

Effect of Finasteride and Deslorelin Treatment on Clinical Signs, Prostatic Volume and Semen Quality in Dogs with Benign Prostatic Hypertrophy: A Clinical Trial

Chunsumon Limmanont^{1,2,3}, Janjira Phavaphutanon^{1,2,4} and Kaitkanoke Sirinarumitr^{1,2,3,4,*}

ABSTRACT

Benign prostatic hypertrophy (BPH) is a natural prostate disease in aging intact male dogs. Clinical signs of the disease include constipation and blood in the semen or blood in the urine concurrent with a prostatic cyst, prostatitis, prostatitis with an abscess and cystitis. Androgen, especially dihydrotestosterone, is the key hormone for disease development. The recommended treatment for BPH is castration; however, medical treatment is an alternative and necessary in some dogs with restrictive conditions. The objective of the study was to compare the effects of finasteride (5 α -reductase inhibitor), which is widely used for BPH treatment, and deslorelin (GnRH-agonist), which is a new alternative for BPH treatment. The study focused on clinical signs, the prostatic size and semen quality in both groups. Sixteen natural BPH, client-owned dogs were recruited and divided into two groups. Eight BPH dogs received 0.1–0.5 mg.kg⁻¹ finasteride, orally, once a day, for 16 wk, and the other eight dogs were treated with a single implant of 4.7 mg deslorelin that lasted for 24 wk. Each dog was evaluated at 0, 4, 8 and 16 wk of finasteride treatment and at 0, 4, 8, 16, and 24 wk of deslorelin treatment. Repeated analysis of variance measurement was used to compare the differences in both groups. The results revealed that both medications were effective to resolve clinical signs and decrease prostatic size. Finasteride had no effect on semen quality, except to decrease semen volume. An adverse effect of deslorelin treatment was anejaculation. In conclusion, both finasteride and deslorelin were able to treat BPH dogs. Finasteride is a suitable drug for stud breeding dogs; however, deslorelin is more suitable for dogs with anesthetic risk.

Keywords: benign prostatic hypertrophy (BPH), finasteride, deslorelin, dog

INTRODUCTION

Benign prostatic hypertrophy (BPH) is a common and spontaneous prostatic disorder in

male dogs and also a common disease in aging men. Only dogs and humans can develop the disease. There is a high risk of BPH in old dogs, and it is usually found in at least 80% of the population of

¹ Center of Agricultural Biotechnology, Kasetsart University, Kamphaeng Sean Campus, Nakhon Pathom 73140, Thailand.

² Center of Excellence on Agricultural Biotechnology, Science and Technology Postgraduate Education and Research Development Office, Commission on Higher Education, Ministry of Education. (AG-BIO/PERDO-CHE), Bangkok 10330, Thailand.

³ Faculty of Veterinary Medicine, Kasetsart University, Bangkok 10900, Thailand.

⁴ Center for Advanced Studies in Agriculture and Food, KU Institute for Advanced Studies, Kasetsart University, Bangkok 10900, Thailand (CASAF, NRU-KU, Thailand).

* Corresponding author, e-mail: fvetkns@ku.ac.th, fvetkns@yahoo.com.

intact male dogs over 5 years old. BPH develops from changes in the ratios of increasing prostatic cell growth compared to prostatic cell death. There are many factors that can initiate BPH and its development such as dihydrotestosterone (DHT), testosterone (T), intraprostatic estrogen and growth factors. However, DHT which is converted from T by the prostatic enzyme, type II of 5-alpha reductase, is considered the main cause of prostate gland enlargement (Sirinarumitr *et al.*, 2001; Memon, 2007). Dogs with BPH are usually predisposed to developing prostatic cysts, prostatitis, prostatitis with an abscess and cystitis. Clinical signs related to the disease include constipation, blood dripping from the penis, blood-contaminated semen (hematospermia) and blood in the urine (hematuria) (Sirinarumitr *et al.*, 2001; Memon, 2007), or clinical signs of urinary incontinence or both.

