Some haematological values of Irish Wolfhounds in Australia

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Irish Wolfhounds are a breed of dog originally used to hunt by chasing quarry. They belong to a group of breeds commonly referred to as sighthounds. Other breeds in this category include the Greyhound, the Afghan Hound, the Saluki, the Whippet and the Scottish Deerhound. Reports of haematological values have been published for the Greyhound[1-6] and for the Afghan Hound, the Saluki and the Whippet.[7] There have been no previous reports of haematological values for the Irish Wolfhound.

The current study undertook to establish normal haematological values for a population of Irish Wolfhounds and to compare these values with those from other sighthound breeds and non-sighthound breeds.

Blood was collected from 22 Irish Wolfhounds (14 females and 8 males), ranging in age from 16 months to 9 years, by cephalic venepuncture, into tubes with EDTA anticoagulant. Genetically these dogs were probably representative of the Irish Wolfhound population in Australia. Samples were stored on ice and processed within 3 h of collection. Haematological values, including erythrocyte count, total leukocyte count, platelet count and MCV, were determined using an impedance counter (Coulter S Plus 4, Coulter Electronics Inc, Hialeah, FL, USA). Haemoglobin was measured by the cyanmethaemoglobin method.

MCH and MCHC were automatically calculated from the measured values. A 'microhaematocrit' PCV and a manual differential leukocyte count, on Romanowsky-stained blood smears, were also performed. A refractometer was used to determine the total plasma solids.

Student's *t* test, with allowance for unequal variances, was used to compare means. A $P < 0.05$ was considered to be statistically significant.

The results of the haematological assessment are stated in Tables 1 and 2. Occasional reactive lymphocytes were observed in 32% (7/22) of dogs in the present study. No basophils were observed.

The distribution of data was assessed by the Kolmogorov-Smirnov test. Packed cell volume, red cell count, haemoglobin concentration, MCV, total leukocytes, segmented neutrophils, lymphocytes, eosinophils and platelets, and total solids concentration were normally distributed. The MCH and MCHC values, and band neutrophils and monocytes were not normally distributed. Log_{10} transformation of data resulted in monocytes being normally distributed, but not the MCH and MCHC values. Such transformation was not undertaken for the band neutrophils.

The haematological characteristics of most breeds of sighthounds have traditionally been assumed to be similar to the Greyhound. The Greyhound typically has higher PCV, haemoglobin concentration, MCV and MCHC, and lower platelet numbers, compared with non-sighthound breeds.[3-6] Another study found that the PCV and haemoglobin concentration of the Afghan Hound, Saluki and Whippet were also greater than those reported for non-sighthound breeds.[7] A model of stem cell competition has been proposed to explain the 'decreased' platelet numbers in the presence of 'increased' erythrocyte values in Greyhounds.[8] The total and differential leukocyte counts, and total plasma solids have not been previously reported for any sighthounds other than the Greyhound.

There were no significant differences between the male and female Irish Wolfhound groups in the present study.

The PCV of the Irish Wolfhounds was less than that reported for Greyhounds[6] and other breeds of sighthounds[7] and corresponded to values for non-sighthound breeds.[6,9] The haemoglobin concentration in Irish Wolfhounds was lower than the values for other sighthounds and corresponded with the haemoglobin values of non-sighthound breeds. The number of red cells in the Irish Wolfhounds studied was similar to the values reported for both the Greyhound and non-sighthound breeds.

The MCV of the Irish Wolfhounds studied was less than that reported for Greyhounds and corresponded with the values of non-sighthound breeds. The MCH was statistically different for all classes of dogs, with the Greyhound having the highest MCH and the non-sighthound breeds being the lowest. The MCHC was similar in all classes of dog.

The platelet number in the Irish Wolfhounds in the present study was lower than that encountered with non-sighthound breeds[6,9] but higher than that encountered in Greyhounds,[6] while their erythrocytic values (PCV, haemoglobin and erythrocyte count) were similar to non-sighthound breeds. This obser-

Table 1. Comparison of haematological values (means ± SD) of Irish Wolfhounds and other breeds of dog.

