

**OEDEMA DISEASE: APOPTOTIC PANCREATOPATHY?**

J.F. Edwards\* and T. Conner†

\*Department of Veterinary Pathobiology, College of Veterinary Medicine and Biomedical Sciences, Texas A&amp;M University College Station, TX and

†Food Safety Inspection Service, United States Department of Agriculture, USA

**Introduction:** Oedema disease is a common, post-weaning form of enterotoxigenic colibacillosis associated with an angiopathy in the brain and gut and a circulating exotoxin, Stx2e. An oedema disease lesion of the duodenum is commonly seen at slaughter.

**Materials and Methods:** Over a 3-day period, 15 randomly selected cases of oedema disease were sampled at slaughter (pancreas, duodenum, draining lymph node and liver) and these tissues were examined histologically. Pancreases were labelled immunohistochemically for caspase-3 and bcl-2 activity.

**Results:** All pigs had passed an ante-mortem inspection and had no other gross lesions. All cases had peripancreatic oedema, fat degeneration and serous inflammation. Although mild random inflammation was noted occasionally in a pancreas, suppurative pancreatitis, pleocellular pancreatitis and haemorrhage were notably absent, and the exocrine pancreas of all cases had severe pancreatic apoptosis with occasional early necrosis. Widespread angiopathy was not noted. Livers, lymph nodes and intestines were not affected.

**Conclusions:** The consistency of this lesion is startling. Apoptosis and cell-organelle dysfunction are key to the pathogenesis of pancreatitis, and the sequela of this lesion must be studied. Enteric exotoxins may have an unstudied role in pancreatitis in many species. Further, one wonders if humane handling during transport and slaughter may be involved, and more importantly, whether there are food safety issues to address with this condition.

**HAEMORRHAGIC SYNDROME IN CATTLE BY SUBGENOTYPE BVDV-1H**V. Di Marco Lo Presti\*, G. Purpari\*, E. Biasibetti†, M.T. Capucchio†, V. Cannella\*, P. Di Marco\*, F. Mira\*, G. Guarneri\*, M. Fiasconaro\*, B. Amato\* and A. Guercio\*  
\*Istituto Zooprofilattico of Sicily and †Department of Veterinary Sciences, University of Torino, Italy

**Introduction:** Bovine viral diarrhoea—mucosal disease (BVDMD) is caused by a Pestivirus. Two genotypes are recognized: BVDV-1 and BVDV-2. BVDV-1 causes diarrhoea, respiratory disorders and reproductive disorders. BVDV-2 causes a haemorrhagic syndrome. We describe several hypervirulent outbreaks characterized by severe haemorrhagic signs caused by BVDV-1 in Sicily.

**Materials and Methods:** Serological (ELISA) and virological tests (virus isolation on MDBK cell cultures and RT-PCR) for BVDMD were performed on sera, blood and organs. Moreover, assays for *Bacillus anthracis*, *Salmonella* spp., *Mannheimia* spp., IBR-virus and haematological tests were carried out. Tissue samples were also submitted for histopathological investigations.

**Results:** Cattle from 15 farms showed oral ulceration, mucopurulent to haemorrhagic nasal discharge, haemorrhagic diarrhoea, haematuria and petechiae. Ulcerative to haemorrhagic lesions occurred in the mouth, tongue, subcutaneous tissue and the gastrointestinal, vaginal and urinary tracts. Laboratory tests confirmed the presence of a cytopathic BVD strain. Phylogenetic analysis, performed on the 5'UTR region, characterized the strain within the subgenotype BVDV-1h. Thrombocytopenia was confirmed.

**Conclusions:** In Sicily, BVDMD is widespread. Previous studies have shown a low level of heterogeneity between strains indicating the presence of BVDV-1b and BVDV-1e. Usually, haemorrhagic syndrome is caused by BVDMD-2. This is the first isolation of the BVDMD-1h subgenotype associated with an outbreak of severe haemorrhagic disease in calves.

