

# Small animal Review

Knowing the risk factors for disease can help understand pathogenesis, which can potentially inform the development of treatments. Further, knowledge of risk factors can help in prevention of diseases. Three recent articles look at the risk factors for the development of different neoplasms in dogs and cats. <https://doi.org/10.12968/coan.2022.0032>

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Information on the risk factors for oral squamous cell carcinoma in cats is mainly taken from a single 20-year old study. To provide more up to date information, Zaccone et al (2022) undertook a prospective, observational case-control study of 70 cats with chronic gingivostomatitis, 63 cats with periodontal disease and 500 controls, to examine the risk factors for development of oral squamous cell carcinoma. Owners of the cats completed a questionnaire about demographics, environment and lifestyle.

The authors found that a rural environment, outdoor access, feeding pet food containing chemical additives and environmental tobacco smoke were significantly associated with an increased risk of developing oral squamous cell carcinoma, with odds ratios of 1.68 to 1.98. Oral inflammation was reported in 35% of cats with oral squamous cell carcinoma but was not found to be a risk factor for its development.

Canine massive hepatocellular carcinomas are rare tumours derived from hepatocytes. They are defined as massive if they are large and affect a single liver lobe. These tumours are often treated surgically, but it can be difficult to achieve complete resection. However, there is little information about recurrence rates and risk factors for recurrence after complete or incomplete resection.

Lapsley et al (2022) performed a case-control study with the aim of evaluating the time to recurrence, risk factors for recurrence and outcome in dogs with massive hepatocellular carcinoma. The study included 75 dogs with

massive hepatocellular carcinoma who had the tumours recur and 113 dogs with massive hepatocellular carcinoma in which the tumours did not recur.

No risk factors were identified that were associated with recurrence. The median time to recurrence was 367 days with a range of 32 to 2096 days, but the median overall survival time was similar in dogs with and without recurrence. Treatment of recurrence showed a trend towards increasing survival time, but this was not significantly different from dogs that did not undergo further treatment after recurrence. Similarly there was no significant difference in survival times for dogs with complete and incomplete excision. Levels of liver enzymes were elevated in dogs with recurrent disease, so this test could be used as a marker for recurrence.

The authors recommend post-treatment surveillance for at least 1 year, especially in dogs where further intervention is possible. They note that dogs with massive hepatocellular carcinoma have a favourable long-term prognosis regardless of local recurrence, complete vs incomplete excision or even the presence of pulmonary metastasis.

Oral mucosal melanomas are derived from the mucosal melanocytes, and account for around 1% of all canine neoplasms. Males, older dogs and dogs with black coats are predisposed to developing oral mucosal melanoma. Unfortunately this cancer is highly aggressive in dogs. However, little is currently known about its risk factors and aetiology. de Carvalho et al (2022) performed a case-control study with the aim of identifying risk

factors for the development of oral mucosal melanoma, and in particular to see whether papillomaviruses are a possible aetiological factor.

In this study, 15 dogs with oral mucosal melanoma were paired with 15 control dogs, and the owners of these dogs filled in an epidemiological questionnaire. Oral swabs were taken from the dogs and underwent RNA sequencing to analyse the oral microbiome. Oral mucosal melanoma samples also had DNA extracted and analysed by polymerase chain reaction to attempt to identify canine papillomaviruses.

A total of 47% of cases of oral mucosal melanoma were located on the gingiva. Most tumours were stage III by the time of diagnosis. Most of the dogs with oral mucosal melanoma had grade 3 periodontal disease, but this was not statistically different from control dogs, nor did tooth brushing or treatment of tartar differ between cases and controls. Most dogs in both groups had contact with smokers, and there was no difference between the groups in this regard.

Canine papillomaviruses were not detected in the cases with oral mucosal melanoma, but levels of *Tannerella forsythia* and *Porphyromonas gingivalis* bacteria were significantly increased in case dogs compared to the controls. These bacteria are thought to be associated with the development of periodontal disease and oesophageal cancer in humans, so the authors suggest they may play a role in the development of canine oral mucosal melanoma. The authors recommend that further studies with larger number of cases are performed to confirm these findings. **CA**

## References

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