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Leucocyte Variation During Human Menopausal Gonadotrophin (Pergonal®) and Prostaglandin Treatment in West African Dwarf Goats

[1]A.H. Abu, [2]F.C. Iheukwumere, [2]E.C. Ndubisi and [2]U.N. Egu
[1]Department of Physiology and Pharmacology, College of Veterinary Medicine,
University of Agriculture, PMB 2373, Makurdi, Benue State, Nigeria
[2]Department of Agriculture, Abia State University PMB 7010, Umuahia, Abia State, Nigeria

Abstract: A total of 24 matured, parous, clinically sound West African dwarf goats aged 3-5 years were used to study the effect of human menopausal gonadotrophin (Pergonal®) and prostaglandin on leucocyte variations. The goats were divided into three groups of eight goats in each group identified as T_1 (Control), T_2 human menopausal gonadotrophin treated goats, T_3 prostaglandin treated goats. The results show that total leucocyte count consistently increased from pre-treatment to 48 h post-oestrus in HMG-treated goats. There was no significant difference ($p>0.05$) in Dinoprost tromethiamine induced and natural oestrus. Neutrophil percentage was more during superovulatory oestrus followed by pre-treatment value. However, lymphocyte value was high during 48 h. Superovulatory oestrus, whereas in Dinoprost treated groups neutrophil was more during pre-treatment, but the difference was not significant ($p>0.05$) between treatment groups. The monocyte, eosinophil and basophil values were similar ($p>0.05$). The results of this study, indicate that HMG and prostaglandin treatments were not detrimental to the leucocyte count of goats.

Key words: Human menopausal gonadotrophin, prostaglandin, leucocyte, goats

INTRODUCTION

The primary goal of superovulation is to obtain consistent high number of viable good quality embryos from each donor (Nowshari *et al*., 1995; Senthilkumar *et al*., 1998). Superovulation involves the use of Follicle Stimulating Hormone (FSH), Follicle Stimulating Hormone+Luteinizing Hormone (FSH+LH); Pregnant Mare Serum Gonadotrophin (PMSG) and synthetic prostaglandin e.g., cloprostenol (Pereira *et al*., 1998; Zaimfirescu *et al*., 2000).

Pergonal® (formerly of Serono, Italy, now of Ferring Labs, USA) also known as Human Menopausal Gonadotrophin (HMG_ and with similar constituents as Pluset®, is a gonadotrophin preparation lyophilized in vials containing a mixture of gonadotrophin consisting of Follicle Stimulating Hormone (FSH) and Luteinizing Hormone (LH) in a ratio 1:1 (Dixon and Hopkins, 1996). LH and FSH present in Pergonal play vital role in the initiation of multiple ovulations in animal (Lauria *et al*., 1982; Sugano *et al*., 2001 and Iheukwumere, 2004).

Normal blood parameters of West African dwarf goats have been reported by Aba-Adulugba and Joshua (1990) and Iheukwumere *et al*. (2004), but the leucocyte variations during superovulation have not been studied so far. It has not been determined if the administration of the hormone preparations for superovulation would induce any side effects on the leucocyte parameters of treated animals.

This study was carried out to study the effects of Human Menopausal Gonadotrophin and Prostaglandin treatments on leucocyte variation in West African dwarf goats.

MATERIALS AND METHODS

A total of 24 West African dwarf goats, aged 3-5 years and in 6-12th day of oestrus cycle, were divided into three groups identified as T_1 control administered with 1 ml physiological saline, T_2 administered with 19;0 mg Human menopausal gonadotrophin for superovulation and T_2 administered with 7.5 mg prostaglandin to synchronize oestrus (Dinoprost tromethiamine). The HMG was given for 4 days (12 h interval) and prostaglandin was given 60 h after the start of HMG treatment. The goats were maintained under standard feeding, housing and management practices.

