Immunoexpression of Cox-2, C-kit and EGFR in dog and cat lung tumours

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Introduction

Lung tumours are a very type of neoplastic aggressive disease with scarce therapeutic options both in dog and cats.
This study aimed to evaluate the imunoexpression of Cox-2, C-kit, EGFR in order to evaluate their potential as therapeutic targets in those neoplasia in both species.

Material and Methods

Tumor samples

Eighteen lung carcinomas from 13 dogs and 5 cats were included and analyzed by immunohistochemistry. The tumors were classified according to the World Health Organization (WHO) criteria. The tumors were from distinct histological types:
(11 Papillary Adenocarcinomas;
5 Bronchioloalveolar carcinomas and 2 Acinar Adenocarcinomas).

Immunohistochemistry

For immunohistochemistry, cases were submitted to cross-reaction with antibodies against Cox-2; C-kit and EGFR as follows: Cox-2 (Antibody Anti-Cox-2, Clone SP21 and dilution 1:40, Termo Scientific®); C-kit (Polyclonal Rabbit Anti-Human CD117 Dako®, dilution 1:100) and EGFR (Antibody Anti-EGFR, 1:100, Invitrogen®).

Immunoexpression was carried out by the streptavidin-biotin-peroxidase complex method, with a commercial detection system (Ultra Vision Detection System; Lab Vision Corporation, Fremont, USA) following the manufacturer's instructions.

Results

The medium age for dogs was 11.69±3.06 years (min-8, max-18) and for cats 12.8±2.38 years (min-10, max-16).
Cox-2 overexpression (Fig. 1 and 2) was detected in 88.8% of the cases (16 out of 18 cases), being statistically associated with high mitotic index (p=0.024).
C-kit expression (Fig.3 and 4) was detected in 83.3% (15 out of 18) and was statistically associated with histological type (p=0.026) and nuclear pleomorphism (p=0.013).
Overexpression of EGFR (Fig.5) was detected in 94.4% (17 out of 18) of the samples, showing a statistically significant association with high nuclear atypia (p=0.039) and mitotic index (p=0.045).

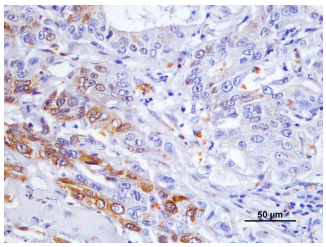

Fig. 1:Cox-2 expression in a feline acinar adenocarcinoma

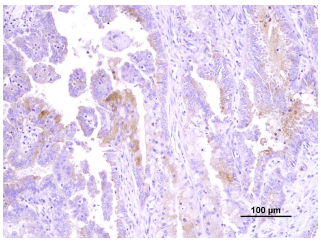

Fig. 2: Cox-2 expression in a dog lung adenocarcinoma

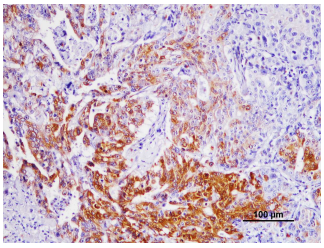

Fig. 3: C-kit immunoexpression in a cat lung papillary adenocarcinoma

Results

Table 1: Relationship of Cox-2; C-kit and EGFR with clinicopathological parameters. Satistical significance values (*p*). NS – not significant

Clinical and Pathological parameters	Cox-2	C-kit	EGFR
Tumor histological type	N.S	*0.026*	N.S
Nuclear pleomorphism	N.S	*0.013*	*0.039*
Differentiation	N.S	N.S	N.S
Mitotic index	*0.024*	N.S	*0.045*
Necrosis	N.S	N.S	N.S

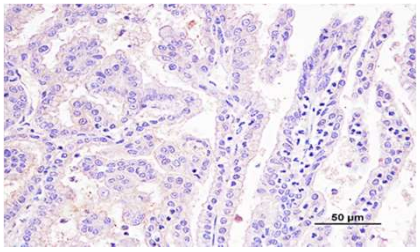

Fig. 4: C-kit immunoexpression in a dog lung papillary adenocarcinoma

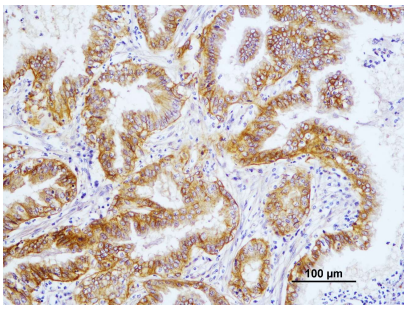

Fig. 5: EGFR immunoexpression in a dog lung papillary adenocarcinoma

Conclusion

Results from the present study showed an overall high immunoexpression of the three biomarkers in lung tumours of dog and cats, independently of the histological type and therefore revealing its promising role as therapeutic targets in those species.