Disease diagnosis is based on the clinical history, clinical signs, the prostatic contour through rectal palpation, prostatic size detected by radiography, prostatic volume and parenchyma detected by ultrasonography, semen culture and cytology. Digital rectal palpation finds a symmetric, painless and large prostate gland. An asymmetric gland may be detected in some BPH dogs with prostatic cysts or abscesses. Abdominal radiography reveals prostatomegaly (Memon, 2007). The prostatic diameter is usually greater than 70% when it is compared to the pubis-sacral promontory distance (Feeney *et al.*, 1987). Ultrasonography reveals a large prostate gland with homogeneous echogenicity of prostatic parenchyma, and it is possible to find small and fluid-filled cysts in some BPH with prostatic cysts (Sirinarumitr *et al.*, 2001). The prostatic size is measured in centimeters by transabdominal ultrasonography and converted to the prostatic volume using the formula in Equation 1:

$$\text{Volume} = (1/2.6 \times L \times W \times D) + 1.8(1)$$

where the volume is measured in milliliters and L, W and D are measured in centimeters and are the greatest craniocaudal

length, transverse width and dorsoventral depth, respectively (Kamolpatana *et al.*, 2000; Nyland and Mattoon, 2002). The normal prostatic volume for a dog under 20 kg is not over 10 mL (Sirinarumitr *et al.*, 2001). Prostatic fluid obtained by ejaculation or prostatic massage is clear or hemorrhagic. Semen bacterial culture reveals less than 1×10^4 colony forming units (CFU).mL⁻¹ (Sirinarumitr *et al.*, 2001). Inflammatory cells should not be found in semen cytology sediment.

The recommended permanent treatment for dogs with BPH is castration (Johnston *et al.*, 2001 and Memon, 2007), where T and DHT are no longer available for prostate gland enlargement (Sirinarumitr *et al.*, 2001). However, medical treatment should be considered where valuable stud breeding dogs or dogs with high risk in anesthesia are involved, or in BPH dogs with prostatitis with an abscess (Sirinarumitr *et al.*, 2001). Previous medical treatments for BPH included using diethylstilbestrol and medroxyprogesterone though these have been reported to have some adverse effects (Donald and Phar, 2008). Diethylstilbestrol may cause anemia, thrombocytopenia, pancytopenia and squamous metaplasia of the prostate gland resulting in ductal obstruction and cystic formation (Donald and Phar, 2008). Hypothyroidism and diabetes mellitus have been reported in some dogs treated with medroxyprogesterone (Donald and Phar, 2008). With these adverse effects, both medications have not been widely used for BPH treatment.

Finasteride, a type II 5-alpha reductase inhibitor, has been widely successful for treating dogs with BPH. The disadvantages of finasteride are its expense, the need for daily administration and the fact that it produces only a temporary decrease in prostatic size. Moreover, type II 5-alpha reductase inhibitors may cause abnormalities of the external genitalia of a male fetus (Donald and Phar, 2008), so it should be used with extreme caution where there is chance that pregnant women may be contaminated from absorption during the administering of finasteride to a dog with BPH

(Donald and Phar, 2008).

Deslorelin, GnRH agonist affects gonadotropin-producing cells of the anterior pituitary gland and reversibly blocks production and release of the follicle stimulating hormone (FSH) and luteinizing hormone (LH) (Richler *et al.*, 2003; Trigg *et al.*, 2006). Deslorelin has been used for treatments in fertility control, behavioral-related sex hormone control (Trigg *et al.*, 2006), urinary incontinence (Richler *et al.*, 2003) and estrus control in dogs. Although, there have been a number of deslorelin experiments in dogs (Fontaine and Fontbonne, 2011), there have been no reports of any clinical trials using deslorelin to treat dogs with natural BPH. Deslorelin has been determined to treat BPH due to its action in decreasing FSH and LH, followed by decreasing T and DHT and causing prostate gland shrinkage (Fontaine and Fontbonne, 2011).

The objective of the study was to use a clinical trial to compare finasteride to deslorelin as a natural BPH treatment in dogs.

MATERIALS AND METHODS

Dog selection

Nineteen client-owned, intact, male dogs which were diagnosed with natural BPH were recruited for the study. The clinical signs included constipation, either blood-contaminated urine or semen, or urinary incontinence or both. All BPH dogs had an apparently normal blood count, blood urea nitrogen, creatinine, alanine transaminase and alkaline phosphatase. All dogs tested negative for canine brucellosis detected using a commercial brucella antibody test kit. The prostatic volume measured by ultrasonography was over 10 mL in the medium-breed dogs or squamous metaplasia cells were found from semen cytology. The semen bacterial cultures for aerobic bacteria yields were less than 10,000 CFU.mL⁻¹ and there were no inflammatory cells in the semen cytology.

