HAEMATOLOGICAL MODIFICATIONS IN SOME MALIGNANT TUMOURS OF COMPANION ANIMALS

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Summary

We performed the haematological examination on 30 companion animals (dogs) that have been precise diagnosed with various histopatological types of malignant tumour in Faculty of Veterinary Medicine, Bucharest. Next we reviewed and construed the haematological results in three situations of cancer: sarcoma, acytemic lymphoma (without toumoral cells in peripheral blood) and carcinoma.

Key words: haematological examination, sarcoma, acytemic lymphoma, carcinoma

Veterinary literature has poor data regarding haematological modifications in cancerous disease. Correlative studies between cancer evolution and haematological modifications have been effectuated in human specie (not in animals), but not on particular types of neoplasm.

Materials and methods

The study was made on 30 dogs diagnosed with some oncopaties that we divided in three groups: ten sarcoma, ten acytemic lymphoma and ten carcinoma. To these dogs we have done hematological exams, both quantitative and qualitative by reading the hematological values to MS4 machine and the hemogram (blood formula) from the buffy coat panoptic colored put under microscope. Dogs were evaluated in different stages of cancer development and weren't treated with cytostatic substances.

Results and discussions

Tab.1.

Hematological examination in the investigated dogs with sarcoma, acytemic lymphoma and carcinoma

It.	Diagnosis	WBC m/mm^3	Percentage of leukocytes (%)							Absolute leukocytes count (leukocyte m/mm^{3}blood)							RBC M/mm^3	Hb g/dl	THR m/mm^3
			N	L	M	E	B	NK	D	N	L	M	E	B	NK	D			
1	Mesenteric fibrosarcoma	3.54	78	6	12	4	-	-	-	2.76	0.21	0.43	0.14	-	-	-	5.41	9.30	164
2	Spleen fibrosarcoma	48.88	90	5	5	-	-	-	-	44.00	2.44	2.44	-	-	-	-	5.68	9.45	222
3	Subcutaneous fibrosarcoma	16.12	80	5	10	5	-	-	-	12.90	0.81	1.60	0.81	-	-	-	5.12	10.7	278
4	Subcutaneous fibrosarcoma	12.90	78	10	7	5	-	-	-	10.06	1.29	0.90	0.65	-	-	-	5.80	12.0	189
5	Osteoblastic Osteosarcoma	17.36	85	5	7	3	-	-		14.76	0.87	1.21	0.52	-	-	-	5.00	11.1	190
6	Synovioma	5.25	65	26	5	4	-	-	-	3.41	1.37	0.26	0.21	-	-	-	8.09	16.9	294
7	Rabdomio-sarcoma	5.15	83	6	7	4	-	-	-	4.27	0.31	0.36	0.21	-	-	-	4.20	9.00	81
8	Sticker's sarcoma	10.45	84	4	10	2	-	-	-	8.78	0.42	1.04	0.21	-	-	-	5.70	10.1	309
9	Osteogenic osteosarcoma	8.62	70	18	6	6	-	-	-	6.03	1.55	0.52	0.52	-	-	-	3.12	5.46	184
10	Mastocytoma	11.22	76	15	5	4	-	-	-	8.53	1.68	0.56	0.45	-	-	-	5.05	11.5	431
11	Immunoblastoma	7.02	71	9	5	-	-	15	-	4.99	0.63	0.35	-	-	1.05	-	4.22	7.47	160
12	Hodgkin's lymphoma	3.80	71	19	5	5	-	-	-	2.70	0.72	0.19	0.19	-	-	-	3.07 (normo-blasts)	6.00	404
13	Immunoblastoma	6.17	81	9	7	3	-	-	-	5.00	0.56	0.43	0.18	-	-	-	5.22	8.70	149
14	Histiocytic lymphoma	30.45	76	13	5	6	-	-	-	23.14	3.96	1.52	1.83	-	-	-	8.35	14.6	503
15	Histiocytic lymphoma	4.55	71	14	11	4	-	-	-	3.23	0.64	0.50	0.18	-	-	-	5.60	10.0	858
16	Centrocytic B cell lymphoma	3.00	75	8	10	7	-	-	-	2.25	0.24	0.30	0.21	-	-	-	5.91	8.00	609
17	Histiocytic lymphoma	24.64	81	14	5	-	-	-	-	19.96	3.45	1.23	-	-	-	-	5.06	8.20	398

