RESEARCHES REGARDING THE HEMATOLOGICAL PROFILE OF HAFLINGER AND LIPIZZAN HORSES

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Summary

Taking into account the fact that blood, through its constituents, represents the mirror of the animal health (reacting rapidly and many times specifically to the aggressions caused by external and internal factors); we have chosen to carry out some hematological investigations in clinically-healthy animals. The quantitative change of the sanguine constituents represents a diagnosis revealer and it is the consequence of some functional disorders – either organic lesions, or caused by the self-defense reaction as a results of some aggressions. Their dosing allows the assessment of a disease prognostication, too. Current pathology orientation towards the insight of the metabolic health aims at the discovery, as early as possible, of the critical metabolic area between normal and abnormal, at the prevention of the clinical diseases and at the establishment of the limits of physical oscillations caused by different internal metabolites; such variations represent undoubtedly a useful step in the achievement of data with regards to the future prevention of dismetabolies.

The objective of this paper work was to establish the reference data concerning the hematological profile in two horse breeds: Haflinger and Lipizzan, used as recreation animals.

The paraclinic investigation were made on Haflinger and Lipizzan horses from Hungary and Sâmbăta de Jos stud farm. The blood samples were taken from 14 horses (7 samples from Haflinger and 7 samples from Lipizzan horses).

From the hematological parameters investigated, semnificative higher values were found in hematocrit, hemoglobin and VEM at Lipizzan horses compared to Haflinger horses. In the first 30 minutes, VSH has higher medium values at Haflinger horses compared to Lipizzan horses, without outrun the normal limits recomanded by the literature.

***Keywords**: horse, hematological, variation, blood, Lipizzan, Haflinger*

Materials and methods

In laboratory, we have determined the following: number of erythrocytes (hemo-cytometric); hematocrit (the micro-method Wintrobe); hemoglobin concentration (the method Sahli); number of leukocytes (hemo-cytometric); leukocyte formula (the method M.G.G.); number of thrombocytes (the direct method von Herwerden); VSH (the method Westergreen). Data achieved was processed by bio-statistical methods, using the software Excel for calculations. In order to test the difference significance, we have applied the test Mann-Whitney.

The daily animal intake had the following composition:

- natural hay 15-20 kg/day; its chemical analysis has confirmed the following amounts: crude protein 9.33%; humidity 9.23%; cellulose 30.63%;

- concentrated feed 4 kg/day (2 kg oat and 2 kg maize); concentrates` chemical analysis has confirmed: crude protein 9.32%, humidity 10.62%;
- vitamin-mineral premix 100 g.

Results and discussions

The values of the hematological parameters of the Haflinger horses are presented in Table 1. Analyzing the situation from the table, we may observe that the number of erythrocytes had a mean value of 7.09 ± 0.46 mil/mm^3, with a variation coefficient (VC) of 17.28%.

Table 1

The comparative evolution of hematological parameters in horses (n = 7) and the significance of the differences

Specification		X ± Sx	CV%	Differences		Significances (Mann-Withney)
				abs	%	
Erythrocytes (mii/mm³)	Lipizzan	7.75 ± 0.35	12.12	-0.66	8.51	0.4432
	Haflinger	7.09 ± 0.46	17.28			
Hematocrit (%)	Lipizzan	47.43 ± 1.09	6.07	-15.57	32.82	0.0017
	Haflinger	31.86 ± 2.06	17.14			
Hemoglobin (g/dl)	Lipizzan	14.34 ± 0.40	7.45	-2.25	15.69	0.0088
	Haflinger	12.09 ± 0.49	10.68			
VEM (µ³)	Lipizzan	61.62 ± 1.57	6.73	-16.39	26.59	0.0026
	Haflinger	45.23 ± 2.24	13.15			
HEM (pg)	Lipizzan	18.73 ± 0.91	12.90	-1.49	7.95	0.1102
	Haflinger	17.24 ± 0.65	10.00			
CHEM (g/dl)	Lipizzan	30.31 ± 0.95	8.34	+.8.06	26.59	0.0026
	Haflinger	38.37 ± 1.36	9.37			
Leukocytes (mii/mm³)	Lipizzan	8.86 ± 0.25	7.46	+0.2	2.25	0.6092
	Haflinger	9.06 ± 0.33	9.77			
Neutrophils (%)	Lipizzan	55.71 ± 0.92	4.36	-0.42	0.75	0.8983
	Haflinger	55.29 ± 1.21	5.79			
Lymphocytes (%)	Lipizzan	34.71 ± 0.75	5.69	-1,00	2,88	0,3379
	Haflinger	33,71 ± 1,02	7,98			
Eosinophils (%)	Lipizzan	5,57 ± 0,30	14,12	-0,43	7,71	0,4062
	Haflinger	5,14 ± 0,26	13,42			
Basophils (%)	Lipizzan	0,00 ± 0,00	0,00	+0,14	0	0,6547
	Haflinger	0,14 ± 0,14	26,45			
Monocytes (%)	Lipizzan	4,00 ± 0,38	25,00	+0,29	7,25	0,6092
	Haflinger	4,29 ± 0,42	25,96			
Thrombocytes (mii/mm³)	Lipizzan	350,03 ± 0,49	0,37	-1,17	0,33	0,2013
	Haflinger	348,86±0,45	0,34			
VSH 15'	Lipizzan	29,57 ± 0,97	8,70	19,86	67,16	0,0032
	Haflinger	49,43 ± 3,68	19,75			
VSH 30'.	Lipizzan	49,29 ± 1,66	8,90	+20,28	41,14	0,0180
	Haflinger	69,57 ± 4,29	16,32			
VSH 60'	Lipizzan	100,71 ± 4,06	10.69	-6.28	6.23	0.3711