Experimental design

The experiment was conducted as a clinical trial. All dog owners signed consent forms before enrolling their dogs in the study. Each dog with BPH was assigned to one of two treatment groups and received either finasteride (ProscarTM, 5 mg per tablet, Merck) 0.1–0.5 mg.kg⁻¹, orally, once a day for 16 wk (Sirinarumitr *et al.*, 2001) or was implanted with a single dose of 4.7 mg of deslorelin (SuprelorinTM; Peptech Animal Health Pty. Ltd.; Macquarie Park, NSW, Australia) as a subcutaneous injection between the base of the scapular area and was then observed for 24 wk. The treatment selection depended on what was convenient for the respective dog owners. Each dog with BPH was evaluated for clinical signs, prostatic volume, semen quality, semen bacterial culture and cytology at 0, 4, 8 and 16 wk of the finasteride treatment period, and at 0, 4, 8, 16, and 24 wk of the deslorelin treatment period.

Prostatic volume

Ultrasonography (HS-2000VET; Honda Electronics; Aichi, Japan; or LOGIQ P6; GE Healthcare; Chalfont St. Giles, UK) was used to measure the prostatic volume. Each dog was positioned in dorsal recumbency. After clipping the hair, an ultrasound transducer was located at the ventrocaudal part of abdomen. The prostate gland was measured for length, width, and depth at the greatest craniocaudal length, transverse width, and dorsoventral depth, respectively (Figure 1). The prostate volume was calculated using Equation 1. The ultrasonographic character of the prostatic parenchyma was recorded.

Semen collection and evaluation

Semen was manually collected using a female pheromone or a teaser bitch and an artificial vagina. The first two fractions of semen—pre-sperm and sperm rich—were collected in a 15 mL centrifugation tube attached to the artificial vagina. The last fraction (prostatic fluid) was separately

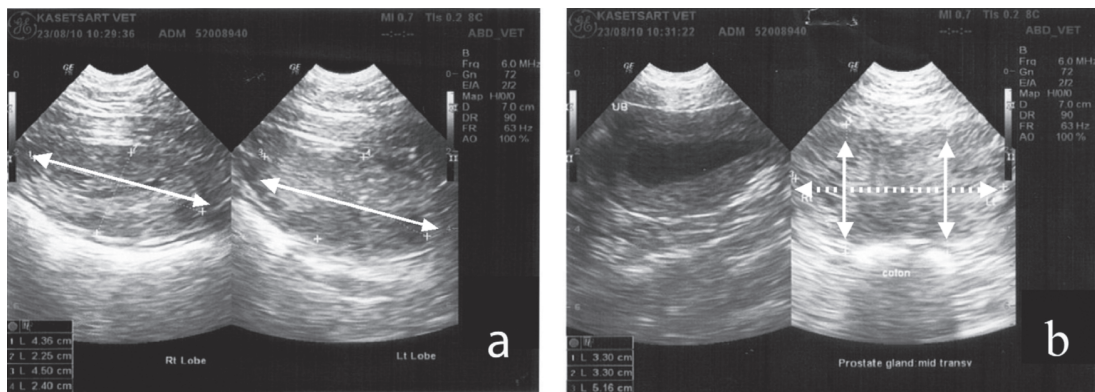


Figure 1 Prostatic size measurement by transabdominal ultrasonography: (a) a saggittal plane from the right (left hand side image) and left (right hand side image) lobes of the prostate gland for length measurement (solid arrows); and (b) a transverse plane of the prostate gland for width (dotted arrow) and depth measurements (solid arrow) for right (left hand side image) and left (right hand side image) lobes.

collected in a new tube. Semen evaluation was based on sperm motility, sperm morphology, semen concentration, total sperm number per ejaculation, the percentage of dead and live sperm and the total semen volume. Briefly, one drop of semen was dropped on a glass slide, and sperm motility was examined with a microscope at 400× magnification. One drop of semen was smeared on a glass slide and allowed to dry. Then, the slide was stained with a commercial Romanowsky stain variant (Diff Quick; Q Dip Stain Set, Life Science Dynamic Division, Arnapharn Co., Ltd. Nonthaburi, Thailand) and evaluated for the percentage of normal and abnormal sperm based on their morphology. Semen concentration was carried out by counting sperm in an aliquot of semen diluted 1:100 and using a hemacytometer (Sirinarumit *et al.*, 2001). A drop of each semen and an eosin-nigrosin stain were mixed and smeared on a glass slide and the percentage of dead and live sperm determined by counting. Semen bacterial culture and semen cytology were undertaken by the Kasetsart University Veterinary Diagnosis Centre, Bangkhaen campus, Bangkok.

