

Mouse Rotavirus (EDIM - Epizootic Diarrhea of Infant Mice)

Prevalence

- Highly contagious and common amongst both laboratory and wild mice.

Significance

- Can alter results of studies with infant mice
- Alter host physiology – increase susceptibility to pathological effects of co-pathogens
- Modifies intestinal absorption and concentrations of intestinal enzymes

Disease

- Non-enveloped, RNA virus
- EDIM is a single strain of many viruses of group A rotaviruses isolated from mice
- Mice of all ages susceptible – only mice younger than 14 days show clinical signs:
 - Diarrhea - watery, yellow stools 48 hours after infection that persist up to 1 week after
 - Steatorrhea with oily hair
 - Bowel flaccid and distended with fluid and gas
 - Obstipation due to faecal caking around anus
 - Severe stress-related thymic necrosis
- Clinical signs of EDIM typically occur in naïve breeding populations – once enzootic within colony, disease no longer apparent, virus remains
- Virus selectively infects terminally differentiated enterocytes of villi and surface mucosa of small and large intestine – malabsorptive effects accompanied by *E. coli* overgrowth
- During first few days – fluid accumulation and dilation of small intestine

Transmission

- Orofaecal route (shed copiously in faeces)
- Direct contact with infected mice and contaminated bedding
- Aerosol
- Adult mice shed virus to susceptible young

Diagnosis

- Presumptively - on basis of age, clinical signs, and lesions
- **Preferred** – Serology for EDIM virus antibody useful for surveillance and retrospective confirmation (ELISA)
- RNA can be detected by PCR
- Antigen can be detected in faeces by ELISA
- Electron microscopy of intestinal mucosa or faeces

Strains

- Multiple strains have been identified
- Rotavirus A group encompasses many viruses which has relative host specificity (interspecies infection can be shown experimentally with high doses of inocula)

Duration

- Mice infected about 17 days of age – shed lower concentrations of virus
- Virus shed in faeces for about 10 days post-infection - not known whether infection is persistent or whether low concentrations of virus continue to be shed

Durability

- Readily destroyed by:
 - disinfectants - phenols, chlorine, and ethanol
 - treatment with calcium-chelating agents (e.g. EDTA)
- Resistant to:
 - low pH - although virulence will decrease on prolonged exposure)
 - 5% chloroform, 20% ether or 0.1% sodium deoxycholate at 4°C for 60 mins
 - non-ionic detergents
 - high concentrations of proteolytic enzymes

Screening

- Routine monitoring of colonies.

Prevention and Control

- Rederivation through hysterectomy or embryo transfer
- Filter top cages can be beneficial
- Materials in contact with animals – autoclaved or cold sterilized
- Environment chemically decontaminated – detergents and oxidizing agents
- Eradication – cull colony and obtain replacement stocks from sources know to be disease free

Reading

- Stephen W. Barthold, Stephen M. Griffey, & Dean H. Percy. Pathology of Laboratory Rodents and Rabbits (Fourth Edition), 2016
- Infectious Diseases of Mice and Rats. National Research Council, 1991
- Charles River Laboratories website, www.criver.com
- University of Missouri, Research Animal Diagnostic Laboratory website, www.radil.missouri.edu
- Mouse Rotavirus (Epizootic Diarrhea of Infant Mice or EDIM). Division of Animal Resources, University of Illinois, Urbana