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Multiple peracute deaths in a colony of Syrian hamsters (*Mesocricetus auratus*)

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Animal care technicians at Georgia State University observed a series of peracute deaths in a colony of 210 Syrian hamsters. Thirty-five animals residing in three animal rooms (two rooms in one animal facility and one in another animal facility) under the direction of one principal investigator (PI) died suddenly: 25 of 103 hamsters in one room, 7 of 47 in another room and 3 of 60 in a third room. All the hamsters that died were male, even though 70 of the 210 hamsters in the colony were female, and they ranged in age from 1 to 11 months. The 210 hamsters were used in a behavioral study and had either direct (e.g., group housing) or indirect (e.g., shared procedural space and dirty bedding exposure related to the behavioral experiment) contact with one another. The PI responsible for these animals also maintained two other rooms of Syrian hamsters that had neither direct nor indirect contact with the aforementioned 210 hamsters; none of these hamsters experienced any peracute deaths. In addition, Syrian hamsters were maintained by other PIs in other animal rooms in both of these animal facilities, and none of these animals experienced such deaths. We recognized that there was a problem with the three animal rooms housing the hamsters that experienced peracute deaths. Therefore, we placed these rooms under quarantine.

Of the 35 hamsters that died, 30 had received no experimental manipulations, 3 had been castrated and implanted with brain cannulas 9 months before their deaths and 2 had been subjected to surgical lesions to a region of their forebrain 2 months before their deaths. None of the 35 hamsters had abnormal clinical signs before they were found dead in their cages. None of the hamsters in the colony had received previous antibiotic therapy. Moreover, no change in food, water or other husbandry procedures had occurred at any time preceding the hamsters' deaths.

The first 30 of the 35 hamsters that died were found dead during a period of 42 d. At this time, because of the many deaths, the PI euthanized 112 of the remaining 180 hamsters. This left 68 hamsters, 50 of which were used for terminal experimental purposes over the next 44 d. However, 5 more hamsters died peracutely, and 13 additional hamsters were euthanized. Once empty, the three animal rooms were decontaminated with chlorine dioxide and eventually repopulated with new hamsters. In the months since, no other sudden deaths have occurred.

Most of the dead hamsters had a full necropsy examination. All animals were well-fleshed and had partially digested food in the stomach. Some of the hamsters had formed fecal pellets in their gastrointestinal tract; others had diarrhea. Most animals had a moderate amount of gas in the gastrointestinal tract, extending from the stomach to the colon, and a hemorrhagic appearance to the serosal surface of the cecum (**Fig. 1**).

All hamsters (Crl:LVG(SYR)) were obtained from Charles River Laboratories. Georgia State University maintains a laboratory animal health surveillance program using sentinel animals exposed to dirty bedding. Up to the time of the sudden deaths, results from tests on these sentinels had not indicated the presence of any microbiological agents in the hamster colony other than adventitious agents that were present upon their arrival at Georgia State University (e.g., *Demodex* spp., *Helicobacter* spp. and *Giardia* spp.). The hamsters were maintained in standard polycarbonate shoebox cages with wire bar tops (no microisolator tops) and corncob bedding. Municipal tap water was provided *ad libitum* in a water bottle. The light:dark cycle was 14 h:10 h, and technicians supplied Purina Mills 5001 Rodent Diet as feed.

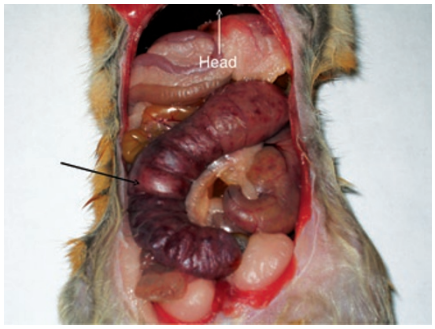

FIGURE 1 | Exposed *in situ* abdominal contents of a male Syrian hamster that died suddenly. The hemorrhagic appearance to the serosal surface of the cecum (black arrow) is typical of other hamsters that also died suddenly in a disease outbreak of unknown origin.

What are your differential diagnoses for the peracute deaths in this colony of hamsters? How common is this disease in hamsters?

What's your diagnosis?

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