Statistical analysis

Repeated ANOVA measurements and the Bonferroni multiple-comparison test were used to compare the differences in prostatic volume, total semen volume and total sperm per ejaculation in both groups. Differences were considered to be significant at the level of $P < 0.05$. The program NCSS 2007 was used for statistical analysis (Hintze, 2006).

RESULTS

Nineteen natural BPH dogs were recruited in the study. While 11 dogs were recruited in the finasteride treatment group, only 8 dogs completed the study period—one American Pit Bull Terrier and 7 crossbreeds. There were 8 dogs in the deslorelin implantation group—one Rottweiler, one Golden Retriever, one Bull Terrier, one Beagle and four crossbreeds. The average age and bodyweight of the dogs in each treatment group are shown in Table 1. There were no significant differences in age and bodyweight between the treatment groups.

Table 1 Age and bodyweight of dogs from each treatment group.

Treatment group	Age (yr)	Body weight (kg)
Finasteride	4.76 ± 1.97	21.55 ± 6.29
Deslorelin	6.48 ± 2.57	21.78 ± 8.58

Data shown as mean ± SD, n = 8.

Clinical signs

All dogs in the study were generally normal based on general observation physical examination throughout the treatment periods. In the finasteride treatment group, clinical signs related to BPH included constipation in one of the eight dogs (1/8) and blood-contaminated semen (3/8) as shown in Figure 2. All clinical signs were resolved within 4 wk of treatment, except for one dog where blood was found in the semen throughout the 16 wk of treatment. In the deslorelin implantation group, the only clinical sign related to BPH was blood in the semen (4/8) and it was resolved within 4 wk (2/4) and 8 wk

(2/4) of treatment period. There was no adverse skin reaction at the implantation site in any of the dogs during the 24 wk of treatment.

Prostatic volume

Before treatment, the mean (± SD) prostatic volumes were 12.64 ± 5.31 and 19.36 ± 11.97 mL in the finasteride and deslorelin treatment groups, respectively. The mean prostatic volumes during both treatment periods are shown in Figure 3.

In the dogs undergoing the finasteride treatment, there was no significant difference in the decrease in prostatic volume during the 16 wk of treatment. However, after 4 wk of treatment, the mean prostatic volume was under 10 mL which is normal for the prostate (Figure 3b). In the dogs undergoing the deslorelin treatment, there was a significant decrease in the prostatic volume at 16, and 24 wk compared to the volume before treatment (Figure 3a). There was no significant difference in prostatic volume between the finasteride and deslorelin groups during the 16 wk of treatment. Both medical treatments were effective in decreasing the prostatic volume during their treatment periods.

The percentage changes of prostatic volume with finasteride (at 4, 8 and 16 wk) and with deslorelin (at 4, 8, 16 and 24 wk) compared to the volumes before treatment are shown in Figure 4.

In the dogs treated with finasteride, compared to the before treatment volume, the prostatic volume decreased by 34.02 % after 4 wk of treatment and the maximum decrease of 55.88 % occurred after 8 wk of treatment. In the dogs treated with deslorelin, compared to the before treatment volume, the prostatic volume



Figure 2 Semen collected from dogs with benign prostatic hypertrophy: (a) Sperm-rich fraction (opaque color); (b-e) Prostatic fluid contaminated with blood, which is laid down as sediment in the bottom of each tube.