Value	Present study	Sullivan et al[6]	
	Irish Wolfhounds	Greyhounds	Non-sighthound breeds
	n = 22	n = 36	n = 22
PCV (L/L)	0.49 ± 0.04^{A}	0.54 ± 0.04^{B}	0.47 ± 0.04^{A}
Red cell count (x10^{12}/L)	6.8 ± 0.6^{AB}	6.7 ± 0.4^{A}	7.1 ± 0.4^{B}
Haemoglobin (g/L)	17.4 ± 1.5^{A}	19.9 ± 1.6^{B}	17.5 ± 1.3^{A}
MCV (fL)	66.8 ± 1.8^{A}	81.2 ± 8.2^{B}	65.6 ± 2.9^{A}
MCH (pg)	25.5 ± 1.0^{A}	30 ± 3.1^{B}	24.7 ± 1.2^{C}
MCHC (g/L)	38.3 ± 0.6^{A}	37.1 ± 1.5^{A}	37.7 ± 2.0^{A}
Leukocyte count (x10^{9}/L)	8.4 ± 1.5^{A}	7.9 ± 2.6^{A}	7.4 ± 2.9^{A}
Bands (%)	1.3 ± 1.1		
Neutrophils (%)	63.3 ± 9.4		
Lymphocytes (%)	20.1 ± 7.2		
Monocytes (%)	8.6 ± 3.4		
Eosinophils (%)	6.7 ± 4.3		
Bands (x10^{9}/L)	0.1 ± 0.09^{A}	0.02 ± 0.05^{B}	0.01 ± 0.01^{B}
Neutrophils (x10^{9}/L)	5.3 ± 0.8^{A}	5.8 ± 2.3^{A}	5.0 ± 3.0^{A}
Lymphocytes (x10^{9}/L)	1.7 ± 0.1^{A}	1.7 ± 0.8^{A}	2.2 ± 1.2^{A}
Monocytes (x10^{9}/L)	0.7 ± 0.06^{A}	0.2 ± 0.2^{B}	0.1 ± 0.2^{B}
Eosinophils (x10^{9}/L)	0.6 ± 0.05^{A}	0.07 ± 0.09^{B}	0.08 ± 0.1^{B}
Platelets (x10^{9}/L)	196 ± 48^{A}	154 ± 43^{B}	238 ± 52^{C}
Total plasma solids (g/L)	67.1 ± 2.6^{A}	62 ± 4.0^{B}	67 ± 4.0^{A}

Sullivan et al[6] used an impedance counter (Coulter Counter Zf).
Means within a row with different superscripts are significantly different ($P < 0.05$).

MCV	Mean cell volume
MCH	Mean corpuscular haemoglobin
MCHC	Mean corpuscular haemoglobin concentration
PCV	Packed cell volume

Table 2. Range of haematological values observed in Irish Wolfhounds.

Variable	Value
PCV (L/L)	0.40 - 0.57
Red cell count ($x10^{12}$/L)	5.7 - 8.1
Haemoglobin (g/L)	14.4 - 20.4
MCV (fL)	64 - 70
MCH (pg)	24 - 27
MCHC (g/L)	37 - 40
Leukocyte count ($x10^9$/L)	5.3 - 11.6
Bands ($x10^9$/L)	0 - 0.3
Neutrophils ($x10^9$/L)	3.7 - 6.9
Lymphocytes ($x10^9$/L)	1.5-1.9
Monocytes ($x10^9$/L)	0.3 - 1.6
Eosinophils ($x10^9$/L)	0.4 - 0.8
Platelets ($x10^9$/L)	110 - 280
Total plasma solids (g/L)	61 - 73

vation suggests that the reason for lower platelet counts in Greyhounds when compared to non-sighthounds may not be simply a result of 'stem cell competition', as previously suggested.[8]

The total leukocyte values in the Irish Wolfhounds in the present study corresponded to values reported for both the Greyhound and non-sighthound breeds.[4,6,9] In the differential leukocyte count the absolute neutrophil and lymphocyte values corresponded with previously reported values for both Greyhound and non-sighthound breeds,[6] however, the values for band neutrophils, monocytes and eosinophils were higher than in either the Greyhound or non-sighthound breeds. No 'grey' eosinophils[10] were observed.

