

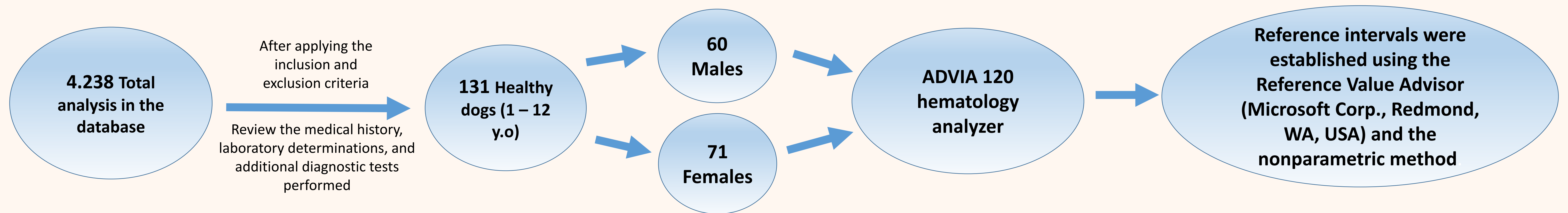


INTRODUCTION

Hematological reference intervals are an integral component of laboratory diagnostic tests which help to interpret the laboratory results and to establish the health status of animals. Each laboratory should establish its own reference intervals according to the population of animals in their environment and the instruments and methods employed.

OBJECTIVE

The aim of this study was to establish retrospectively canine hematologic reference intervals using the hematology analyzer ADVIA 120. Data obtained could be used as hematological reference intervals for the *Servicio de Hematología clínica Veterinaria (SHCV)*, Universidad Autònoma de Barcelona.



RESULTS

Tables 1, 2, 3 and 4 show hematological reference intervals obtained in the present study and reported in the literature for red blood cells, white blood cells, reticulocytes and platelets respectively.

Table 1

Parameter (units)	Reference intervals with ADVIA 120		Reference intervals from literature		
	Mean	Interval (minimum – maximum)	(Moritz <i>et al.</i> , 2004) ADVIA 120	(Bourgès-Abella <i>et al.</i> , 2011) Sysmex XT-2000iV	(Rizzi <i>et al.</i> , 2010)
RBC ($10^{12}/L$)	6,86	5,62 – 8,10	5,68 – 9,08	5,2 – 7,9	5,5 – 8,5
Hb (g/dL)	16,13	13,50 – 18,77	13,77 – 20,38	12,4 – 19,2	12,0 – 18,0
HCT (L/L)	0,50	0,40 – 0,60	0,42 – 0,62	0,35 – 0,52	0,37 – 0,55
MCV (fL)	71,32	64,01 – 78,64	62,7 – 74,56	60 – 71	60 – 77
MCH (pg)	23,74	20,91 – 26,57	20,46 – 24,81	21,9 – 26,3	19,5 – 24,5
CHCM (g/dL)	33,65	31,13 – 36,17	29,72 – 32,78	34,4 – 38,1	32,0 – 36,0
RDW (%)	14,76	13,23 – 16,30	12,00 – 13,15	13,2 – 19,1	-
HDW (g/dL)	1,97	1,58 – 2,37	1,24 – 1,82	-	-

Table 2

Parameter (units)	Reference intervals with ADVIA 120		Reference intervals from literature		
	Mean	Interval (minimum – maximum)	(Moritz <i>et al.</i> , 2004) ADVIA 120	(Bourgès-Abella <i>et al.</i> , 2011) Sysmex XT-2000iV	(Rizzi <i>et al.</i> , 2010)
WBC ($10^9/L$)	10,31	6,06 – 14,56	5,84 – 20,26	5,6 – 20,4	6 – 17
Neutrophils ($10^9/L$)	6,41	2,90 – 9,92	4,27 – 9,06	2,9 – 13,6	3 – 11,5
Eosinophils ($10^9/L$)	0,97	0,1 – 1,84	0,10 – 1,20	0,1 – 3,1	0,10 – 1,25
Basophils ($10^9/L$)	0,175	0,01 – 0,34	0,01 – 0,08	-	-
Lymphocytes ($10^9/L$)	3,21	1,39 – 5,04	2,04 – 4,66	1,1 – 5,3	1,0 – 4,8
Monocytes ($10^9/L$)	0,56	0,21 – 0,91	0,24 – 2,04	0,4 – 1,6	0,15 – 1,35

Table 3

Parameter (units)	Reference interval with ADVIA 120		Reference intervals from literature		
	Mean	Interval (minimum – maximum)	(Moritz <i>et al.</i> , 2004) ADVIA 120	(Bourgès-Abella <i>et al.</i> , 2011) Sysmex XT-2000iV	(Rizzi <i>et al.</i> , 2010)
Reticulocytes ($10^9/L$)	36,97	1,29 – 71,36	10,92 – 110,96	19,4 – 150,1	0 – 70
MCV (fL)	79,86	62,46 – 97,26	81,01 – 96,39	-	-
RDW (%)	20,95	12,50 – 29,41	11,00 – 19,54	-	-
CHCM (g/dL)	31,72	25,75 – 37,70	26,21 – 28,06	-	-
HDW (g/dL)	4,08	2,72 – 5,45	2,34 – 4,53	-	-

Table 4

Parameter (units)	Reference intervals with ADVIA 120		Reference intervals from literature		
	Mean	Interval (minimum – maximum)	(Moritz <i>et al.</i> , 2004) ADVIA 120	(Bourgès-Abella <i>et al.</i> , 2011) Sysmex XT-2000iV	(Rizzi <i>et al.</i> , 2010)
Platelet ($10^9/L$)	359,1	158,3 – 559,9	173,05 – 486,5	108 – 562	200 – 500
MPV (fL)	10,35	7,16 – 13,55	8,56 – 14,41	9,05 – 12,68	6,7 – 11,1
PDW (%)	52,26	39,19 – 65,33	55,71 – 66,90	-	-
MPC (g/dL)	20,66	16,55 – 24,77	14,00 – 18,63	-	-
PCDW (g/dL)	5,35	3,53 – 7,17	4,58 – 7,05	-	-
MPM (pg)	1,97	1,57 – 2,37	1,32 – 1,92	-	-
PMDW (pg)	0,71	0,54 – 0,89	0,51 – 0,84	-	-

CONCLUSIONS

- It is not easy to collect from a database an adequate number of animals in order to establish hematological reference intervals since, after applying the selection criteria, the initial population is reduced drastically.
- Strict criteria applied in the selection of data for hematological reference intervals using a retrospective indirect sampling method, yields similar results to those obtained in other previous studies using direct method prospective data.
- Despite small differences in operating system based on laser beam on hematology analyzers currently available in the market, the results provided are similar and comparable. Small discrepancies may be due to the methodology used, the time elapsed from sample collection to analysis, the number of animals used or the presence of any outlier not excluded.

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