

A study on some normal hematological values in foals and arabian horses at different ages

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Summary

Hematological values of twenty normal male foals at 1-6 months , 7-12 months and sixty Arabian horses at 1-5 years old were estimated respectively .

Red blood cell count (RBCS) , hemoglobin concentration (Hb) , packed cell volume (PCV%) , mean corpuscular volume (MCV) , mean corpuscular hemoglobin (MCH) , mean corpuscular hemoglobin concentration (MCHC) , differential leukocyte count , total serum protein were determined using several laboratory techniques .

These changes of these parameters were presented in tables in relation to the ages of these animals .

Introduction

The estimation of normal hematological values are valuable as an assessment for physiological fitness and diagnosis of the disease (1,2) .

In equine practice it is often difficult to interpret the results of hematological and biochemical examination of foals because there are few standard values for comparison , particularly in relation to age after birth (3) .

In recent years there has been greater awareness of the changes that can occur in hematological results due to excitement of the horses during venipuncture and collection of the sample (4,5) .

The present work was performed in order to determine a number of some hematological parameters in the foals of Arabian horses at different ages and also in the adult horses .

Materials and methods

The study was conducted on twenty Arabian foals their ages were 1-6 and 7-12 months respectively . Twenty five Arabian horses there ages ranged between 1-2 years . The other group included 35 horses between 3-5 years old at the Military Academic and Al- Furusiya Club West of Baghdad province . All the animals were males .

Every effort was made to take the blood samples without excitement .

2ml of blood sample was collected from the jugular vein of each animal with anticoagulant tubes (EDTA) . Total red blood cell counts (RBCs) and white blood cell counts (WBCS) were determined using a haemocytometer technique , hemoglobin concentration (gm / dl) by Sahil method , packed cell volume (PCV%) using micro haemotocrit centrifuge .

Mean corpuscular volume (MCV) , mean corpuscular hemoglobin (MCH) and mean corpuscular hemoglobin concentration (MCHC) were calculated (6) .

Differential leukocyte counts were determined on at least 200 cells from thin blood smears stained with Wright stain .

The total plasma protein (gm / L) were determined by refractometer (4) .Analysis of data T test was performed (7) .

Results

The results of the hematological values were summarized in the table 1 and 2; which showed the mean and standard deviation (SD) of the blood values for the horses at different ages . Analysis of the data revealed that there were significant ($P > 0.05$) differences in the RBCs counts , Hb, PCV , MCV , MHC and MCHC in the foals at 7-12 months and in the horses at 1-2 year

old . Total Plasma protein was comparable ($P>0.05$) in all animals .

The WBCs counts were lower ($P< 0.05$) in the foals at 7-12 months and in horses at 1-2 years old . There was a significant ($P<0.05$) decrease in the Neutrophils in 7-12 months and the horses at 1-2 year old .

The Lymphocyte and Eosinophils counts were lower ($P<0.05$) in foals at 1-6 months and in horses at 3-5 years old .

Table (1)
Erythrocytes parameters and total plasma protein using SI units (Mean \pm SD)

Age of horses	Number examined	RBCs $\times 10^{12}$ / L	Hb gm / L	PCV L / L	MCV Ft	MCH Pg	MCHC %	Total p.p. gm/ L
1-6 months	10	6.22 \pm 0.97	124 \pm 25.1	0.368 \pm 0.026	60.8 \pm 3.97	19.76 \pm 1.22	33.72 \pm 0.57	70.6 \pm 7.3
7-12 months	10	5.6 \pm^* 0.56	109 \pm^* 12.7	0.325 \pm^* 0.0153	54.1 \pm^* 5.89	19.44 \pm^* 0.30	33.51 \pm^* 0.26	69 \pm 1.4
1-2 years	25	5.43 \pm^* 0.37	96.2 \pm^* 10.5	0.321 \pm^* 0.016	53.44 \pm^* 4.19	17.71 \pm^* 1.13	33.06 \pm^* 1.50	70.8 \pm 6.7
3-5 years	35	6.42 \pm^* 0.64	126 \pm 13.3	0.377 \pm 0.021	58.67 \pm 1.64	19.59 \pm 0.52	33.5 \pm 0.37	77 \pm 4

* $P< 0.05$

Table (2)
Total and differential and Absolute leukocytic counts
(Mean \pm SD)