18	B cell lymphoma	14.74	84	10	6	-	-	-	12.38	1.47	0.89	-	-	-	-	3.70	7.47		56
19	Plasmocytoma	12.36	62	28	6	4	-	-	7.66	3.46	0.74	0.50	-	-	-	5.82	9.50		454
20	Centrocytic B cell lymphoma	27.80	75	14	3	8	-	-	20.85	3.90	0.83	2.22	-	-	-	7.19	17.0		89
21	Mammary compact adenocarcinoma	2.00	Pancytopenia*													3.70	7.74		135
22	Mixed mammary adenocarcinoma	1.50	Pancytopenia*													3.80	7.10		83
23	Hepatocellular carcinoma	7.96	90	3	7	-	-	-	7.16	0.24	0.56	-	-	-	-	5.20	11.0		166
24	Nasal carcinoma	25.11	76	14	8	2	-	-	19.08	3.52	2.01	0.50	-	-	-	6.89	13.5		551
25	Nasal adenocarcinoma	21.36	70	20	3	7	-	-	14.95	4.27	0.64	1.50	-	-	-	7.20	15.7		541
26	Carcinoma	16.31	62	29	9	-	-	-	10.11	4.73	1.47	-	-	-	-	5.80	9.0		661
27	Bladder adenocarcinoma	17.68	73	17	3	7	-	-	12.91	3.00	0.53	1.24	-	-	-	5.80	11.3		328
28	Bladder adenocarcinoma	3.14	71	10	9	10	-	-	2.23	0.32	0.28	0.31	-	-	-	7.37	17.9		594
29	Bladder adenocarcinoma	13.75	67	17	8	8	-	-	9.21	2.34	1.10	1.10	-	-	-	5.89	10.1		749
30	Nasal carcinoma	14.36	73	18	4	5	-	-	10.48	2.58	0.58	0.72	-	-	-	7.65	16.3		460

*Due to pancytopenia white blood cells can't be count and the leukocytary formula can't be done

According to Table 1 the hematological results can be classified as fallow:

- The 10th dogs with sarcoma shows:
  - leukopenia (1.5-5 WBC m/ml^3) - 1 case;
  - normal leukocyte number (5-17 WBC m/ml^3) - 8 cases;
  - leukocytosis – (17-50 WBC) m/ml^3- 1 case.
- The 10th dogs with acytemic lymphoma shows:
  - leukopenia - 3 cases;
  - normal leukocyte number - 4 cases;
  - leukocytosis - 3 case.
- The 10th dogs with carcinoma shows:
  - leukopenia - 3 cases;
  - normal leukocyte number - 4 cases;
  - leukocytosis - 3 case.

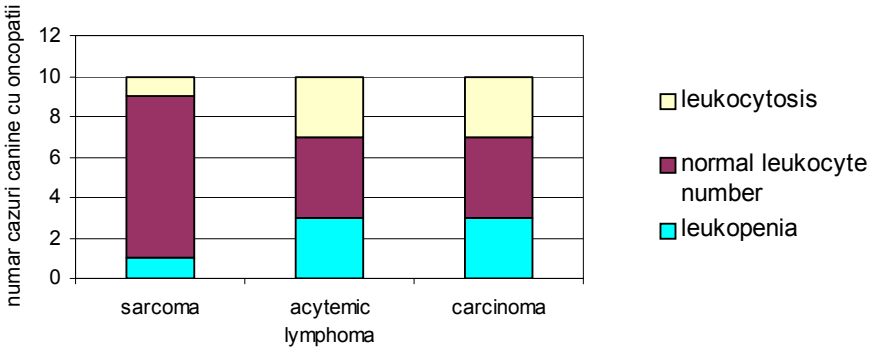

Chart 1. WBC values in 30th investigated dogs with malignant tumors

- The 10th dogs with sarcoma shows:
  - anemia - 1 case;
  - slight anemia – 6 cases;
  - normal red blood cells values - 2 cases.
- The 10th dogs with acytemic lymphoma shows:
  - severe anemia - 1 case;
  - anemia - 5 cases;
  - slight anemia – 2 cases;
  - normal red blood cells values - 2 cases.
- The 10th dogs with carcinoma shows:
  - severe anemia - 2 case;
  - anemia - 1 case;
  - slight anemia – 4 cases;
  - normal red blood cells values - 3 cases.

