Trop. J. Anim. Sci. 1 (2): 181-185 (1999)
ISSN: 1119-4308

THE EFFECTS OF XYLAZINE SEDATION ON SOME HAEMATOLOGICAL PARAMETERS OF THE WEST AFRICAN DWARF GOAT

A.K.OLAIFA[1], E.O. AWE, S.K. ONWUKA, A. ARIYIBI AND S.O. ONI
Faculty of Veterinary Medicine University of Ibadan
Ibadan, Nigeria

Target Audience: Livestock farmers and animal health care providers

ABSTRACT

Changes in selected haematological parameters as a result of xylazine sedation were studied in 6 West African Dwarf goats for 48 hours. There were significant reductions ($P < 0.05$) in the values of the packed cell volume (PCV), haemoglobin concentration (Hb) and red blood cell count (RBC) from their pre-sedation levels. On the other hand the white blood cell count (WBC) showed a significant increase in value ($P < 0.05$) as did also the mean corpuscular hae-moglobin (MCH) and the mean corpuscular volume (MCV). Remaining statistically unchanged was the mean corpuscular haemoglobin concentration (MCHC).

These findings are discussed with particular reference to their implications in possible surgical manoeuvres in the West African Dwarf goat that may necessitate sedation with xylazine.

Key words: Xylazine Sedation, Haematology, West African Dwarf Goat (WAD)

DESCRIPTION OF PROBLEM

To boost the contribution of the Livestock sector to the Agricultural output of Nigeria, multifaceted efforts are now in top gear to renew the interest and morale of people in livestock farming. For instance, the International Livestock Research Institute based in Addis Ababa has devoted much of its projects in the country towards this end and many Research Institutes and University Departments also have research projects with similar objectives.

In the Southwest part of the country this effort is concentrated mainly on indigenous small ruminant breeds of sheep and goats - the West African Dwarfs (WAD). For instance, there is a programme of upgrading the qualities

[1]Author for correspondence

of the West African Dwarf goat with those of the Borno White goat by cross-breeding (2). Williamson and Payne (3) had earlier referred to the enormous potential for increased goat production in this area.

All these efforts often, no doubt involve situations such as in dystocia, where surgical interference becomes the course of choice. Xylazine hydrochloride (Rompun, Bayer VA 1470, Bayer Laverkunsen Germany) is a potent analgesic and muscle relaxant that has been used for many years in veterinary practice (4). It is often used to immobilise and sedate dogs, goats, sheep and even horses (5,6). There has been a very extensive but indiscriminate use of it in Nigeria and no attention whatsoever had hitherto been paid to any adverse effects it might have or the mechanism of producing such adverse effects. But it has been shown elsewhere (7, 8) that it does have some adverse effects, especially in cardiovascular physiology. This study was thus designed to probe the effects of the administration of Xylazine on some haematological parametrs of the West African Dwarf Goat (WADG).

MATERIALS AND METHODS

Six West African Dwarf Goats aged between 1 and 1½ years were used for this study. They weighed between 10 and 15kg. The goats were housed at the experimental goat unit of the Teaching and Research Farm of the University of Ibadan. They were fed a basal diet of cereal concentrate consisting of: .

Corn meal	-	20%
PKC	-	20%
Wheat offal	-	20%
Brewer's grain	-	37.8%
GNC	-	1.85%
Salt (NGU)	-	0.25%
Minovit Super	-	0.10%

This was supplemented with grass. Water was given *ad libitum*. All the animals were dewormed using a broad spectrum anti-helminthic agent (citarin L^R Bayer) at the rate of 1ml/5kg using the intra muscular route.

2% xylazine hydrochloride was used in this experiment at a dose rate of 0.3mg./kg body weight.

5ml of blood was collected from each animal using the jugular vein before drug administration and subsequently at 0.5h, 1.0h, 24h, and 48h post administration.

The blood was collected in bottles containing an anticoagulant (EDTA). Packed cell volume (PCV) was determined by the microchematocrit method (9) and haemoglobin concentration (Hb) by the cyanomethemglobin method (10, 11).

Red blood cell (BC) and white blood cell (WBC) values were both determined using the Neubauer haemocytometer (10).

The mean corpuscular hemoglobin (MCH), mean corpuscular hemoglobin concentration (MCHC) and mean corpuscular volume (MCV) values were calculated from the values of PCV, REC and Hb.

RESULTS AND DISCUSSION

In Table 1, all the parameters measured with the exception of mean corpuscular hemoglobin concentration (MCHC), showed significant ($P < 0.05$) changes following xylazine administration. But while such parameters as the RBC count, and Hb showed significant ($P < 0.05$) decreases from their pre-injection values, others such as the WBC count, MCV and MCH showed significant ($P < 0.05$) increases. All the values had, however, returned to pre-injection levels by 48h post injection when the observations were terminated. Only the value of the mean corpuscular haemoglobin concentration (MCHC), which gives the average percentage of the MCV which hemoglobin occupies, remained statistically unchanged throughout the experimental period.

