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A Comparative Therapeutic Approach Against Benign Prostatic Hyperplasia (BPH) in Geriatric Dogs

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Abstract The present study aimed to compare the efficacy of an allopathic antiflogistic agent i.e. Finasteride with a synthetic anti estrogenic compound i.e. Tamoxifen citrate for the recovery of Benign Prostatic Hyperplasia (BPH) in 24 geriatric dogs. Twelve geriatric dogs clinically diagnosed for suffering with benign prostrate hyperplasia treated with Finasteride @ 0.2 mg/kg b.wt. Once daily orally for 16 weeks and another group consisting with 12 geriatric dogs with BPH treated with a synthetic anti estrogenic compound i.e. Tamoxifen citrate @ 0.2 mg/kg b.wt. Orally for 4 weeks. Recovery from BPH is diagnosed with regression of prostrate size by digital rectal palpation at fortnight interval upto 4 months of post treatment. The Hemato-biochemical changes of the said geriatric dogs recorded before and after the treatment. It could be inferred from the study that, all the two drugs were effective against BPH, but Finasteride was found more superior than Tamoxifen.

Keywords Therapeutic approach, Benign Prostatic Hyperplasia, Geriatric dogs.

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Introduction

Prostate disorders are commonly noticed in geriatric dogs particularly in un-neutered intact and middle-aged male dogs [1]. Types of prostate abnormalities seen in dogs include benign prostatic hyperplasia (BPH), cysts, abscesses, acute and chronic infections and neoplasia [2]. Neutering is often recommended as a part of therapy regardless of the type of prostatic disease presents [3]. It is important to determine early whether the dog has an easily treatable condition or something more serious like prostate cancer [4, 5]. The present research work is designed to probe into this disease to compare the efficacy of different drugs against benign prostatic hyperplasia (BPH) in geriatric dogs in and around Bhubaneswar.

Materials and Methods

The present study was undertaken in the Department of Veterinary clinical Medicine, College of Veterinary

Science and Animal Husbandry, OUAT, Bhubaneswar. In toto, 445 dogs presented at Teaching Veterinary Clinical Complex (TVCC) of the College ; Government Veterinary Hospitals and private pet clinics in and around Bhubaneswar city screened for BPH and only 57 geriatric dogs with one or more complaints / history of straining during urination and defecation, urinary incontinence, holding tail slightly away from back, dribbling blood from the penis during urination, lethargy, passing small thin tape-shaped faeces, in-coordination in movement particularly in back legs screened as suspected cases for benign prostatic hyperplasia (BPH). Rectal digital palpation was done for confirmation of BPH [6]. It was performed with assisted caudo-dorsal abdominal pressure, shifting the gland to the pelvic inlet which was easiest to achieve on a standing patient. On the medium sized dog, the prostate was physiologically the size of a walnut, with a smooth surface, solid consistency, free, isothermic and does not cause pain to the animal during rectal examination. Symmetry was evaluated after the central sulcus was identified on the dorsal surface of the gland. From this sulcus, both right and left lobes of the same size originate [2]. Twenty-four geriatric dogs suffering from benign prostatic hyperplasia (BPH) were selected and equally divided into two groups viz., Group-I and Group-II and treated with one allopathic anti-flogistic agents i.e., Finasteride @ 0.2 mg/kg b.wt once daily orally for a period of 16 weeks to Group-I and one synthetic non-steroidal anti-estrogenic compound i.e., Tamoxifen[1] containing Tamoxifen citrate @ 0.2 mg/kg b.wt given once daily orally for a period of 4 weeks to Group-II. The comparative efficacy of these drugs was judged on the basis of clinical recovery and regression of prostate size as detected through digital rectal palpation at fortnight interval upto 4 months post-treatment. Hematological and biochemical changes in the groups before and after the treatment recorded.