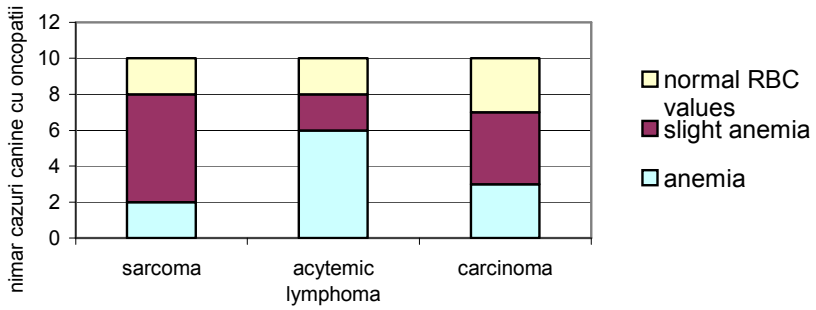

Chart 2. RBC values in 30th investigated dogs with malignant tumors

- The 10th dogs with sarcoma shows:
  - thrombocytopenia - 5 case;
  - normal trombocyte number - 5 cases.
- The 10th dogs with acytemic lymphoma shows:
  - leukopenia - 4 cases;
  - normal leukocyte number - 6 cases;
- The 10th dogs with carcinoma shows:
  - thrombocytopenia - 3 case;
  - normal trombocyte number - 5 cases;
  - trombocytosis - 2 case.

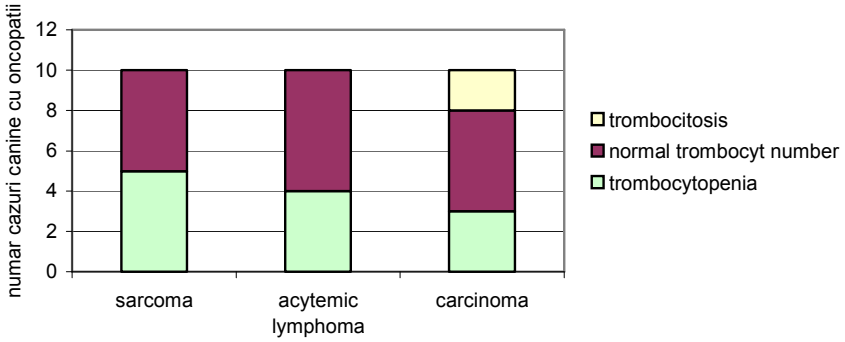

Chart 3. THR values in 30th investigated dogs with malignant tumors
Now we will particularize the values obtained for every white cellular line:

- *Neutrophil granulocytes*

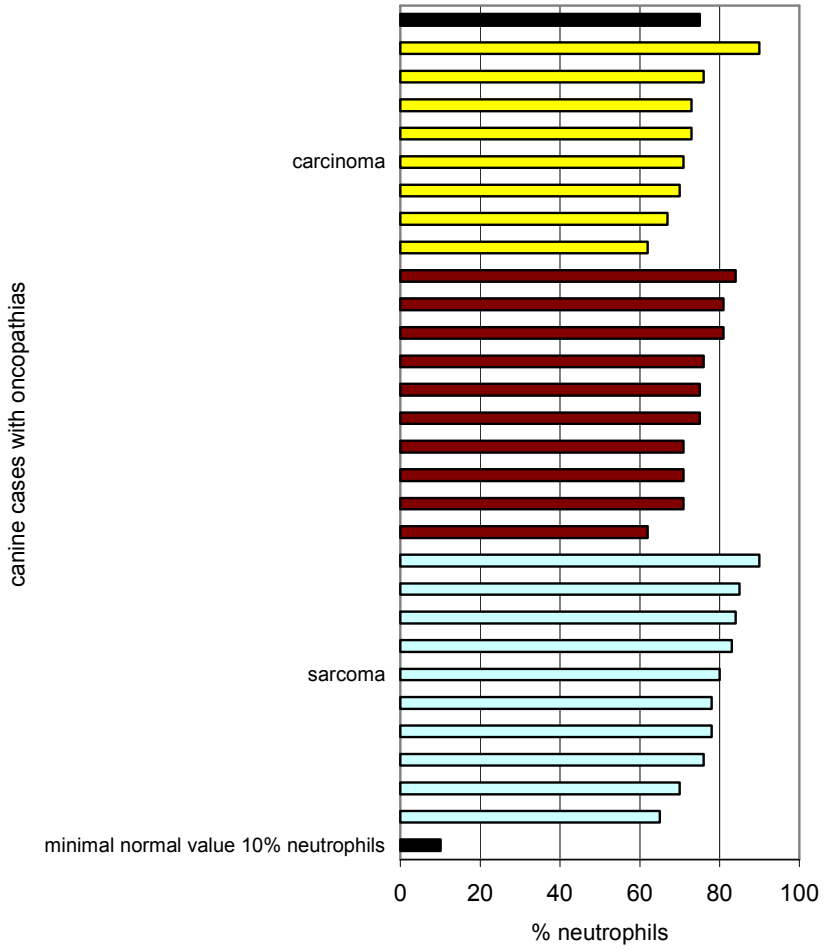

Chart 4. Percentage of neutrophil granulocytes from the leukocytary formula in 28 investigated dogs (2 cases aren't register on accont of pancytopenia) related to the normal minimal percentage 10% neutrophils and to the maximal normal percentage 75% neutrophils

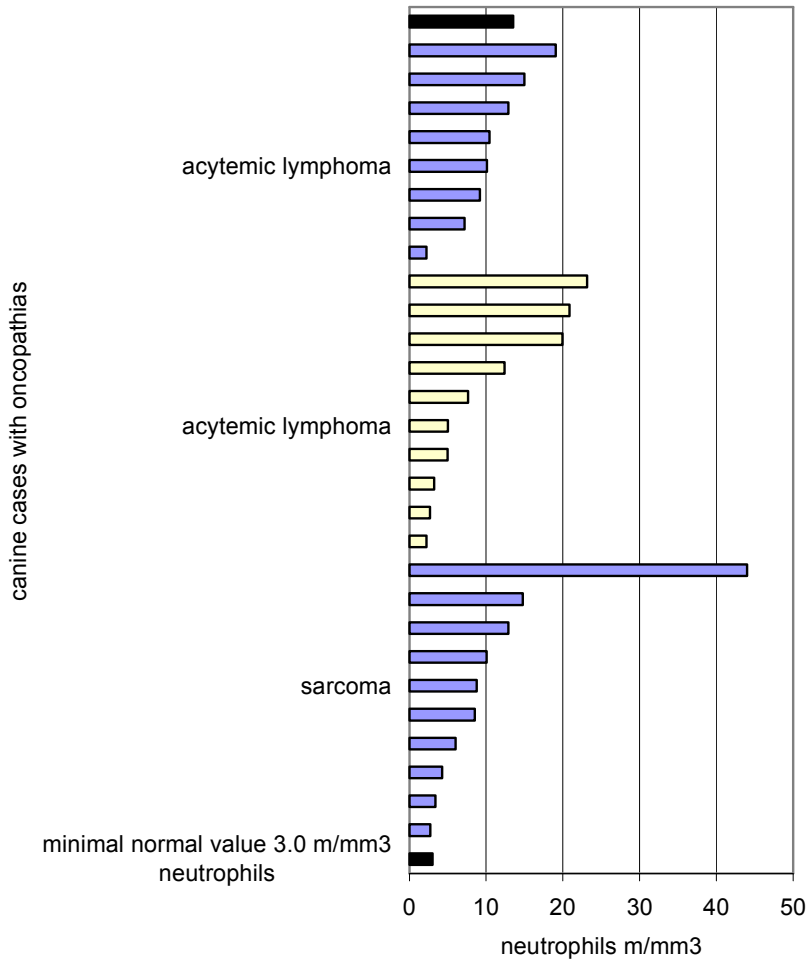

Chart 5. Absolute number of neutrophil granulocytes from the leukocytary formula in 28 investigated dogs (2 cases aren't register on account of pancytopenia) related to the minimal normal value 3.0 m/ml^3 neutrophils and to the maximal normal value 13.5 m/ml^3 neutrophils