Age of horses	Number examined	Total WBC S X10 ⁶ /L	Differential leukocytic counts %				
			Neutrophils	Lymphocytes	Monocytes	Eosinophils	Basophils
1-6 months	10	10.3 \pm 2.19	56.2 \pm 13 5.911 \pm 2.38	39.8 \pm 12 1.073 \pm 0.48*	2.6 \pm 1.2 0.148 \pm 0.12	3.6 \pm 2.6 * 0.358 \pm 0.23	0(0 \pm 0) -
7-12 months	10	7.5 \pm 0.70	37 \pm 4.2 * 3.20 \pm 0.57	56 \pm 4.2 4.26 \pm 0.08	2 \pm 1.4 0.146 \pm 0.12	5 \pm 1.4* 0.30 \pm 0.128	0(0 \pm 0) -
1-2 years	25	7.65 \pm 1.18	37 \pm 8.34 * 2.881 \pm 0.10 1	57 \pm 9.25 4.246 \pm 0.798	1.3 \pm 0.5 0.122 \pm 0.10	5.5 \pm 2.9 0.428 \pm 0.20	0(0 \pm 0) -
3-5 years	35	9.75 \pm 2.06	59 \pm 9.9 5.895 \pm 0.218	37.8 \pm 9.4 * 3.549 \pm 0.535	1.5 \pm 0.54 0.146 \pm 0.06	1.6 \pm 0.54 * 0.147 \pm 0.064	0(0 \pm 0) -

* P<0.05

Discussion

1-Foals at 1-6 months oldThe RBCs in this age were lower in comparison in the Thoroughbred foals (3);but the PCV and Hb were similar (36.8 V.S 38%;12.4 V.S 12.8 gm / dl) respectively (3) . The reduction in RBCs count may be due to breed difference . The MCV was higher than that recorded by (3 and 8) ; and this increase may be related to the lower RBCs count in our results .

Ralston et al ., (9) recorded that the MCV is increased from birth to three years old .

2-Foals at 7-12 months old .

The RBCs , Hb, PCV, MCV, MCH and MCHC were in agreement with that reported by (8) .

3-Yearlings horses (1-2 years)

The RBCs count and the PCV were lower but the MCV,MCH and MCHC were comparable as reported by (8) . These parameters were lower in that recorded in Thoroughbred horses (10) .

4-Horses at 3-5 years old .

The hematological values were comparable as reported by (8,11) , but the RBCs count was less as recorded in sixty clinically normal Arabian horses (12) (6-42 V.S. 8.71) .

Al-Izzi (13) reported similar hematological parameters in thirty clinically normal Arabian horses at 2-6 years old .

The leukolytic count :

The WBCs counts in foals at 1-6 months were comparable with that reported by (3) , but less than recorded by (8) . In horses 1-2 years old the result were comparable ($7.5 \times 10^9/L$ V.S $8.1 \times 10^9/L$) as reported by (5) . In the horses 3-5 years old the counts were ($9.75 \times 10^9/L$) and were comparable in that reported by (12,13) .

The T.S.P. in foals at 1-6 months was higher (70.6 gm/L) than that reported in Thoroughbred foals (3) . In 7-12 months old was comparable with (8) and at yearling horses was (70.8 gm/L) comparable with (14 and 15).

Finally in the horses at 3-5 years the T.S.P. was similar to that reported by (13;16 and 17) .

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دراسة بعض أقيام الصورة الدموية الطبيعية في الأمهار والخيول العربية في أعمار مختلفة

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الخلاصة

لقد تم قياس الأقيام الدموية لعشرين مهراً طبيعياً تراوحت أعمارهم بين (1-6) شهراً و (7-12) شهراً وستون حصاناً عربياً تراوحت أعمارهم بين (1-5) سنوات ، على التوالي .
شملت الفحوصات : حساب عدد كريات الدم الحمر ، الهيموكلوبين ، حجم كريات الدم الحمر المرصوصة معدل الحجم الكروي ، معدل خضاب الدم الكروي ومعدل تركيز خضاب الدم الكروي . حساب عدد كريات الدم البيض ، والعد الفارق لها ، حساب تركيز بروتينات مصل الدم الكلي . وذلك باستعمال عدة تقنيات مختبرية .
وان هذه التغيرات لهذه المعايير الدموية عرضت بشكل جداول وذلك بالعلاقة مع الأعمار المختلفة لهذه الحيوانات .