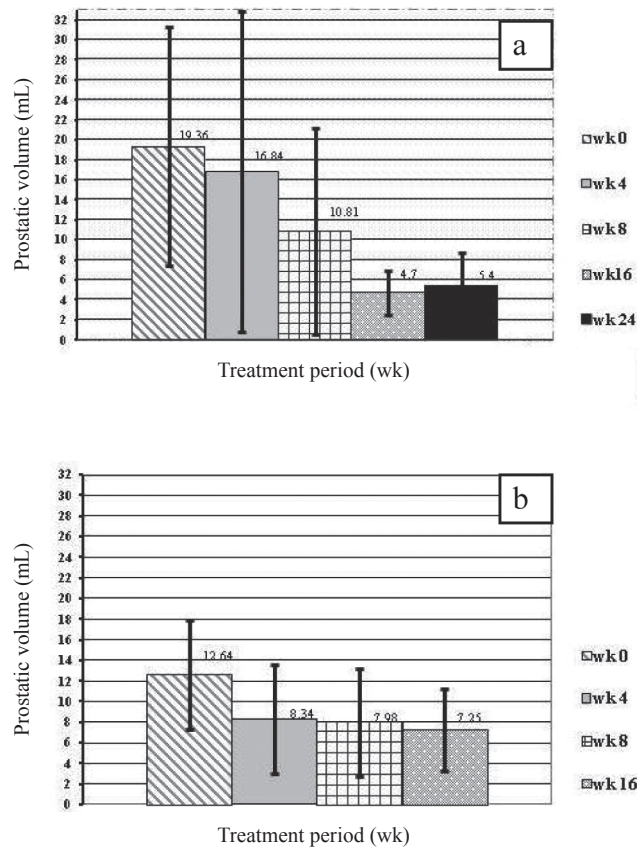


Figure 3 Mean prostatic volumes in dogs with benign prostatic hypertrophy: (a) Deslorelin treatment at 0, 4, 8, 16 and 24 wk of treatment; and (b) Finasteride treatment at 0, 4, 8 and 16 wk of treatment. Vertical bars show the SD for the means indicated by the values.

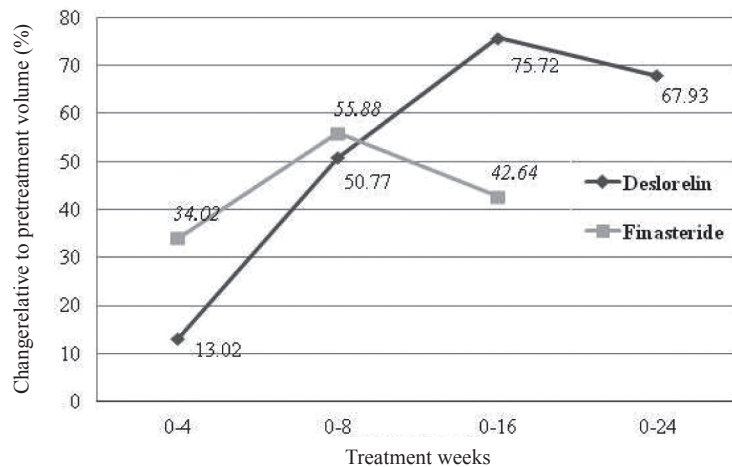


Figure 4 Change in prostatic volume for finasteride and deslorelin treatment groups compared to before treatment volume.

decreased by 13.02 % after 4 wk of treatment, by 50.77 % after 8 wk of treatment and achieved a maximum decrease of 75.72 % after 16 wk of treatment.

Semen quality

Semen quality consisted of the total semen volume (measured in milliliters), total sperm number (millions per ejaculation), the percentage of progressive motility, the percentage of normal morphology and the percentage of live sperm. The semen quality results for the finasteride and deslorelin treatments are shown in Tables 2 and 3.

In dogs undergoing the finasteride treatment, there was a significant decrease in the semen volume at 4, 8, and 16 wk compared to the before treatment volume. However, there were no significant differences in the mean total

sperm number per ejaculation, the percentage of progressive motility, the percentage of normal morphology and the percentage of live sperm during the treatment period (Table 2).

In dogs undergoing the deslorelin treatment, there were significant decreases in the semen volume and the mean total sperm number per ejaculation, while there were highly significant differences ($P < 0.0001$) in the percentage of progressive motility, the percentage of normal morphology and the percentage of live sperm at 16 and 24 wk of treatment period compared to before treatment. Anejaculation was found in all dogs treated with deslorelin at 16 and 24 wk of treatment (Table 3).

Semen culture and cytology

The results of semen bacterial culture from dogs undergoing both treatments of benign

Table 2 Results of semen evaluations from dogs with benign prostatic hypertrophy during 16 wk of finasteride treatment.

Weeks of finasteride treatment	Semen volume (mL)	Total sperm number per ejaculation ($\times 10^6$)	Progressive motility (%)	Normal morphology (%)	Live sperm (%)
0	12.03 \pm 5.56 ^a	229.09 \pm 255.78	62.86 \pm 14.10	74.36 \pm 21.11	95.30 \pm 6.58
4	4.26 \pm 3.03 ^b	327.40 \pm 246.03	77.14 \pm 21.38	79.00 \pm 18.96	95.20 \pm 8.14
8	3.76 \pm 2.71 ^b	288.89 \pm 185.60	78.13 \pm 25.00	75.08 \pm 22.58	98.80 \pm 1.39
16	5.76 \pm 3.06 ^b	410.74 \pm 274.24	81.25 \pm 8.35	75.69 \pm 16.00	93.69 \pm 5.02

Data shown as mean \pm SD, n = 8. Values with different letter superscripts (^{a, b}) within the same column are significantly different ($P < 0.05$).