Corresponding Author: A.H. Abu, Department of Physiology and Pharmacology, College of Veterinary Medicine, University of Agriculture, PMB 2373, Makurdi, Benue State, Nigeria

Table 1: Leucocyte count during dinoprost tromethamine induced and natural oestrus of West African dwarf goats

Parameters	n	Oestrus expression (h)	TLC	N	L	M	E	B
Before treatment	8	51.62±2.45	10,150.25	57.68	31.85	1.03	5.35	-
			±610.15	±2.12	±2.21	±0.17	±0.14	
Induced oestrus	8		10,350.35	56.65	31.14	0.75	3.56	
			±520.85	±1.53	±1.40	±0.14	±0.03	-
Natural oestrus	8		11,185.25	33.62	33.24	1.75	3.09	0.81
			±1,214.75	±2.26	±2.20	±0.30	±0.72	±0.16

TLC = Total Leucocyte Count, N = Neutrophil, L = Lymphocyte, M = Monocyte, E = Eosinophil, B = Basophil

Table 2: Leucocyte count during superovulatory oestrus and post oestrus of West African dwarf goats

Parameters	N	TLC (thousand)	N	L	M	E	B
Pretreatment	8	10,204.76	54.35	36.32	1.35	0.15	1.60
		±540.33	+2.35	±2.12	±0.30	±0.03	±0.15
Superovulators	8	10,520.21	55.83	35.45	2.40	2.11	0.12
Oestrus		+580.75	±0.21	±3.01	±0.38	±0.32	±0.04
48-h post oestrus	8	11,245.30	52.35	41.75	2.64	3.04	0.12
		±985.48	±3.75	±3.95	±0.50	±0.42	0.06

TLC = Total Leucocyte Count, N = Neutrophil. L = Lymphocyte, HA = Monocyte, E = Eosinophil, B = Basophil

Prior to treatment blood was collected in EDTA bottles and subsequently during superovulation, prostaglandin induced and natural (control) oestrus and 48 h post-superovulatory oestrus. Slides were prepared, fixed in methanol and stained with Haematoxylin and Eosin (H and E). Total Leucocyte Count (TLC) and Differential Leucocyte Count (DLC) were made following standard procedure as described by Jain (1985). All the data collected from this study were subjected to analysis of variance procedure Steel and Torrie (1980).

RESULTS AND DISCUSSION

The mean interval to oestrus expression was 51.62±2.45 h with a range of 42.10-72 h (Table 1). Akusu and Egbunike (1990) and Kurina *et al.* (2000) reported better responses than those observed in this study. However, Iheukwumere (2004) and Molokwu and Igono (1982) observed higher interval to oestrus expression in West African dwarf goats and Nigerian savannah Brown goats using different chemical treatments. All the Dinoprost tromethiamine treated goats expressed typical standing oestrus similar to those reported by Mahmood *et al.* (1994), Akusu and Egbunike (1990) and Kurina *et al.* (2000), but Molokwu and Igono (1982) reported sniffing without mounting attempt by bucks.

The total leucocyte count consistently increased from pre-treatment to 48 h post oestrus state in HMG-treated goats (Table 2). There was no significant difference ($p>0.05$) in Dinoprost tromethamine induced and natural oestrus (Table 1). Iheukwumere *et al.* (2004) and Aba-Adulugba and Joshua (1990) reported higher leucocyte counts in goats.

This could possibly be due to difference in physiological status of goats (Iheukwumere *et al.*, 2004).

Neutrophil percentage was more during superovulatory oestrus followed by pretreatment value. However, lymphocyte value was high during 48 h post-superovulatory oestrus whereas in Dinoprost treated groups neutrophil was more during pretreatment compared to induced oestrus, but the differences were not statistically ($p>0.05$) different (Table 2). Also, there were little fluctuations in monocyte, eosinophil and basophil values in HMG and Dinoprost treated goats. Iheukwumere *et al.* (2004), Aba-Adulugba and Joshua (1990) and Lazzaro (2003) reported similar observation in West African dwarf goats.

The results of this study, indicate that HMG and Dinoprost tromethiamine did not affect leucocyte parameters in West African dwarf goats.

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