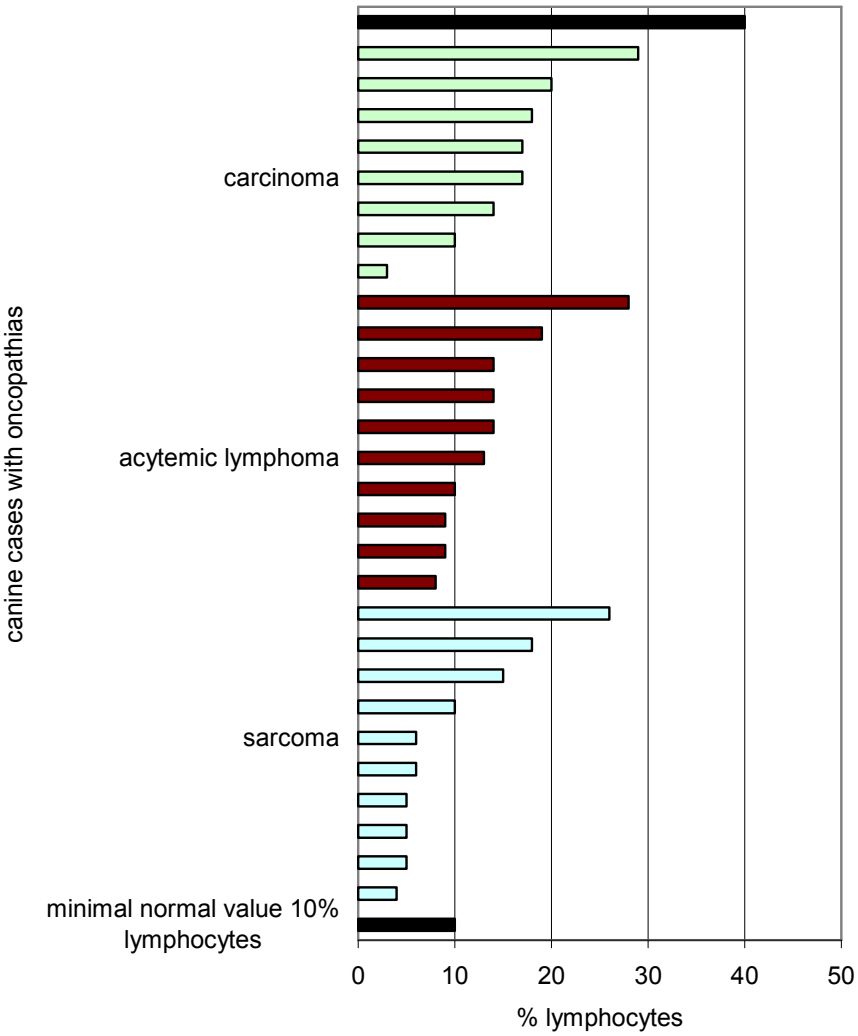

Chart 6. Percentage of lymphocytes from the leukocytary formula in 28 investigated dogs (2 cases aren't register on accont of pancytopenia) related to the normal minimal percentage 10% lymphocytes and to the maximal normal percentage 40% lymphocytes