Table 3 Results of semen evaluations from dogs with benign prostatic hypertrophy in 24 wk of deslorelin treatment.

Weeks of deslorelin treatment	Semen volume (mL)	Total sperm number per ejaculation ($\times 10^6$)	Progressive Motility (%)	Normal morphology (%)	Live sperm (%)
0	8.23 \pm 5.62 ^a	230.63 \pm 263.85 ^a	73.57 \pm 24.28 ^a	74.35 \pm 13.51 ^a	93.64 \pm 11.40 ^a
4	6.58 \pm 12.26 ^a	162.70 \pm 161.73 ^a	67.14 \pm 23.07 ^a	68.60 \pm 10.25 ^a	86.40 \pm 15.30 ^a
8	0.44 \pm 0.66 ^a	74.23 \pm 128.62 ^a	70.00 \pm 26.46 ^a	59.23 \pm 11.52 ^a	94.00 \pm 6.10 ^a
16	N/A ^b	N/A ^b	N/A ^b	N/A ^b	N/A ^b
24	N/A ^b	N/A ^b	N/A ^b	N/A ^b	N/A ^b

Data shown as mean \pm SD, n=8. Values with different letter superscripts (^{a, b}) within the same column were significantly different ($P < 0.05$). N/A = No data were available in weeks 16 and 24 of the deslorelin treatment because all dogs had anejaculation.

prostatic hypertrophy are shown in Table 4. Sample images of semen cytology from both treatments are shown in Figures 5 and 6.

Most of the semen aerobic bacterial cultures observed in dogs from both treatments resulted in no growth. Some semen samples from dogs treated with finasteride were positive for bacterial culture, but there were less than 1,000 CFU.mL⁻¹ after treatment (day 0, 1/7; 4 wk, 2/6; 8 wk, 2/7; and 16 wk, 3/7). There was one dog in the deslorelin implantation group where semen culture was found at a level of 2.21×10^5 CFU.mL⁻¹ *Klebsiella* spp. at 8 wk of treatment. At 4, 8 and 16 wk in the dogs with deslorelin implantation, there was anejaculation in most dogs, so no samples were submitted for seminal culture or cytology testing. The cytology of semen from both treatments contained no neoplasial cells for the whole period of treatment.

DISCUSSION

Normally, one of the clinical signs of BPH in dogs is blood in the semen; however, this sign is also consistent with other diseases such as coagulopathy, a blood parasite infection or other prostatic disorders (Memon, 2007). There was one dog that still had blood in its semen throughout the 16 wk of its finasteride treatment. Besides the red blood cells, there were no bacteria and inflammatory cell in its semen. The dog received finasteride at the dosage of 0.17 mg.kg⁻¹ (1 tablet per 29 kg weight of the dog). Finasteride at 0.1

mg.kg⁻¹, orally, once a day for 16 wk was reported to reduce prostatic volume, resolved clinical signs, reduced DHT concentration and to have no effect on semen quality, fertility or libido in a group of nine dogs with BPH (Sirinarumitr *et al.*, 2001). For this dog, blood in the semen may have been resolved if the dosage of finasteride had been increased to 0.5–5 mg.kg⁻¹ (Rhodes, 1996; Memon, 2007). However, it was not necessary to use a higher dosage, as the red blood cells in the semen had no effect on semen quality, and the prostatic volume decreased to normal size. Finasteride is an expensive drug, so that if the higher dosage were to be prescribed, then the treatment cost would increase. A continuous course of drug medication for this dog would be of concern, as the administering of the drug to the dog would be the owner's responsibility. On the other hand, as finasteride is a temporary treatment, BPH will recur when the treatment is discontinued. In this dog, there was no evidence of other disorders such as coagulopathy, blood parasite infection or other prostatic disorders.

Both finasteride and deslorelin were effective at decreasing the prostatic volume, but there were some differences in the percentage changes of the prostatic volume for some treatment periods. At 4 wk of treatment, the percentage decrease in the prostatic volume in the finasteride treatment group was 34.02% which was greater than in the deslorelin treatment group (13.02%). The maximum percentage decrease in the prostatic volume in the finasteride treatment group was

Table 4 Results of bacterial growth in semen culture from dogs undergoing finasteride and deslorelin treatment.

Week of treatment	0	4	8	16
Finasteride treatment	0/7	0/6	0/7	0/7
Deslorelin treatment	0/8	0/3*	1/1**	-

Values shown are the number of dogs showing bacterial growth/total number of dogs in that treatment.

