Monitoring of centrally regulated endocrine diseases in dogs and cats – assessment of medical control, impact of the disease on the affected individual and long-term prognosis

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Summary
Disorders of the of the thyroid and adrenal gland are frequently encompassed endocrine diseases in small animal medicine. Cats are commonly affected by hyperthyroidism, and dogs suffer from hypothyroidism, hyperadrenocorticism and hypoadrenocorticism. Pituitary dwarfism is a rare congenital disease in German shepherd dogs. Whereas means of diagnosis of those diseases are well established and straight forward, little is known on the long-term prognosis if medical treatment strategies are pursued. Depending on the underlying endocrine disease, laboratory parameters to assess clinical control are poorly established. Studies evaluating the importance of clinical parameters and wellbeing are lacking.

Research Objectives
There are several aims of this research topic. First, more information on the importance of certain diseases should be gathered by assessing prevalence of feline hyperthyroidism, canine lymphocytic thyroiditis, hypothyroidism and hypoadrenocorticism in Germany and if possible, risk factors should be analysed. As little is known on how valid some T4 assays are (bedside tests vs. enzyme immunoassays) and if clinical symptoms such as the palpation of the thyroid gland helps to establish a diagnosis, a second study aim was to evaluate two commonly used T4 assays and to assess the importance of thyroid gland palpation in hyperthyroid cats. To diagnose and monitor thyroid diseases in dogs and cats, measurement of T4 plays a central role. Thirdly, as the impact on medical treatment on wellbeing, clinical signs and/or laboratory parameters and long-term prognosis in dogs with hyperadrenocorticism and German shepherd dogs with pituitary dwarfism are poorly characterized, monitoring tests should be evaluated in dogs with hyperadrenocorticism treated with trilostane as well as the evolution of their clinical signs. It should be analyzed if those dogs should be vaccinated according to established guidelines. In German shepherd dogs affected by pituitary dwarfism, knowledge on how different treatment modalities impact wellbeing and survival time is missing.

Key Findings
A prevalence of 12.3% for feline hyperthyroidism was found in southern Germany in cats older than 8 years. Older female cats were significantly more often affected. Domestic shorthair and domestic longhair cats were more likely hyperthyroid than purebred cats. Questionnaire analysis

identified that hyperthyroid cats were more likely to be fed with moist cat food from aluminium tins compared to non-hyperthyroid cats.
Amongst dogs with chronic gastrointestinal signs, 4% suffered from hypoadrenocorticism. Those dogs had normal electrolytes and more commonly signs of gastrointestinal blood loss compared to dogs without hypoadrenocorticism. Analysis of canine lymphocytic thyroiditis and hypothyroidism is currently ongoing.
The Eurasian dog breed is predisposed to hypothyroidism (6.8%) and lymphocytic thyroiditis (13,3%) compared to other dogs. The disease is hereditary in this breed. Autoantibodies against thyroglobulin is a valuable screening marker for lymphocytic thyroiditis.
Almost 80% of hyperthyroid cats and up to 20% of healthy cats and cats with non-thyroidal illness had a palpable thyroid gland. Median thyroid palpation score in hyperthyroid cats was significantly higher compared to the other groups. Hyperthyroid cats with larger thyroid glands did not have higher T4 levels. Hyperthyroid cats with lower clinical scores had significantly higher T4 levels compared to hyperthyroid cats with higher scores.
T4 was measured in sera of dogs and cats by an enzyme immunoassay (EIA) and an enzyme fluorescence assay (ELFA). The EIA was performed with an automated analyser. The ELFA was performed with an in-house automated analyser. Intra- and inter-assay coefficients of variation of the ELFA and EIA in the dogs' sera were < 10%. In cats it was 15% for the EIA and < 10% for the ELFA. The ELFA is a fast method with a high precision.
Research on canine hyperadrenocorticism revealed that the commonly used ACTH stimulation test does not correlated with clinical symptoms of the disease in dogs treated with trilostane such as polyuria, polydipsia, polyphagia and panting and therefore does not reflect control of the disease.
Dogs with pituitary dwarfism treated with levothyroxine or levothyroxine and growth hormone or progesterone live significantly longer than untreated dogs. The latter treatment induces body growth and seems to prevent occurrence of chronic kidney disease.

Selected Publications

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