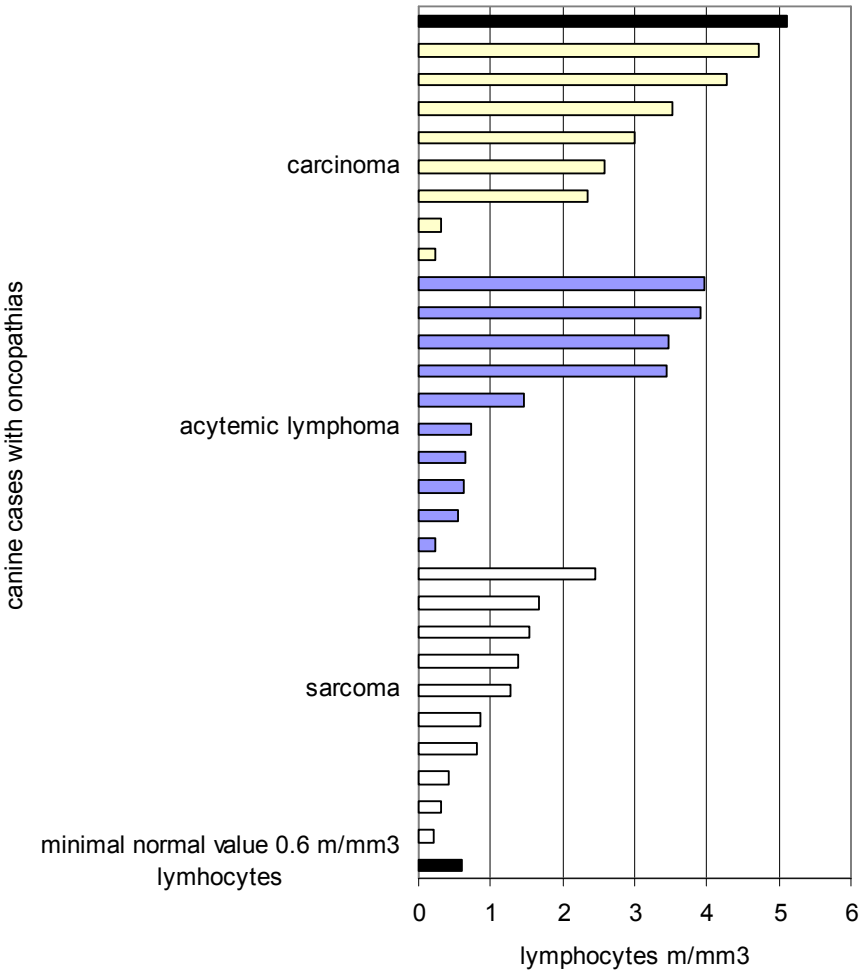

Chart 7. Absolute number of lymphocytes from the leukocytary formula in 28 investigated dogs (2 cases aren't register on account of pancytopenia) related to the minimal normal value 0.6 m/ml^3 lymphocytes and to the maximal normal value 5.1 m/ml^3 lymphocytes

