Single dose of 150mcg/kg in treatment of onchocerciasis
- Repeat the dose after 6-12 months for 10-14 years
- Single dose of 400mcg/kg if onchocerciasis and loasis coexist
Ivermectin

Adverse effects

- Reaction to degenerative products of microfilariae
- Pruritus and Dizziness,
- Transient ECG changes may occur
Ivermectin

Adverse effects

- Mazotti Reaction to degenerative products of microfilariae
- Ocular inflammation occurs and may lead to blindness
- Severe reaction can be controlled by 5% hydrocortisone drops
- Prior antihistaminic and steroids to be given to minimize systemic allergies
Doxycycline

- 200mg/day for 6 weeks causes long term sterilising effect in brancoftian filariasis
- Inhibits wolbachia bacteria which live in symbiosis with microfilariae
- Growth, reproduction and survival of adult worms depends on wolbachia
Doxycycline

- Nor a drug of choice for filariasis nor for mass treatment
- Used to treat individual cases
- Contraindicated in children and pregnant women
Mansonelliasis infection

- Usually asymptomatic and considered as minor filariasis
- Diethylcarbamazine is ineffective
- Long term doxycycline 200 mg daily for 6 weeks is reported to be effective
Summary

- Diethylcarbamazine – DOC for lymphatic filariasis
- Ivermectin – DOC for onchocerciasis
- Albendazole – used for mass treatment along with DEC and ivermectin
- Doxycycline – long term sterilizing effect in bancroftian filaria