Successful Eradication of Furmites and Pinworms from Mice with a Four-Week Ivermectin Treatment Regimen

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Introduction

- Eight weeks of continuous ivermectin treatment is most often recommended for fur mite and pinworm eradication.
- Since ivermectin is effective against both adult parasites and ova, a shorter regimen should also successfully eradicate parasite infections.
- A shorter regimen would offer significant cost savings in terms of supplies and labor and enhance research productivity.
- A study was performed to evaluate effectiveness of a 4-week ivermectin treatment regimen in eradicating mouse fur mite and pinworm infections.

Methods

MICE
- SENCAR outbred mice naturally infected with fur mites and pinworms
  - *Myocoptes musculinus* and *Myobia musculi*
  - *Aspiculuris tetraptera* and *Syphacia obvelata*
- 60 female mice: 30 mice were 4-5 wks old and 30 mice were 3-4 mo old

STUDY DESIGN
- Mice were divided into 3 groups of 20 and housed 2 per cage
  - cages housed in a negative-pressure ventilated microisolator rack
  - irradiated food, sterile bedding provided at each cage change (2 wks)
  - sterile acidified water for controls and mice that completed treatment
- Treatment Groups: 5 cages of young mice and 5 cages of adult in each group
  - Group 1: 8 wks on ivermectin
  - Group 2: 4 wks on ivermectin
  - Group 3: untreated controls
- Ivermectin provided in a gel containing 12 ppm ivermectin in a 4 oz cup
  - gel used in place of a water bottle
- Fur and fecal sample collection:
  - Traditional antemortem tests: fur plucks, fecal flotation, perianal tape tests
  - PCR samples: fur swabs (head, body, perianal area) and feces
  - Traditional postmortem tests (study end): pelts and cecocolonic contents exams
- Collection Schedule:

Results

- FUR MITE TEST RESULTS
  - No difference in mite species or burden between young and adult mice at day 0.
  - Test results from young and adult mice combined

- FUR PLUCK RESULTS
  - Mites undetected by 4 wks in treated mice.
  - Nits observed until 12 wks; none hatched.

- MITE PCR RESULTS
  - PCR detected mite DNA through 12 wks

- PINWORM TEST RESULTS
  - On day 0 in all age groups, young mice shed only *Syphacia ova* & adult mice shed only *Aspiculuris ova*.
  - By wk 2 of the study, both age groups of control mice shed pinworm ova similarly.
  - Test results reflect results from young and adult mice combined.

- PINWORM OVA SHEDDING - CONTROLS
  - *Syphacia* ova shedding declined over time.

- PINWORM TAPETEST & FLOAT RESULTS
  - Pinworm ova undetected by 4 wks in treated mice.

- PINWORM PCR RESULTS
  - Pinworm DNA not amplified after 4 wks

ADDITIONAL RESULTS:
- Four mice exhibited mild tremors after 24 hr on treatment and were replaced with similarly-aged infected mice; no other abnormal signs were observed throughout the study.
- All treated mice were parasite-free at the end of the study.
- All control mice were infected with *Myobia, Myocoptes* and *Aspiculuris*, but not *Syphacia*, at the end of the study.

Conclusions

- 4 weeks of ivermectin treatment eliminated mite and pinworm infections.
- Use traditional parasite exams to monitor efficacy for the first month post-treatment.
- Use PCR assays to pre-screen mice prior to start of treatment and for routine health monitoring.