Older Sentinel Mice are as Susceptible as Young Mice to Murine Pathogens Transmitted by Dirty Bedding
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Introduction
Current diagnostic technologies allow samples collected from live mice to be tested for a comprehensive panel of disease agents. Because of these refinements, sentinel mice do not have to be euthanized and their use as sentinels could be extended, saving costs and reducing numbers of animals used for health monitoring programs.

Caution in use of older sentinel mice stems from age-related resistance to infections with pathogens including MPV and parasites1,2. Little has been published on successful use of older sentinel mice in detection of disease through exposure to dirty bedding.3

To further address this question, a study was designed to expose disease-free ICR mice of two ages, 4-5 wks and 4-5 mo of age, to dirty bedding from source mice infected with a variety of infectious agents, including Helicobacter, parasites, MPV and MHV. Samples collected from sentinel mice over 12 wks were tested to determine acquisition of infections.

Methods

Dirty Bedding Preparation

Infected Bedding Source
Mice colonized with Helicobacter ganmani, H. typhlonius, pinworms, furmites and Pasteurella pneumotropica
- 1 mouse inoculated with MPV1e + 3 unoinoculated mice in cage 1
- 1 mouse inoculated with MHVwt + 3 unoinoculated mice in cage 2
- Samples from source mice monitored for shedding of all pathogens by PCR.

Dirty Bedding Mix
- One part of infected bedding from cages 1 and 2
- 16 parts of uninfected soiled bedding from mouse colonies free of rodent pathogens

Sentinel Mice
- Nine cages of 4-5 wk-old and of 4-5 mo-old CD-1 female sentinel mice housed 2 per cage
- Every 2 weeks, sentinel mice bedded with the dirty bedding mix
- Samples from sentinel mice collected weekly for 2 wks and monthly thereafter
- Serology and PCR performed to screen for evidence of infection

Results

Infectious agents were present in feces for up to 12 wks.

Old mice acquired viral infections as well as young mice. All mice had seroconverted to MHV and MPV by study end.

Old mice were susceptible to bacterial and parasitic infections.

Timeline for Disease Monitoring from Sentinel and Source Mice

Blood, swabs and feces collected from sentinel mice

Blood, swabs and feces collected from sentinel mice

blood, swabs and feces collected from source mice

swabs and feces collected from source mice

Conclusions

No differences in infection rates between old and young mice.

Sentinel mice may be used for 12 wks of monitoring without concerns of resistance to infection by murine prevalent pathogens.
- Reduces number of sentinel mice
- Reduces costs in a health monitoring program

References:
2. The Mouse in Biomedical Research, 2006; Vol. 2, Chpt. 22; Elsevier, San Francisco