

## PREVENTIVE ECOSANITIZING OF THE BIOTOPE AND COMPARATIVE DIAGNOSIS OF MALIGNANT NHL LYMPHOPROLIFERATION IN HUMANS, DOGS AND CATS STANDARDIZATION

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### Abstract

*Lymphomas are malignant monoclonal cell proliferation having the starting point in the organized lymphoid tissue (spleen, thymus, limfocentrii) or the diffused lymphoid tissue (gut-Payer boards and tonsils)*

*The different types of lymphomas are common regarding the symptoms, but differs depending on changes that occur at the cellular level and proliferating cell type, proliferation type and how they echo through out the body.*

*Age and sex of the animals have an important role because this form of cancer is identified by the age of 2 (years) with maximum frequency between 5 and 7 years old, but also with cases at age 10 in both sexes. Breeds that are most often affected are: Boxer, Scottish Terrier, Airedale Terrier, German Shepherd, Poodle, Rottweiler and Golden Retriever. Purebred dogs are more sensitive than half breeds. The color black appears to be a factor due to absorption of ultraviolet radiation, dogs with dark fur being exposed to both skin tumors and NHL.*

*Lymphoma diagnosis begins with clinical examination revealing enlarged lymph nodes and sometimes the presence of general signs of illness: fever, cluster, weight loss, dyspnea, anorexia, anemia. Lymphosarcoma classification is based on location, histological criteria and immunophenotypic features.*

**Key Words:** *ecosanitizing, markers, diagnosis, NHL.*

### INTRODUCTION

The emergence of new modern techniques and immunohistochemical phenotyping diagnostic in human medicine has helped proliferating cells of malignant lymphoma be well characterized, this contributes to the exact classification of the type of lymphoma and thereby an assessment of prognosis, closely related to the therapeutic means, taking also into account other factors such as the patient's age, associated diseases and paraneoplastic syndromes.

The frequency of these types of tumors in domestic animals is extremely high, being the most common hematopoietic neoplasm in dogs. Lymphomas are divided into two main groups: B-cell lymphomas and T cell lymphomas, according to the proliferating lymphoid cells - B or T predominant B-cell lymphomas, representing 75-80% of all lymphomas.

NHL is common in humans and pets that share the same biotope (air, water, food) and

the same environmental oncofactors (natural and artificial ionizing radiation, carcinogenic chemicals - E's, aromatic hydrocarbons, chlorine, gluten, nitrates and nitrite), but mostly the well known oncogenic viruses HTLV 1 and 2 in humans and FeLV, FeSV, FIV in cats.

NHL incidence in humans is constantly growing, being more common in adults and the elderly, and representing the sixth place of cancers in men (after prostate cancer, lung, colon and rectum, bladder and melanoma) and the fifth place in women (after breast, lung, colon, rectum and uterus).

The term malignant lymphoma (NHL) in dogs is used to refer to the equivalent of NHL in humans. Due to the similarities of clinical course and therapeutic response, lymphoma in dogs is a useful model for studies with results that can be adapted to human NHL therapy. It ranks first due to the increased frequency of hematopoietic tumors in this species and the third place of all canine tumors.

Lymphoma in cats is rapidly evolving, faster than NHL in dogs, with predominantly extra

lymph node localizations, anterior mediastinum is the most common starting point when considering respiratory infections, intestinal localization is due to ingestion of the Feline Sarcoma Virus, but peripheral lymph node hyperplasia (micropoliadenopatia) rarely occurs.

## MATERIALS AND METHOD

Clinical staging and the diagnosis requires a number of clinical investigations, regardless of species, especially if the human cohabitates in the same biotope with a domestic carnivore (dog or cat) suspected of having malignant lymphoma.

We have tracked, diagnosed and then treated specifically: 5 human patients (3 men and 2 women), 5 dogs (3 males and 2 females), 5 cats (3 females and 2 males) of different ages and races suspected to have malignant lymphoma, in various stages of clinical development.

Both human and veterinarian oncologists have examined all the patients, the results being written down in oncological medical charts, where we underlined if there were cases in which both the person and the animal suspected of cancer have been living together and have developed simultaneously the disease.

Complementary examinations helped staging and assessing the extent of the cancer in the body in both humans and animals using: chest radiography, computed tomography (chest and abdomen), abdominal ultrasound, exploratory laparotomy (the most reliable method for the diagnosis of intraductal acute disease), marrow biopsy, CBC, ESR, blood chemistry tests (to evaluate the function of liver and kidney, blood tumor markers, alkaline phosphatase, lactate dehydrogenase). Cytopathology exam (limfadenograma by puncture aspiration) pursued setting the type of lymphoma through the image and topography of the lymphoid malignant cell in the lymph nodes, and later confirmed by immunohistochemistry, the serological examination being mandatory for leukemia with suspected viral etiology.

## RESULTS AND DISCUSSIONS

NHL clinical symptoms in both humans and domestic carnivores is polymorphic and uncharacteristic, as there are no pathognomonic signs apart from macropoliadenopathy, animal patients show anorexia, cachexia, vomiting and diarrhea. The malignant proliferation determines initially a solitary enlarged lymph node, in only one lymph node group, retropharyngeal or prescapular often with progressive enlargement accompanied by visceral lesions and bone marrow invasion expressed through late neoplastic peripheral lymphoblastic citemia. Frequent enlarging of the lymph nodes may appear: superficial or deep, single or multiple, related or not to lymphocytic infiltrations to neighboring organs, especially in the spleen and liver.

