Halicephalobus Infection in a Fatal Case of Encephalomyelitis

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Halicephalobus is a free living soil saprophytic nematode which can infect horses, zebras, and rarely, humans. Five cases of human infection with Halicephalobus have been reported in the literature [1 – 5], but no electron microscopic (EM) results have been published. We report here the first EM findings from a fatal human case of infection with Halicephalobus.

A female with encephalitis died 29 days after hospitalization. Histological examination of the brain revealed several nematodes, mostly larva, although a later stage larva/early adult worm was found and was morphologically consistent as being in the genus Halicephalobus. Halicephalobus specific and cephalob nematode specific PCR assays were performed on DNA extracted from unfixed frozen tissues, and sequence analysis of positive amplicons showed 99% identity with Halicephalobus spp. A formalin-fixed paraffin-embedded section was processed for EM, and EM examination was consistent with the finding of a nematode. The worm was up to 190 μm in length and up to 20 μm in diameter, with a long intestine, muscle fibers, an anus, and developing eggs and germinal cells (Figures 1-4). There was an area of vacant space between the cuticle of the worm and the parenchyma of the brain.

Some of the morphologic features which distinguish Halicephalobus from other nematodes such as Ascaris or Strongyloides include size and absence of lateral alae.

There is no antemortem test to detect this infection, and all human cases of Halicephalobus have been diagnosed postmortem. Regardless, anthelmintic treatments have been unsuccessful in other animals possibly due to a lack of sensitivity, or because the drugs cannot cross the blood-brain barrier [5].

References

Figure 1. *Halicephalobus*, between arrows, having a crescent shape. Bar, 10 μm. Figure 2. Internal structures, including intestine (*) with microvilli (arrows), intestinal cells (arrowheads), and muscle fibers (Mu). Bar, 2 μm. Figure 3. Anus (arrow), intestine (*), and intestinal cells (small arrows) of the worm. Bar, 2 μm. Figure 4. Germinal cells in ovary (arrows) and developing cells *in utero* (arrowheads). Bar, 2 μm.