	Haflinger	94.43 ± 2.78	7.80			
VSH 24 h	Lipizzan	150.86 ± 2.57	4.52	-14.57	9.65	0.0151
	Haflinger	136.29 ± 3.19	6.19			

The hematocrit had the value of 31.86 ± 2.06%. with a rather high VC – 17.14%; the hemoglobin concentration was 12.09 ± 0.49 g/dl, with a VC of 10.68. The erythrocyte constants derived had the following values: VEM = 45.23 ± 2.24 μ^3; HEM = 17.24 ± 0.65 pg, a significantly low value compared with the data available in the literature of specialty (32 – 55 pg); CHEM had a value of 38.37 ± 1.36 g/dl, a significantly high value compared to the data available in literature (31 – 35 g/dl).(4)

The leukocyte number in the Haflinger horses was 9.06 ± 0.33 thousand/mm^3. The percentage distribution of the components of the figurate elements within the leukocyte formula is respected in the case of this breed; the neutrophils are dominant, with a percentage of 55.29 ± 1.21 (4).

The thrombocytes number was 348.86 ± 0.45 thousand/mm^3. On the whole, it is concordant with the data available in the literature of specialty (310.0 – 600.0 thousand/mm^3).

VSH had a higher value during the first 15 minutes (49.43 ± 3.68) compared to the value of 32.0 specified by the literature of specialty, but after 24 hours it became 136.29 ± 3.19, almost identical with the value recommended by the literature.(3)

Within the Table 1, we also show the hematological constants present in the Lipizzan breed (n=7). We may notice that the number of erythrocytes in Lipizzan horses was 7.75 ± 0.35, with a VC of 12.12%. The hematocrit had a value of 47.43 ± 1.09%, and the hemoglobin 14.34 ± 0.40 g/dl. In comparison with the well-bred horses, VEM had a high value – 61.62 ± 1.57 μ^3 compared to the data available in the literature of specialty which takes into consideration the well-bred horse, whose VEM is 37.0 – 58.5 μ^3. HEM had the value 18.73 ± 0.91 pg, and it is concordant with the limits recommended for the well-bred horse (12.3 – 19.7 pg). CHEM value (30.31 ± 0.95 g/dl) is similar to the values recommended by the literature of specialty for the well-bred horse (31.0 – 38.6 g/dl). (1, 2, 3)

The leukocyte number was of 8.86 ± 0.25 thousand/mm^3, and the leukocyte formula respects the proportions established in previous researches; the neutrophil proportion was higher in a single situation (55.71 ± 0.75).

The thrombocyte number in Lipizzan horses was of 350.03 ± 0.49 thousand/mm^3, a similar value with the one determined in the Haflinger horses.

As regarding VSH, during the first 15 minutes we have noticed a value of 25.57 ± 0.97, similar to the value achieved for the Haflinger horses. Conversely, after 24 hours, the value found by us was 150.87 ± 0.57, significantly higher than that recommended by the literature of specialty (140.0). (1)

Conclusions

Successive to the comparative study upon the evolution of some sanguine hematological parameters in Lipizzan and Haflinger horses, we may draw the following conclusions:

- the hematocrit, hemoglobin and VEM record higher specific values ($p<0.01$) in the Lipizzan horses compared to Haflinger;
- we have not observed any significant differences concerning the total number of leukocytes and the configuration of the leukocyte formula;
- VSH, during the first 30 minutes, presents average values much bigger in the Haflinger horses, compared to the Lipizzan ones ($p<0.01$), but these values are concordant to the limits recommended by the literature of specialty.

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