The clinical evolution has two forms:

External adenopathy, which usually is localized mostly bilateral submandibular and/or laterocervical. But prescapular lymph nodes may be affected. Inspection reveals animals usually develop an impressionable asymptomatic lymph nodes hypertrophy or lymphadenopathy associated with fever, night sweats, weight loss, pruritus. In humans manifestation of onset may be superior vena cava obstruction or spinal cord compression, cervical and/or supraclavicular lymphadenopathy appears in more than 70% of cases; Generalized lymphadenopathy is atypical. On palpation hypertrophied lymph nodes are irregular, painless, hard consistency.

Internal adenopathy is usually mediastinal, but can be mesenteric, myelogenous, bone or other. Mediastinal adenopathy causes mediastinal syndrome; it is common in the form of nodular sclerosis in Hodgkin's disease. It can cause coughing, blocking of the cranial vena cava, which is the most common symptom in non-Hodgkin lymphoma. Pleurisy can occur either by compression over vascular and/or lymphatic vessels or by direct invasion of the pleura. In the abdomen the spleen, the splenic and celiac lymph nodes are the first invaded. The clinical course of the spleen is misleading. Liver invasion is always associated with spleen invasion. In the final stages of the disease the bone marrow (lymphocytic

depletion and cause mixed cellularity), bone structure (jet osteoblastica), cutis, central nervous system, meninges, Waldeyer ring and kidneys can be affected. We should not omit the sign of invasion and / or compression of various structures and the occurrence of pain.

**SYSMEX\_XT1800H**

Test	Rezultat	Val. norm./unit. ma
WBC	4.85	4.0 - 9.0 / *10 <sup>9</sup> /µL
RBC	4.51	4.70 - 6.10 / *10 <sup>6</sup> /µL
HGB	13.9	14.0 - 18.0 / g/dl
HCT	39.8	42.0 - 52.0 / %
MCV	88.2	80.0 - 94.0 / fL
MCH	30.8	27.0 - 31.0 / pg
MCHC	34.9	32.0 - 36.0 / g/dl
PLT	147	150 - 400 / *10 <sup>9</sup> /µL
LYMPH%	27.8	20.5 - 45.5 / %
MONO%	10.1	5.5 - 11.7 / %
NEUT%	57.2	43.0 - 65.0 / %
EO%	4.5	0.9 - 2.9 / %
BASO%	0.4	0.2 - 1.0 / %
LYMPH#	1.35	1.30 - 2.90 / *10 <sup>9</sup> /µL
MONO#	0.49	0.30 - 0.80 / *10 <sup>9</sup> /µL
NEUT#	2.77	2.20 - 4.80 / *10 <sup>9</sup> /µL
EO#	0.22	0.00 - 0.20 / *10 <sup>9</sup> /µL
BASO#	0.02	0.00 - 0.10 / *10 <sup>9</sup> /µL
RDW-CV%	12.2	11.9 - 14.5 / %
RDW-SD	38.3	39.0 - 52.3 / fl
PDW	11.6	0.0 - 99.9 / fl
MPV	10.5	7.4 - 10.4 / fL
P-LCR%	28.5	19.2 - 47.0 / %
PCT	0.15	0.00 - 0.99 / %

Validat de: As. Pr. Mioara Ivanescu

### Citologie

Examen frotiu sange

Grupe mici de trombocite.

Figure 1 Blood analysis for a human patient with a splein lymphoma suspicion (Hematology lab Coltea Hospital)

**EXAMEN HEMATOLOGIC**

Parametru	UM	Rezultat	Val de referinta
Leucocite	mii/µl	68.3	5.5-19.5
Linfocite	mii/µl	42.3	0.8-7
Monocite	mii/µl	4.3	0.1-1.9
Granulocite	mii/µl	27.7	2.1-15.0
Linfocite	%	61.5	12-45
Monocite	%	6.3	2-9
Granulocite	%	31.8	35-85
Eritrocite	milioane/µl	9.25	4.6-10
Hemoglobina	g/dl	16.2	9.3-15.3
Hematocrit	%	48.2	28-49
HEM	fl.	50	39-52
HEM	pg	16.1	13-21
CHEM	g/dl	32.2	30-38
Largimea benzii eritrocitare	%	16.2	14-18
Trombocite	mii/µl	156	100-514
VPM	fL	106	5.0-9.0
Largimea benzii trombocitare	%	16.6	-
Plachetocrit	%	13.46	-
Neutrofile segmentate	%	3	1-4
Neutrofile nesegmentate	%	28	45-65
Neutrofile multisegmentate	%	0	0-1
Eozinofile	%	1	1-5

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Figure 2 Blood analysis for a feline patient with a malignant lymphoma suspicion (Lad Vet Cor - Dr.Cornalia)

## CONCLUSIONS

Sistemele majore de clasificare morfologica a limfomului malign uman ce au fost extrapolate limfomului malign la caine sunt: clasificarea Kiel, Rappaport, NCI Working Formulation, Lukes-Collins. Dintre acestea NCI Working Formulation s-a dovedit a fi cea mai folositoare, o punte intre diferitele clasificari.

Recomandarea rezultata din studiile noastre clinice este de a acorda deosebita importanta limfonodulilor care afectati de proliferarea tumorală devin mariti in volum (uneori de 3-10 ori) duri, nedurerosi, aderenti la piele si la planurile profunde.

Simptomele cu un grad ridicat de suspiciune sunt adenopatia pronuntata unilaterala sau micropoliadenopatia externa.

Cainii cu limfom malign pot fi considerati santinele pentru potentiale situatii dezastruoase pentru om, datorita unei relativ scurte latente intre expunere si izbucnirea bolii.

S-au observat odata cu aparitia semnelor clinice de polidipsie si poliurie o scadere a ratei filtrarii glomerulare rezultand cresterea ureei sangvine si concentratiilor creatininei (in 87% din LNH-canin si respectiv 64% din cazurile de LNH-uman), anorexie (88%).

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