HAEMATOLOGICAL MODIFICATIONS IN SOME MALIGNANT TUMOURS OF COMPANION ANIMALS

CRENGUȚA PAVEL*, N. MANOLESCU**

*Faculty of Veterinary Medicine Bucharest  
**Institute of Oncology Bucharest

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 tumoral 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

<table>
<thead>
<tr>
<th>No.</th>
<th>Diagnosis</th>
<th>WBC mm$^{-3}$</th>
<th>Percentage of leukocytes (%)</th>
<th>Absolute leukocytes count (leukocyte mm$^{-3}$/blood)</th>
<th>RBC M$^{-3}$</th>
<th>Hb g/dl</th>
<th>THR m/mm$^3$</th>
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<td>1</td>
<td>Mesenchymic fibrosarcoma</td>
<td>5.64</td>
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<td>PC 3</td>
<td>PC 4</td>
<td>PC 5</td>
<td>PC 6</td>
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<td>7.3</td>
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</table>

*Due to pancytopenia white blood cells can't be count and the leukocytyar formula can't be done.*
According to Table 1 the hematological results can be classified as follows:

- The 10th dogs with sarcoma shows:
  - leukopenia (1.5-5 WBC m/ml³) - 1 case;
  - normal leukocyte number (5-17 WBC m/ml³) - 8 cases;
  - leukocytosis – (17-50 WBC) m/ml³ - 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 account 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/mm\(^3\) neutrophils and to the maximal normal value 13.5 m/mm\(^3\) neutrophils.
Chart 6. Percentage of lymphocytes from the leukocytary formula in 28 investigated dogs (2 cases aren’t register on acount 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 leukocytic formula in 28 investigated dogs (2 cases aren’t register on account of pancytopenia) related to the minimal normal value 0.6 m/ml³ lymphocytes and to the maximal normal value 5.1 m/ml³ lymphocytes.
Chart 8. Percentage of monocytes from the leukocyte 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/ml³ lymphocytes and to the maximal normal value 5.1 m/ml³ monocytes.
Chart 10. Percentage of eosinophils from the leukocytary formula in 28 investigated dogs (2 cases aren’t register on account 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 account of pancytopenia) related to the maximal normal value 0.7 m/ml³ 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/ml³) 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 owned 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.

References