Case 16

Enteritis and amyloidosis of Indian rhesus macaque

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A 5.7-year-old, 5kg, female Indian rhesus macaque (*Macaca Mulatta*). The monkey was part of SPF breeding colony housed in indoor cages.

- Caged with an infant, both with diarrhea.
- BCS 2/5, moderate dehydration, perineum stained with copious feces.
- Suspect campylobacter diarrhea 1/21/14. On 1/24 hypothermic, hypoglycemic, and obtunded.
- There was no improvement in spite of antibiotic treatment.
The animal showed thin body condition and muscular atrophy. Both eyes were sunken.

The pancreas was pale and edematous.

The small intestine, cecum and colon were extremely dilated with large amount of fluid, blood-tinged fecal material.

The mesenteric lymph nodes were edematous and 5x enlarged.
Laboratory Results

- **Hematology:**

  RBC $6.79 \times 10^6$/ul; Hgb 12.2 g/dl; Hct 39.0%; WBC $11.45 \times 10^3$/ul; **Neu 80.7%**; Ban 0%; Eos 2.0%; Bas 0.9%; Mon 6.4%; Lym 10.0%; Plt $659 \times 10^3$/ul 000; Rtc 0/ul

- **Pathogen detection:**

  Serum or EDTA blood testing for HVP2, MEASLES, SIV, SRV, STLV1, SRV2 by MFIA(Multiplexed Fluorometric ImmunoAssay) and PCR were negative. *Yersinia enterocolitica* were isolated from the colon 3 days prior to the necropsy.
Bacteria are Gram-negative.
Histopathology

Diffusely the submucosa and serosa are mildly to moderately expanded by edema with many inflammatory infiltrates.
Histopathology: perivasculitis. Multifocally, the blood and lymphatic vessels are dilated and surrounded by edema and many inflammatory infiltrates.
Histopathology

Vasculitis. Occasionally the tunica media of vessels is expanded and disrupted by inflammatory cells.
Histopathology

Amyloid. Diffusely the lamina propria is expanded and deposited by abundant amorphous, finely fibrillar to waxy hyalinized.
Hyalinized material is Congo red positive.

Apple-green
Morphologic Diagnosis and Etiology

1. Small intestine: Enteritis, necrotizing and suppurative, acute, diffuse, marked, with perivasculitis, vasculitis, and colonies of bacilli, etiology consistent with *Yersinia enterocolitica*, Indian rhesus macaque (*Macaca mulatta*).

2. Small intestine: amyloidosis, diffuse, moderate, Indian rhesus macaque (*Macaca mulatta*).
Comments

- *Yersinia* was a member of *Enterobacteriaceae*, which comprises of 17 species including three pathogenic species: *Y. enterocolitica*, *Y. pseudo tuberculous* and *Y. pestis*.

- *Y. enterocolitica* was a globally distributed gastrointestinal pathogen causing a variety of gastrointestinal problems. *Y. enterocolitica* was found more frequently than other species.

- Non-human primates appear to be sensitive to *Y. enterocolitica* and *Y. pseudotuberculosis* and many fatal cases of yersiniosis have been reported worldwide.
The differential diagnosis in nonhuman primates includes *Shigella*, *Campylobacter*, *Salmonella* and *E. coli*.

Amyloidosis in intestine is not a uncommon finding in nonhuman primates. The cause is unclear yet but it has been suspected with chronic inflammatory diseases, such as rheumatoid arthritis, collagen disease, and tuberculosis.

Amyloidosis in small intestine caused by *Y. pseudotuberculosis* has been reported both in human and non-human primate.
References


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