

HAEMATOLOGICAL CHANGES OF NIGERIAN INDIGENOUS DOGS AFTER 24 HOUR WATER DEPRIVATION AND RESTORATION

A. M. EHIMIYEIN, S. BALOGUN AND D. D. MAISHANU.

Department of Veterinary Medicine, Ahmadu Bello University, Zaria

Correspondence: ajokeeo@gmail.com

ABSTRACT

The aim of this study was to evaluate the effects of 24 h water deprivation and restoration on haematology parameters of dogs in confinement. A total of 10 Nigerian Indigenous dogs weighing 5-10 kg were used for the experiment. Blood samples were taken to evaluate complete blood count from the dogs after 24 h water deprivation and 24 h water restoration. The results obtained showed significant difference ($P < 0.05$) in the hematological parameters (MCV, HCT, MCHC, Lymphocytes and Granulocytes counts) during dehydration. The higher erythrocyte parameters obtained during deprivation showed that there was haemo-concentration which might lead to dehydration eventually over a long period of time. Water is essential in normal body function and metabolism, therefore it should be given to dogs without restriction.

Keywords: Dog, water deprivation, haematology.

INTRODUCTION

Dog is an intelligent, loyal and affectionate friend of man and it is man's best pet (Lubbock *et al.*, 1889). Initially classified as *Canis familiaris* or *Canis familiaris domesticus* (Linnaeus *et al.*, 1758), the Smithsonian Institution and American Association of Mammalogy re-classified the dog's scientific name as *Canis familiaris lupus*, to reflect its close relationship with the wolf (*Canis lupus*). The dog performs a wide range of functions beneficial to man and the society at large (Savolainen, 2002). They serve as companions, pets, guard dogs, food, hunting, for research, as well as for commercial purposes (Savolainen *et al.*, 2002), they are also used in search, rescue and recovery missions (Fenton, 1992). The complete blood count (CBC), is the most common blood test performed on pets and people (Smith, 2000). A CBC gives information on status, anemia, hydration, infection, blood's clotting ability, and the immune status. This test is essential for pets with fever, vomiting, diarrhea, weakness, pale gums, or loss of appetite (Fowler and Miller, 2003).

MATERIALS AND METHODS

This study was carried out using a total of 10 Nigerian indigenous male dogs. They were confined at the animal house of the Department of Veterinary Parasitology and Entomology,

Faculty of Veterinary Medicine, Ahmadu Bello University, Zaria situated on latitude 11° 12' N and longitude 07° 37' E, and at an altitude of 550-700 metres above the sea level.

EXPERIMENTAL PROTOCOL

Water was withdrawn from the dogs for 24 h after which blood was obtained in EDTA using 21G needle and syringes, and analysed. Twenty-four hours later, water was restored and a second blood samples were obtained. Blood samples were analysed using automated haematology analyser (Abbot Diagnostic division, Mountain View, CA) for complete blood count.

RESULTS AND DISCUSSION

The study showed significant variations in red cell count, (PCV), mean corpuscular volume (MCV), packed cell volume, haemoglobin concentration, white blood cells between dogs in groups A (after 24 h water deprivation) and B (after 24 h water restoration). There was a decrease in these parameters after 24 h water restoration. However, mean corpuscular haemoglobin (MCH), mean corpuscular haemoglobin concentration (MCHC), and granulocytes increased after water restoration. The higher erythrocyte parameters obtained during the deprivation showed that there was

haemo-concentration which might eventually lead to dehydration over a long period of time.

CONCLUSION

The result showed that water deprivation of 24 h might affect the erythrocyte parameters of dogs. Water is essential for the normal body function and metabolism and it is therefore recommended that it should be given without restriction to dogs.

REFERENCES

- Fenton, V. (1992). The use of dogs in search, rescue and recovery. *Journal of Wilderness Medicine*, 3: 292-300.
- Fowler, M.E. and Miller, R.E. (2003). *Zoo and Wild Animal Medicine*. 5th ed. St. Louis Sanders, Pp. 485-486.
- Linnaeus, C. (1758). *Systema bature per regna tria nature*, Secundub classes, ordines, genera, species, cum characteribus, diffentis synonym loco. (In Latin), 10th ed. Holmiae (Stockholm). *Laurentius Salvius*, Pp 39-40.
- Lubbock, S.J. (1884). Teaching animals to converse. *Nature*, 29(754): 216. doi. 10.1038/102921690.
- Savolainen, P., Zhang, Y.P., Luo, J., Lundeberg, J. and Leitner, T. (2002). Genetic evidence for an East Asian origin of domestic dogs. *Science*, 298(5598): 1610-1613.
- Smith, S.A. (2000). Specific species appropriate haematology, In: Feldman B.F., Zinkl, J.G., Jain, N.C., eds. *Schalm's Veterinary Haematology*, 5th ed. Baltimore, MD, Lippincott Williams & Wilkins, 1055-1224.

Table 1: Mean and standard error mean of haematological parameters after 24 H water deprivation and restoration in Nigerian indigenous dogs

PARAMETER	A (n=10)	B n=10
RBC	6.44 ± 0.19 ^a	6.16 ± 0.15 ^a
MCV	67.78 ± 0.79 ^{b*}	63.38 ± 0.96 ^a
PCV	43.64 ± 1.25 ^{b*}	39.09 ± 1.17 ^a
HB	14.18 ± 0.42 ^a	13.72 ± 0.36 ^a
WBC	15.65 ± 1.94 ^a	13.78 ± 1.47 ^a
MCH	22.05 ± 0.28 ^a	22.44 ± 0.27 ^a
MCHC	32.54 ± 0.35 ^a	35.16 ± 0.36 ^{b*}
LYMP	12.27 ± 1.64 ^{b*}	8.09 ± 0.76 ^a
GRAN	1.22 ± 0.16 ^a	2.10 ± 0.39 ^{b*}

Group A= after 24 H water deprivation. Group B = after 24 H water restoration
Values with different superscript alphabets, are significantly (P<0.05) different. * indicating significant differences in Means. SEM= Standard Error Mean.