The total plasma solids were similar to non-sighthound breeds and higher than values encountered with the Greyhound.[6]

The present study shows that the Irish Wolfhound has haematological values with characteristics of both Greyhounds and non-sighthound breeds. Hence, the traditional use of Greyhound haematological data is inappropriate for the assessment of haematology in the Irish Wolfhound.

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References

1. Porter JA, Canaday WR. Hematologic values in mongrel and greyhound dogs being screened for research use. *J Am Vet Med Assoc* 1971;159:1603-1606.
2. Heneghan T. Haematological and biochemical variables in the greyhound. *Vet Sci Commun* 1977;1:277-284.
3. Lassen ED, Craig AM, Blythe LL. Effects of racing on hematologic and serum biochemical values in Greyhounds. *J Am Vet Med Assoc* 1986;188:1299-1303.
4. Snow DH, Harris RC, Stuttard E. Changes in haematology and plasma biochemistry during maximal exercise in greyhounds. *Vet Rec* 1988;123:487-489.
5. Ilkiw JE, Davis PE, Church DB. Hematologic, biochemical, blood-gas, and acid-base values in greyhounds before and after exercise. *Am J Vet Res* 1989;50:583-586.
6. Sullivan PS, Evans HL, McDonald TP. Platelet concentration and hemoglobin function in greyhounds. *J Am Vet Med Assoc* 1994;205:838-841.
7. Hilppö M. Some haematological and clinical-chemical parameters of sight hounds (Afghan hound, Saluki and Whippet). *Nord Veterinaermed* 1986;38:148-155.
8. McDonald TP, Sullivan PS. Megakaryocytic and erythrocytic cell lines share a common precursor cell. *Exp Haematol* 1993;21:1316-1320.
9. Jain NC. The dog: normal hematology with comments on response to disease. In: *Schalm's veterinary haematology.* 4th edn. Lea and Febiger, Philadelphia, 1986:103-125.
10. Jones RF, Paris R. The greyhound eosinophil. *J Small Anim Pract* 1963;4(Suppl):29-33.

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CORRESPONDENCE

Modes of treatment

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The article 'Modes of treatment' (*Aust Vet J* 1997;75:260-261), by A Rijnberg, raises many interesting points. The author clearly points out some of the shortfalls of the conventional approach to veterinary treatment. He also quotes references which demonstrate how difficult it is to study and understand mechanisms behind the ways in which alternative therapies work. However, I would like to point out that it is wrong to conclude that a therapy is useless if its action cannot be explained.

Current approaches to treatment of diseases tend to analyse the problem by systems. In other words, we tend to consider the disease as belonging to one of several categories (cardiac, respiratory, skeletal, digestive, dermatological et cetera). Unfortunately, in approaching the problem in this fashion we tend to lose sight of the fact that the patient is a complex organism, in which all the systems are very closely interrelated.

It is relatively easy to measure variables within different body systems. However, at the moment our scientific knowledge is insufficient to monitor the effect of disease processes on a wholistic basis.

Many of the alternative therapies (such as homeopathy) approach diseases on a wholistic basis. Perhaps it will be possible to explain their mode of action if we incorporate modern concepts such as quantum mechanics and the chaos theory into medical science?

Reply

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In reply to D Wilson's letter I offer the following points:

- I did not conclude that a therapy is useless if its action cannot be explained.
- There is no need to search for the mode of action of alternative therapies because there is no evidence for their action.