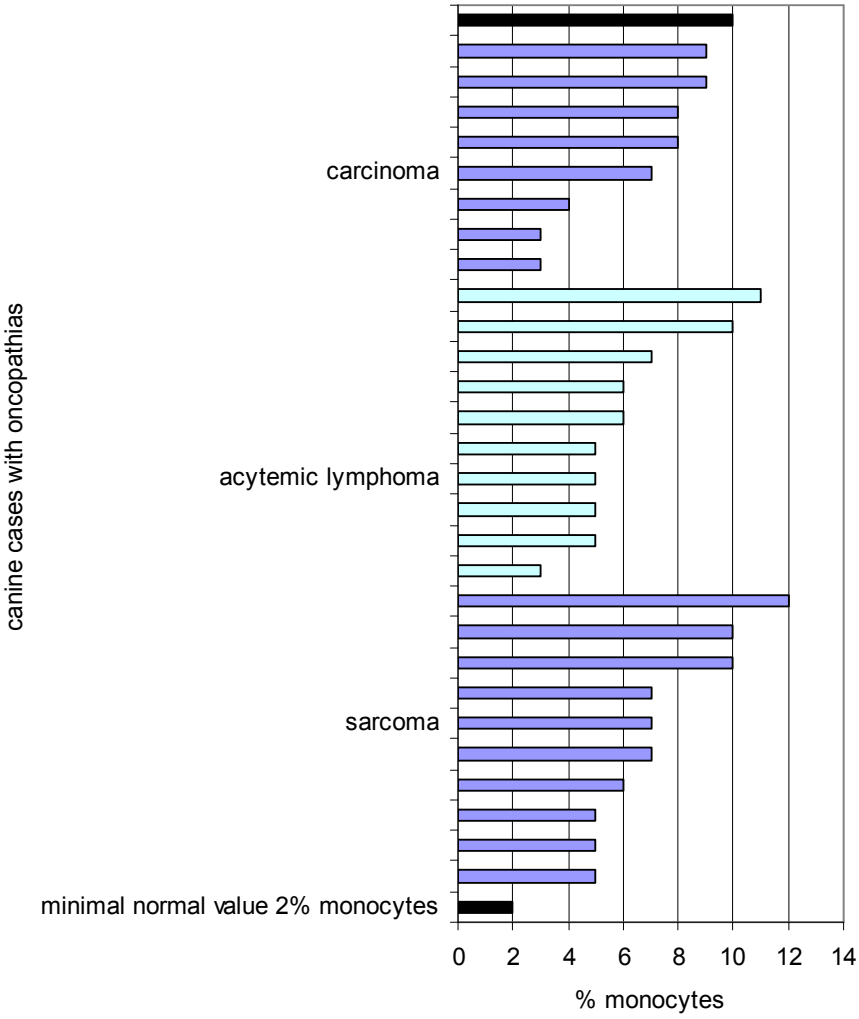

Chart 8. Percentage of monocytes from the leukocytary formula in 28 investigated dogs (2 cases aren't register on account of pancytopenia) related to the normal minimal percentage 2% monocytes and to the maximal normal percentage 10% monocytes

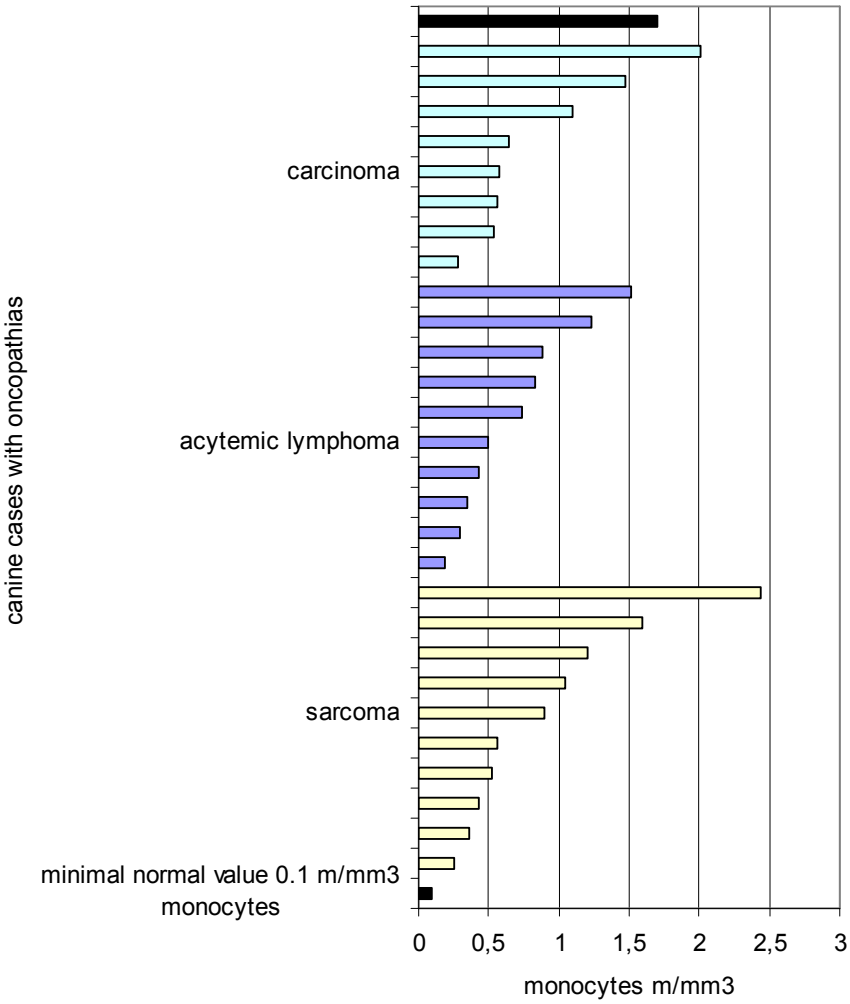

Chart 9. Absolute number of monocytes from the leukocytary formula in 28 investigated dogs (2 cases aren't register on account of pancytopenia) related to the minimal normal value 0.6 m/ml^3 lymphocytes and to the maximal normal value 5.1 m/ml^3 monocytes

