

Short communication

Responses of Abyssinian Jennies to Treatments with Prostaglandin F₂ alpha

Getachew Tadesse¹

¹Department of Biomedical Sciences, College of Veterinary Medicine and Agriculture, Addis Ababa University, P.O.Box 34, Debre Zeit, Ethiopia, getadesse1@yahoo.com

Abstract

The objectives of this study were to assess the heat induction and side effects of PGF₂ in Abyssinian type jennies. Twenty jennies were used in the study. PGF₂ was administered twice at doses of 44.µg/Kg and 22 µg/Kg body weight, 10 to 20 days apart. Observations on clinical and behavioral abnormalities were done before and after drug administration. Heat detection was assisted by a jackass. All jennies were ataxic and depressed after administration of PGF₂. No apparent differences were observed in the magnitude of the side effects at both dose levels and jennies were in heat (18/20) post drug administration. PGF₂ at 22 µg / Kg body weight could safely be used to induce heat and synchronize estrus in Abyssinian jennies.

Key words: Heat induction, Jennies, Prostaglandin, Side effects

Introduction

Prostaglandin F₂ and its analogues have been used to induce estrus and terminate pregnancy and in the management of reproductive disorders in domestic animals (Mitchell *et al.*, 1976; Howey *et al.*, 1983; Weems *et al.*, 2006; Squires, 2008). The side effects vary by the type of prostaglandin, the dose level, the dosage regimen and the species. In mares PGF₂ causes transient side effects (locomotor disturbances, respiratory distress, tachycardia and sweating) at doses lower than 100 mg but the effects are profound at doses of 400 mg and above (Pharmacia and Upjohn Company, 2004). No side effect was recorded in a regimen of 0.5 mg PGF₂ given 24 hours apart compared to a 10 mg single dose (Irvine *et al.*, 2002). Sweating, increased respiration and defecation were reported after administration of fluprostenol at 250 -500 µg (Ousey *et al.*, 1984) and except swelling at the site of injection no side effect was recorded after administration of fenprostalene at a dose of 250 µg (Bosu *et al.*, 1983). Cloprostenol at a dose of 0.075 mg was luteolytic with no side effects (Carluccio

et al., 2006). The objective of this study was to assess the heat induction and side effects of PGF₂ in Abyssinian type jennies.

Materials and Methods

Twenty apparently healthy Abyssinian type jennies (4 maiden and 16 parous) with unknown breeding status were used in the study. The average body weight of donkeys was estimated at 125 Kg. Each jenny received PGF₂ (dinoprost tromethamine, LUTALYSE ®, 5mg/ml sterile solution, Pharmacia and Upjohn Company, 2004) at two dose levels administered 10 to 20 days apart. The doses in the first and second treatments were 44 µg/Kg body weight (1.2 ml) and 22 µg/Kg body weight (0.6 ml) respectively. The drug was administered by injection (IM) at the neck muscle. Two jennies that did not display heat after the first treatment received 1.2 ml of the solution in the second. Observations on clinical abnormalities and heat were done before and after drug administration. Heat detection was assisted by a vasectomized jackass. Two jackasses were used to breed nine jennies. The mating was on the 6th and 8th days after the second treatment with PGF₂ and within the last three days of heat in the subsequent cycles.

Results

All jennies were ataxic and depressed shortly after administration of the drug in both the first and second treatments. The side effects disappeared after an hour and jennies were grazing normally thereafter. Two jennies aborted after the first treatment (Table 1).

Table 1. Responses of jennies (n = 20) to PGF₂ at doses of 5.6 mg and 2.8 mg.

Responses	5.6 mg ^a	2.8 mg ^b
	Number	Number
Ataxic	20	18
Depressed	20	18
Metritic and pus discharged ^c	1	nd
Pregnant and aborted	2	nd
Pregnant but did not abort ^c	1	nd
Displayed heat	18	18

a= The number of Jennies that received 5.6 mg dinoprost was 20.

b = The number of jennies that received 2.8 mg dinoprost was 18.

c = The jennies received 5.6 mg dinoprost in the first and second part.

nd = Not done

Eighteen jennies displayed estrus in both the first and second treatment. Heat was induced 3.6 ± 1.6 days (mean \pm SD) post PGF₂ administration. All jennies bred to jack asses were pregnant and the average number of cycles per pregnancy was three.

Discussion

At the time of purchase the reproductive statuses of the jennies were unknown. However, as the management is extensive and breeding is uncontrolled, it is likely that a significant number of the animals might have conceived. Most Ethiopian donkeys breed during the short rainy season (Melaku Tefera, 2004) and increased ovarian activities and higher intensities of ovulations were recorded during the short rainy season (Alemayehu Lemma *et al.*, 2006).

The locomotor disturbances and depressive effects of the drug were short lived and there were no apparent differences in the magnitude of the side effects of the two dose levels. Increased respiratory and heart rates could also have occurred. However, the transient nature of the side effects and the absence of a detrimental effect at a dose twice the recommended luteolytic dose for mares indicate the wide safety margin of PGF₂ in donkeys.

Abortion was induced in two donkeys but one jenny was refractory to repeated injections. A single treatment with PGF₂ is recommended to induce abortion in mares less than 70 days pregnant but repeated administrations for three days in mares greater than 70 days of gestation (Upson, 1993). In addition a single dose was reported to have induced abortion in mares less than 150 days of gestation (Douglas *et al.*, 1974) and consecutive dosages were required in mid to late gestation mares (Douglas *et al.*, 1974; Van Leeuwen *et al.*, 1983). Single doses or double doses of prostalene did not induce abortion in mares 99 to 153 days of gestation (Bosu and Mckinnon, 1982) and parturition was not induced in late gestation mares (less than 320 days of pregnancy) after administration of fluprostenol (Ousey *et al.* 1984). As only three pregnant animals with unknown breeding dates were considered in this study, it is not possible to draw conclusions on the dosage regimen that induces abortion in jennies at different stages of gestation. However, based on reports on horse studies, administration of a single dose in early gestation and consecutive dosages in late gestation may induce abortion in donkeys.

Behavioral estrus was detected in 18 of the 20 jennies. This is in accord with other reports on mammoth asses (Blanchard *et al.*, 1999) and mares (Mitchell *et al.*, 1976). Although intramuscular administration of 0.6 ml PGF₂ (2.8 mg) is luteolytic in jennies, the effective dose could be lower.

Administration of PGF₂ did not appear to have a negative impact on the subsequent pregnancies. Normal conception and foaling rates were reported in mares treated with alfaprostal (Howey *et al.*, 1983) and mares treated with fenprostalene were pregnant in less than two cycles per pregnancy (Bosu *et al.* 1983). The relatively higher number of cycles per pregnancy could be because the mating was on assumed ovulation dates. Although ovulation may occur within the last two days of the cycle and mating could be successful if jennies are served in the last third of heat (Fielding, 1988), the appropriate mating time may differ between individuals and between different cycles of the same jenny. The number of cycles per pregnancy could have been lower, had the jackasses were allowed to run with the jennies or the services were on the basis of follicular growth or progesterone profiles of each jenny.

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