**Wildlife Disease****CENTRAL NERVOUS SYSTEM PATHOLOGY IN INFECTIOUS DISEASES OF CETACEANS STRANDED ON THE CATALAN MEDITERRANEAN SEA (1990–2013)**M. Isidoro\*, S. Soto\*, L. Pérez\*, X. Cabañes\* and M. Domingo\*<sup>†</sup>

\*Departament de Sanitat i Anatomia Animal, Facultat de Veterinària, UAB and †CReSA, UAB-IRTA, Cerdanyola del Vallès, Spain

**Introduction:** Since the onset of the first cetacean morbillivirus (CeMV) epidemic (1990–1992), post-mortem studies have been performed on stranded cetaceans found on the Catalan Mediterranean Sea. Relevant lesions have been frequently found in the central nervous system (CNS), mostly associated with infectious agents.

**Materials and Methods:** Post-mortem studies were carried out on three different cetacean species (*Stenella coeruleoalba*, *Tursiops truncatus* and *Grampus griseus*), including gross and histopathological examination of the CNS, immunohistochemistry for CeMV and, in selected cases, microbiological studies.

**Results:** The main finding in the CNS was CeMV-associated non-suppurative encephalitis. Granulomatous to necrotizing encephalitis, due to active toxoplasmosis or aspergillosis was found in association with systemic CeMV infections. Primary encephalitis due to *Toxoplasma gondii* was also seen occasionally. Sporadic cases of suppurative encephalitis due to *Nocardia* spp. and *Porphyromonas asaccharolytica* also occurred. Recently, the first case of severe non-suppurative meningoencephalomyelitis due to *Brucella ceti* and the first description of pyogranulomatous and necrotizing meningoencephalomyelitis associated with *Cunninghamella bertholletiae* were recognized.

**Conclusions:** Post-mortem studies have been essential to reveal CNS infections as an important cause of cetacean stranding in the Catalan Mediterranean Sea. CeMV-associated encephalitis was the main finding to date.

**CENTRAL NERVOUS SYSTEM ZYGOMYCOSIS IN A BOTTLENOSE DOLPHIN (*TURSIOPS TRUNCATUS*) CAUSED BY *CUNNINGHAMELLA BERTHOLLETIAE***M. Isidoro\*, L. Pérez\*, X. Cabañes\*<sup>†</sup>, G. Castellà\*<sup>‡</sup>, M. Andrés\*<sup>§</sup> and M. Domingo\*<sup>†</sup>

\*Departament de Sanitat i Anatomia Animal, †Veterinary Mycology Group, Facultat de Veterinària, Universitat Autònoma de Barcelona, ‡Centre de Recerca en Sanitat Animal, UAB-IRTA, Cerdanyola del Vallès and §Centro-Fundación para la Conservación y Recuperación de Animales Marinos, El Prat del Llobregat, Spain

**Introduction:** Central nervous system (CNS) fungal infections are not unusual in bottlenose dolphins (*Tursiops truncatus*). Recently, the first case of pneumonia associated with *Cunninghamella bertholletiae*, a fungus belonging to the class Zygomycetes, has been reported in a captive killer whale (*Orcinus orca*). However, to date there are no descriptions of this fungus affecting the CNS of cetaceans.

**Materials and Methods:** A sub-adult, male bottlenose dolphin, found dead-stranded on the Catalan coast of the Mediterranean Sea, underwent a complete post-mortem investigation including gross examination, histopathology and microbiological isolation and characterization.

**Results:** At necropsy examination, multiple areas of malacia were observed grossly in the periventricular neuroparenchyma of the cerebrum. Microscopically, severe diffuse pyogranulomatous and necrotizing meningoencephalomyelitis and perineuritis were seen, associated with abundant intralesional fungal structures invading vessels, fibrinoid vasculitis and thrombosis. The hyphae were thin walled, pleomorphic, pauciseptate, frequently wrinkled and irregularly branched. *Cunninghamella bertholletiae* was identified by morphological characteristics and confirmed by molecular techniques.

**Conclusions:** To our knowledge this is the first reported case of CNS zygomycosis due to *Cunninghamella bertholletiae* in a cetacean.