Bacterial growth was considered when bacteria was cultured and exceeded 10,000 colony forming units.mL⁻¹ (Sirinarumitr *et al.*, 2001).

* Seven dogs successfully produced semen. Only three samples were submitted for bacterial culture. One dog had anejaculation.

** The other seven dogs had anejaculation after 8 wk of deslorelin treatment.

55.88% after 8 wk; however, in the deslorelin treatment group, the maximum decrease was 75.72% after 16 wk of treatment. Sirinarumitr *et al.* (2001) reported a significant decrease in the

percentage change (mean \pm SD) in the prostatic volume after 8 wk ($41.0\% \pm 23.8$) and 16 wk ($43.0\% \pm 29.0$) of treatment compared to before treatment using finasteride at rates of 0.1–0.5

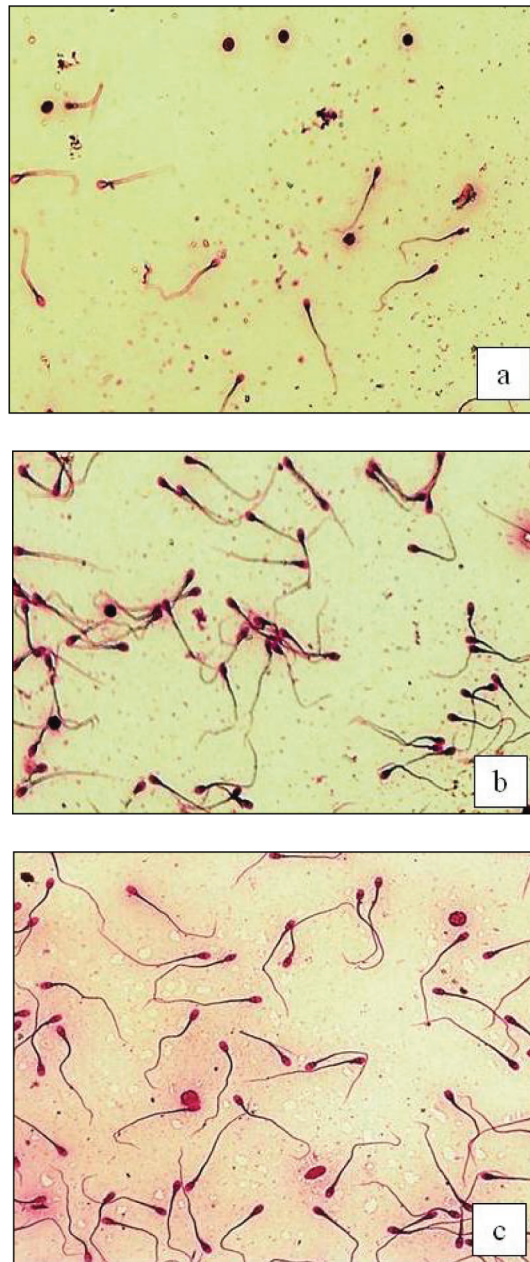


Figure 5 Series of semen cytology of one dog with benign prostatic hypertrophy after treatment with finasteride at: (a) 0 wk; (b) 4 wk; and (c) 8 wk of treatment. There were no inflammatory cells or neoplastic cells observed in the following weeks of treatment. Semen cytology was stained with a commercial Romanowsky stain variant (Diff Quick). Magnification = 200 \times .

