Retrospective study on canine MUO

In association with

UCD researchers, including Monica Augusto, senior academic staff, a small animal intern and a final year veterinary medicine student have embarked on a study of canine meningoencephalomyelitis of unknown origin (MUO)

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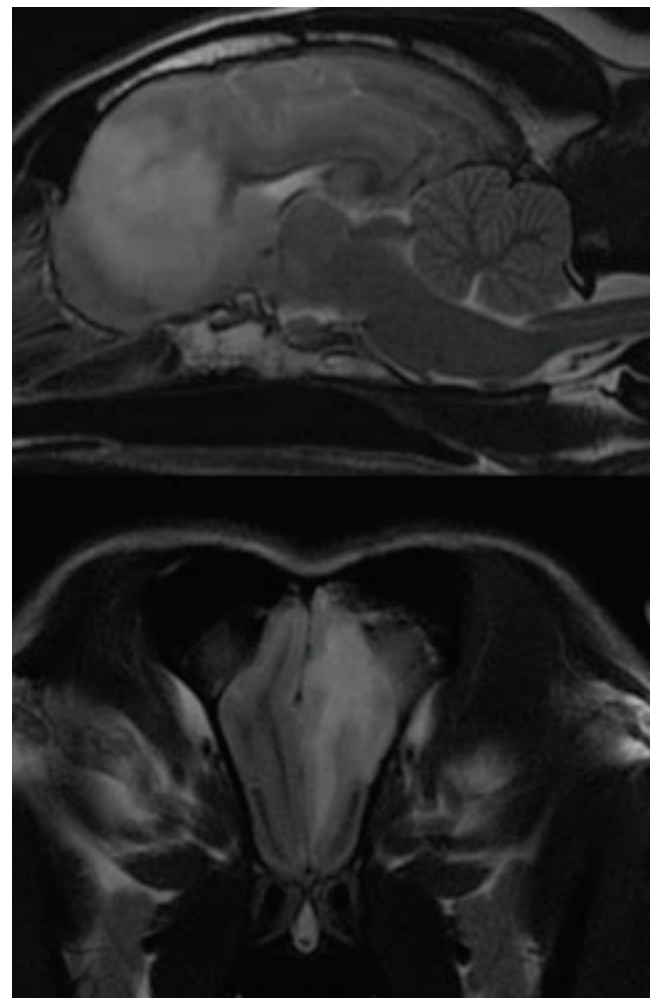
The team aims to investigate the typical clinical presentation, clinicopathological and imaging findings, potential risk factors and outcome of dogs diagnosed with MUO at the University College Dublin (UCD) Veterinary Hospital over the past ten years.

MENINGOENCEPHALOMYELITIS OF UNKNOWN ORIGIN (MUO)

Meningoencephalomyelitis of unknown origin (MUO) is a heterogeneous group of central nervous system (CNS) inflammatory diseases and likely the most common non-infectious meningoencephalitis diagnosed in dogs. It is a broad term that includes granulomatous meningoencephalomyelitis (GME), necrotising meningoencephalitis (NME), greyhound meningoencephalitis and necrotising leukoencephalitis (NLE)[3]. Clinical presentation varies from acute rapidly developing signs to slow progressive neurological decline over weeks to sometimes months, and prognosis is also variable, possibly dependent on the histopathological MUO subtype that is rarely confirmed ante-mortem[3]. There is established breed predisposition, especially in small and toy dogs, so a genetic cause has been suspected to contribute to the development of MUO. However, a genetic risk loci has only been identified in Pugs and Maltese dogs[8]. For most dogs an underlying aetiology is usually not identified, and, therefore, MUO is presumed to be a primary immune-mediated or idiopathic disease process, with also an unknown pathophysiology[5]. Neurological signs are often multifocal or diffuse, and may include altered mentation, proprioceptive or cranial nerve deficits, seizures, acute onset of blindness, spinal pain, and vestibular and cerebellar signs, as well as vague systemic signs like anorexia and, occasionally, pyrexia due to CNS inflammation[4].

The presumptive diagnosis of MUO depends on exclusion of other neurological conditions along with consistent findings on magnetic resonance imaging (MRI) of the brain and/or spine and cerebrospinal fluid (CSF) analysis. The diagnosis of MUO has increased in frequency over the past few decades, either because of a real increase in prevalence or due to increased awareness of the disease and the popularity of certain dog breeds[5].