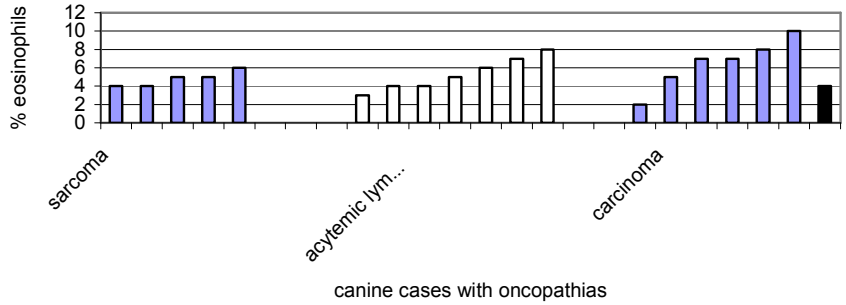

Chart 10. Percentage of eosinophils from the leukocytary formula in 28 investigated dogs (2 cases aren't register on accont of pancytopenia) related to the maximal normal percentage 4% eosinophils

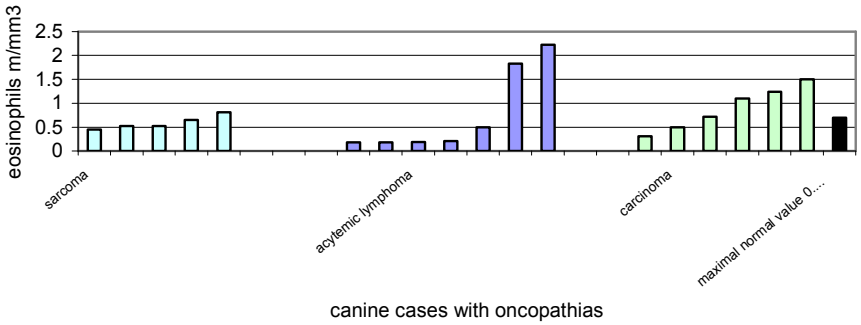

Chart 11. Absolute number of eosinophils from the leukocytary formula in 28 investigated dogs (2 cases aren't register on accont of pancytopenia) related to the maximal normal value 0.7 m/ml^3 eosinophils

- *Basophil granulocytes*

These cells weren't founded in any cytological exam of the blood in the 30th dogs.

- *N.K. cells*

Just in one case, with malign lymphoma (Immunoblastoma) we found N.K. 15% (1.05 m/ml^3) cells that represents a real hyperplasia of these cells.

- *Dendritic cells*

We weren't finding dendritic cells in any investigated case.

Conclusions

1. The most frequent haematological modification in the 30th evaluated cancerous dogs were anemia (of different degrees of severity) founded on 8 cases with sarcoma, 7 with acytemic lymphoma and 7 with carcinoma. This means 76.7% from all dogs.
2. THR values: trombocytopenia was found in 40% from investigated dogs (5 cases with sarcoma, 4 with acytemic lymphoma and 3 with carcinoma); normal trombocyte values were found in 53.3% from animals (5 cases with sarcoma, 6 with acytemic lymphoma and 5 with carcinoma) and trombocytosis was found in 6.7% from cases (2 cases with carcinoma).
3. Normal leukocyte number was found in 53.3% from evaluated dogs (8 cases with sarcoma, 4 with acytemic lymphoma and 4 with carcinoma), leukopenia in 36.6% from dogs (1 case with sarcoma, 3 with acytemic lymphoma and 3 with carcinoma) and leukocytosis in 23,3% from cases (1 cases with sarcoma, 3 with acytemic lymphoma and 3 with carcinoma).
4. In two cases with carcinoma we found pancytopenia.
5. Leukopenia was own to the low values of all WBC cellular series.
6. The dogs with normal total leukocyte values have a normal leukocytary formula or a slow increased neutrophil granulocyte values.
7. Leukocytosis is owned to the rise value of neutrophil granulocytes.

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