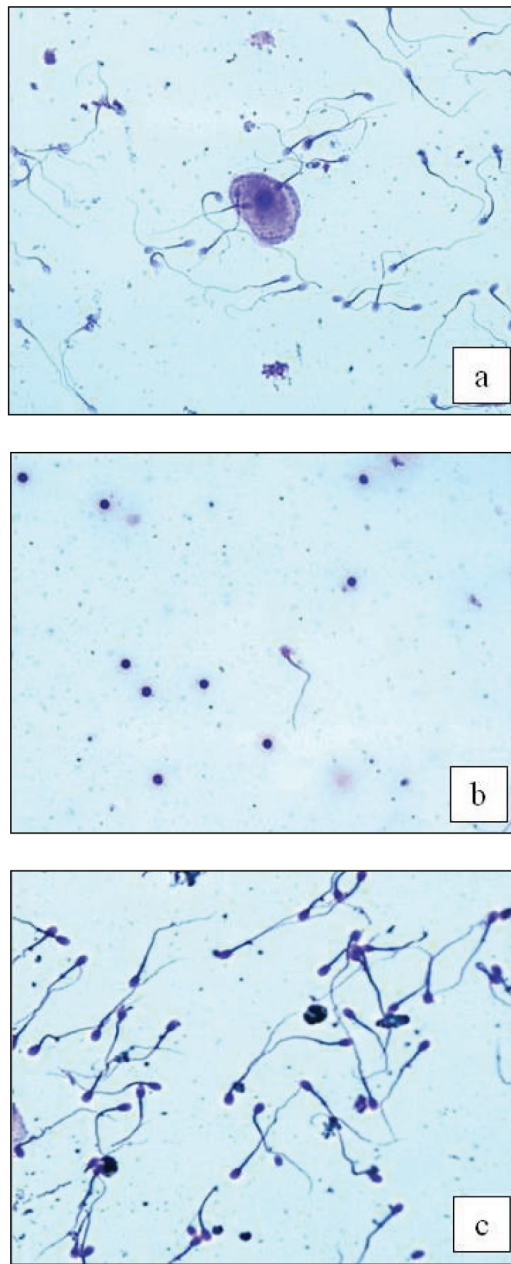


Figure 6 Series of semen cytology from one dog with benign prostatic hypertrophy after treatment with deslorelin at: (a) 0 wk; (b) 4 wk; and (c) 8 wk. There were no neoplastic cells observed in the ejaculation weeks during the treatment period. Seminal cytology was stained with a commercial Romanowsky stain variant (DiffQuick). Magnification = 200 \times . This figure shows images for the dog that had bacterial culture over 10,000 CFU.mL⁻¹ in wk 8 of treatment. There were some inflammatory cells in the semen cytology.

mg.kg⁻¹. In the current study, for the finasteride-treated dogs, there was a decrease in the mean percentage change of the prostatic volume from 55.88% after 8 wk of treatment to 42.64% after 16 wk of treatment compared to the before treatment volume. The results of the current study were comparable to the previous report.

In the finasteride treatment, there was no change in any of the semen evaluation results except for a decrease in the semen volume. The smaller size of the prostate affects the amount of prostatic fluid due to the majority of the semen in a dog being secreted from the prostate gland (Johnston *et al.*, 2001). Finasteride did not have an effect on any other parameters of semen quality. In practice, less semen volume has no effect on fertility (Johnston *et al.*, 2001). In contrast, with deslorelin there was low semen volume due to the treatment causing anejaculation in the dogs.

There was one dog in the deslorelin treatment group where 2.2×10^5 CFU.mL⁻¹ *Klebsiella* spp. was found after 8 wk of treatment, at which time the dog had been on an antimicrobial drug for 3 wk. Most dogs with BPH often have complications with prostatitis from bacterial infection, especially aerobic bacteria. Semen bacterial culture should be carried out as follow up to the disease. Prostatitis diagnosis is based on the level of the semen pathogen being greater than 10,000 CFU.mL⁻¹ (Sirinarumitr *et al.*, 2001), and the most probable pathogens are Enterobacteriaceae and *Pseudomonas aeruginosa*. Other Gram-negative bacilli are Enterococci, *Staphylococcus aureus* and beta-haemolytic streptococci. An appropriate antimicrobial drug is selected based on the results of a drug sensitivity test and is subscribed for 3–8 wk (Feldman and Nelson, 2004). Before using deslorelin as part of any treatment of a dog with BPH and coincident with prostatitis, any bacterial prostatitis should be cleared up before the dog undergoes any hormone implantation. After implantation, sex hormones will be suppressed, the prostate gland will shrink, and therefore the antimicrobial drugs will not be

well distributed through the prostate gland.

CONCLUSION

Both finasteride and deslorelin were effective to treat BPH in dogs. Finasteride has an effect on hypertrophic prostatic cells by a type II-5 alpha reductase inhibitor causing a decrease in DHT and a consequent shrinkage of the prostate gland. Finasteride had no effect on semen quality. Deslorelin has an effect on FSH and LH down regulation, followed by a decrease in androgen production and secretion, and consequent spermatogenesis suppression and prostate gland shrinkage, which lead to anejaculation. As there are differences in the drugs' mechanisms, veterinarians should consider their usage accordingly. Finasteride is a suitable drug for breeding stud dogs. Deslorelin is more suitable for dogs with anesthetic risk or where breeding is no longer a concern. Any disease recurrence should be monitored after treatment cessation in both cases because both medications provide only temporary BPH treatment in dogs.

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