Table 1: Mean Values of Hematological pre-and -post-Drug Injection

Parameters	Pre-Injection	Post Injection			
		30 minutes	60 minutes	24 hours	28 hours
PC(V%)	24.00± 0.32^{a}	17.40± 0.68^{b}	21.60 ±0.87^{ab}	22.4 ± 0.87^{a}	22.60 ± 93^{a}
Hb(g/dl)	8.64 ± 0.12^{a}	6.62 ± 0.26^{b}	8.02 ± 0.33^{a}	8.60 ± 0.53^{a}	8.70 ± 0.49^{a}
RBC(x10^{6}dl)	12.90± 0.31^{a}	8.56 ±0.22^{c}	10.98 ± 0.29^{b}	11.10± 0.18^{ab}	11.42 ± 40^{a}
WBC(x10^{3}dl)	12.90± 1.39^{b}	16.45± 0.85^{a}	15.13 ± 0.27^{a}	12.64± 0.36^{b}	13.06 ± 0.10^{ab}
MCV (ml)	18.66± 0.58^{b}	20.30± 0.41^{a}	19.68 ± 0.24^{ab}	20.16± 0.27^{a}	19.80 ± 0.50^{ab}
MCH (pg)	6.70± 0.23^{b}	7.72 ± 0.25^{a}	7.32 ± 0.19^{ab}	7.72 ± 0.29^{a}	7.6 0.± 21^{a}
MCHl(g/dl)	34.02± 0.21	38.06± 0.92	37.12 ± 0.60	38.30± 1.12	38.42 ± 0.1

ans ± SEM

Means with different superscripts on the same row are significantly ($P < 0.05$) different.

The decreases in the values of the RBC count, PCV and Hb 30 minutes after the administration of xylazine were not surprising. They were in accord with the observation (12) that xylazine produced severe cardiovascular effects, causing vasoconstriction by stimulating alpha I agonists. If, as Campbell *et al* (13) also observed, this was accompanied by an increase in peripheral resistance to blood flow, relatively less blood would have been left in peripheral circulation, resulting in a measurable drop in value of hematological parameters. Blood could also be pooled and sequestered in such body organs as the spleen, a phenomenon usually associated with anaesthetic agents (14). Excitement, occasioning the release of epinepherine is also said to affect haemodynamics in a similar mannar (15).

The fall in RBC and related parameters was also reported in buffaloes following xylazine administration (16). However, this group in the buffalo studies also observed decreased WBC count in contrast to the significant

increase obtained in this study. Sharif and his colleagues (16) attributed the decrease in WBC value to margination of neutrophils. The reason for the increase here is unknown but there could probably be a factor that favours the exit of red blood cells from peripheral blood more quickly than white blood cells.

It could also be due to an immediate defensive mechanism against a xenogenous material. But although this calls for further investigation, it is to be remembered that the reaction faded back to normal levels before the conclusion of the study 48h later.

The implications of the findings of this study to small ruminant - practitioners are obvious. The time immediately following the administration of xylazine either as sedative or immobilizer in small ruminants is very critical. The drug pre-disposes to a sharp drop in haematologically important parameters and extreme caution should be taken not to exacerbate this effect by occasioning excessive loss of blood.

CONCLUSIONS AND APPLICATIONS

1 It has been shown from this study that the sedative drug xylazine causes a reduction in some blood values of the goat. This could also be the case in sheep

2. It will therefore be very advisable for livestock farmers and animal health providers to be very careful when using it.

REFERENCES

1. ILCA 1985 Sheep and Goat in Humid West Africa. ILCA Addıs Ababa Ethiopia.
2. Akinwole, A.J., Onwuka, S.K. and Ngere L.O. 1998. Comparative Evaluation of physiological indicators of adaptation in the Borno White and West African Dwarf Goats in the humid zone of Nigeria. Trop. Vet. (in press).
3. Williamson, G. and Payne W.J.A. 1984. An introduction to Animal Husbandry in the Tropics 3rd ed. Longman Group Ltd. Essex, England.
4. Hall, L.W. and Clarke K.W. (ed) 1983. Veterinary Anaesthesia ed 8, East Bourne England. Balliere Tindall.
5. Ewing, K.K. 1990. Anaesthesia technique in sheep and goats. Vet. Clin. 6: 759-778.
6. Kroneberg. A. Oberdorf, A., Hoffmeister. F. and Wirth N. 1967. Neuryn -Schinledgergs Arch Phars. Exp Path Pharmak 256:44.
7. Mc Cashin F.B. and Gabel A.A: 1975 Evaluation of xylaszine as a sedative and preanaesthetic agent in horses. Am. J. Vet. Res. 36: 1421-1429.

8. Muir W.M. Piper F.S. 1975. Effect of xylazine as a sedative and preamaeshetic agent in horses. Ame J. Vet Res 36:1421-1429.
9. Jain, N.C. 1986. Schalm's Veterinary hematology, 4th ed. Lea and Febiger PHiladephia.
10. Schalm O.W., Jain N.C. and Carrol E.J. 1975 Vet Hematology 3rd ed Philadephia U.S.A.
11. Kelly, W.R. 1979. Veterinary Clinical diagnosis 4th ed Publ. Balliers and Tindal London.
12. Robin B.C. 1991. Tranquilizers and Sedatives In: Principles and Practice of Veterinary Anaesthesia pg 23 Williams and Wilkins Balti-more.
13. Swenson M.J. 1981. Dukes Physiology of Domestic Animals 8th Edition Cornell University Press. Ithaca and London.
14. Bush B.M. 1993. Interpretation of Laborary results of small animal clinicains 2nd ed. Blackwell scientific Publications Inc.
15. Swenson M.J. 1981. Dukes Physiology of Domestic Animals 8th Edition Coirnell University Press. Ithaca and London.
6. Sharif M. Chaudry N.T. Newoz M. Duran, M.S 1991. Xylazine as a sedative and general anaesthetic in buffaloes. Pakistani Vet. J. 11: 4, 182-186.