



What's happening in the Netherlands in the field of Neurology

Paul Mandigers
DVM, PhD, DipECVN-ECVIM

Utrecht University, The Netherlands

P.J.J.Mandigers@uu.nl

For centuries neurology has been, depending on the university, either a small part of surgery or internal medicine. With epilepsy and spinal cases being the majority of cases for referral it was a logical thing to do. For the epilepsy case there was only a limited amount of available treatments and the spinal case, if the prognosis was judged to be fair, simply went for surgery.

However, with the development of the smartphone, high-tech CT scanners and the introduction of (high field) MRI scanners this has completely changed. If something happens to their pet owners nowadays make a small film to show it to us. And what earlier might have been called epilepsy can now suddenly be classified as a movement disorder with completely different diagnostics and treatment regimes. Diagnosis are no longer mere hypothesis. They can be fairly properly diagnosed with CT, MRI and intracranial biopsies. It is safe to say that at most referral clinics and universities, neurology has become one of the larger sections with several staff members, interns and residents. And it is still growing!

Each clinic/university has its own flagships. And logically this is the same in the Netherlands. Since the broadcast of the BBC documentary 'Pedigree Dogs Exposed' (2008) the welfare of (pedigree) dogs has been a clear item on the Dutch political and veterinary agenda. In this BBC documentary special emphasis had been placed on the CKCS with chiari malformation (CM) and syringomyelia (SM) as two devastating disorders harassing the breed. Instead of looking away from this (which has been done by breeders in many other EU countries) the Dutch breeders started to scan all their stud dogs with remarkable results. Based on breeding results and analysis of 1200 MRI scans we concluded that selection, based on phenotypes is possible (1, 2). However, it is not simple genetics (3). A recent analysis of over 1800 available MRI scans and looking at the ancestors of the currently born CKCS population we concluded that it should be possible to get away from these disorders (2). CM/SM is not just a disorder of the CKCS but is seen in many other toy-breeds (4) with the Chihuahua and Pomeranian also affected but differently compared to the CKCS (not yet published - to be discussed).

One of our other flagships is the genetics of all these breed related disorders. A number of mutations have been identified in different breeds responsible for a wide variety of neurological disorders. No longer should we be facing leukoencephalopathy in the Leonberger or Rottweiler (5). The same applies for Hereditary Necrotizing Myelopathy in 'Het Nederlandse Kooikerhondje' (not yet published), a novel type of epilepsy in the Boerboel, a movement disorder in the 'Stabij' (not yet published). But we address many other neurological disorders such as polymyositis in "Het Nederlandse Kooikerhondje" (to be discussed).

Within our group we are also addressing epilepsy (a.o. in the Border collie - to be discussed on Friday) and movement disorders on a diagnostic level, treatment wise and genetically (to be discussed on Friday).

Literatuur

1. Wijnrocx K, Van Bruggen LWL, Eggelmeijer W, Noorman E, Jacques A, Buys N, et al. Twelve years of chiari-like malformation and syringomyelia scanning in Cavalier King Charles Spaniels in the Netherlands: Towards a more precise phenotype. *PloS one*. 2017;12(9):e0184893.
2. Mandigers PJJ, editor CM/SM in the CKCS - can we get away from it? CKCS club Denmark; 2018 October 2018; Denmark.
3. Ancot F, Lemay P, Knowler SP, Kennedy K, Griffiths S, Cherubini GB, et al. A genome-wide association study identifies candidate loci associated to syringomyelia secondary to Chiari-like malformation in Cavalier King Charles Spaniels. *BMC genetics*. 2018;19(1):16.
4. Limburg PG, Mandigers PJJ. The prevalence of Chiari-like malformation and Syringomyelia in Several Toy Breeds in the Netherlands. *Voorjaarsdagen; Amsterdam: NACAM; 2014.*
5. Minor KM, Letko A, Becker D, Drogemuller M, Mandigers PJJ, Bellekom SR, et al. Canine NAPEPLD-associated models of human myelin disorders. *Sci Rep*. 2018;8(1):5818.