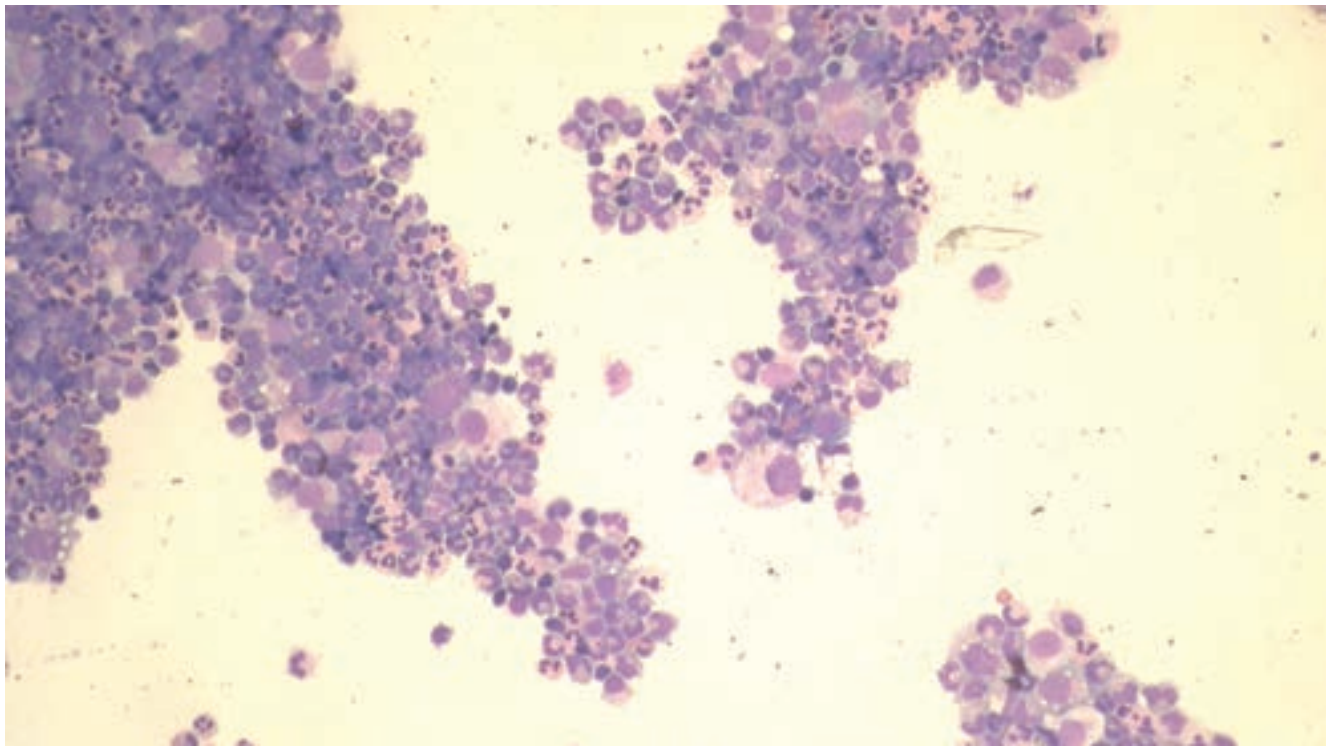
Dogs diagnosed with MUO are treated with immunosuppressive doses of glucocorticoids (often prednisolone) frequently in combination with other immunosuppressive medications such as cytosine arabinoside[4,6,7,9], mycophenolate[2,10], and cyclosporine[1,3]. Response to treatment is based on improvement or resolution of neurological signs, and occasionally repeated CSF analysis[3-4]. Glucocorticoids are the first line of therapy across all treatment recommendations, but the ideal protocol remains unclear in terms of drug choice, route (e.g., subcutaneous vs. intravenous infusion of cytosine) and even frequency of administration.



Sagittal (A) and transverse (B) T2W images of an eight-year-old female neutered Beagle diagnosed with MUO. Note the diffuse left olfactory and ventromedial aspect of the left frontal lobe hyperintensity affecting predominantly the white matter tracts on the T2W images. Image courtesy of Diagnostic Imaging Service at UCD Veterinary Hospital.

COMPARATIVE ASPECT TO HUMAN MEDICINE

Non-infectious (immune-mediated) meningoencephalomyelitis is common in humans and most



Cytology of a cytospin preparation of a cerebrospinal fluid sample (CSF) of a four-year-old female neutered Maltese dog diagnosed with MUO (200X amplification). Note the marked neutrophilic inflammation and occasional large mononuclear cells. Image courtesy of Dr Pedro Serra Dip.ACVP.

widely apparent in the high prevalence of multiple sclerosis (MS). The clinical presentation of primary progressive MS is similar to those of MUO in dogs[5]. Given the extensive research into the pathogenesis of MS, and new diagnostic and therapeutic strategies, significant advances in MUO might also be seen in the near future.

OBJECTIVES AND METHODOLOGY

This project is a large retrospective study looking at the epidemiology, clinical presentation, diagnostic imaging findings and clinicopathological results of dogs diagnosed with MUO in view of identifying possible risk factors, patterns of immune response, and treatment drug combinations that may ultimately dictate the outcome of dogs diagnosed with MUO.

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