Results and Discussion

Out of 445 male geriatric dogs of various breeds and age groups examined for prostate disorders, 57 were found with BPH reflecting an overall prevalence of 12.8%. This high prevalence rate of BPH may be accounted for disproportionate sample size with respect to intact males, avoidance of mating, neutered males, more secretion of testosterone, rapidly changing of oestrogen/androgen ratio when oestrogen predominates and region-based managemental practices [1]. Finasteride, a synthetic steroid that prevents conversion of testosterone (T) into dihydrotestosterone ((DHT) by inhibition of the type II 5α-reductase has been a focus of medical treatment of BPH in humans. A dose-response study found that administration of finasteride @ 0.1—0.5 mg/kg orally daily to healthy sexually male dogs caused a significant decrease in serum DHT concentration without affecting serum testosterone concentration [7]. Therefore, finasteride was selected for geriatric dogs with BPH in this study. The geriatric dogs of Group-I consisting of 12 dogs were treated with finasteride at the dose rate of 0.2 mg/kg b.wt orally once daily for a period of 16 weeks along with supportive therapy viz. antihistamine and liver tonics if required and recovery was observed after 16 weeks. All the dogs showed clinical recovery by disappearance of clinical signs like passing small thin tape-shaped faeces (91.6%), straining during urination and defecation (83.4%), urinary incontinence (66.6%), tenesmus (83.3%), haematuria/blood dribbling from penis (58.3%) and holding tail away from backward (75.0%). No side effect was observed in any of the dogs during the course of treatment. Similar observations were also reported by earlier workers [8] with finasteride treatment of older dogs with BPH. Finally, digital rectal examination (DRE) was performed for better assessment of the efficacy of the drug, finasteride which showed 83.4% of prostate coming to normal size (walnut), 66.6% having normal symmetry, surface contour of prostate becoming smooth (75.0%) from rough, consistency changing from soft to solid (58.3%), freely movable (50.0%), no pain on palpation (83.3%) and isothermic prostate (91.6%) dogs. These findings corroborate with the observations of [8] who also conducted digital rectal examination to compare the morphology of prostates after treatment with finasteride.

Dogs with benign prostatic hyperplasia (BPH) were treated with one antiphlogistic drug i.e., Finasteride and a synthetic non-steroidal anti-estrogenic preparation i.e., Tamoxifen along with appropriate supportive therapy and the blood samples were collected on 16 and 4 weeks of treatment, respectively (Table 1). The results of the study indicated that the

Table 1. Effects of treatment on hematological parameters of geriatric dogs with BPH. Figures in parentheses indicate minimum and maximum values.

Para-meters	Dogs showing (BPH) before treatment (n = 24)	Group–I after 16 weeks (Mean ± SE)	Group–II after 4 weeks (Mean ± SE)
Hb (g/dl)	11.21 ± 0.45 (10.92–11.63)	11.05 ± 0.91 (10.20–12.40)	10.01±0.87 (9.8–11.6)
PCV (%)	34.34 ± 3.71 (31.20–38.18)	34.01±3.51 (30.4–38.2)	31.21±2.96 (28.6–34.2)
TEC (n × 10/µl)	6.76 ± 0.25 (6.20 –7.01)	6.38±0.62 (5.72–7.48)	5.91±0.70 (4.86–7.24)
TLC (n×10^3/µl)	10.61 ± 0.86 (9.25–11.37)	10.21±1.43 (8.21–11.34)	9.02±1.28 (6.98–10.83)
Neutrophils (%)	66.90 ± 4.25 (61.8–72.9)	65.83±2.22 (64–67)	64.65±2.35 (62–65)
Eosinophils	8.90 ± 0.41 (7.8–9.64)	5.26±0.37 (5–6)	4.86±0.18 (4–5)
Basophils	–	–	–
Lymphocytes	18.70 ± 0.89 (16.8–20.47)	22.51±3.18 (18–26)	21.93±2.86 (18–23)
Monocytes	5.5 ± 0.22 (4.99–5.92)	4.75±0.38 (3–5)	4.09±0.37 (2–6)

hematological parameters for Hb, PCV, TEC, TLC and DLC were 11.05 g/dl, 34.01%, 6.38 ×10^6 µl, 10.21 ×10^3µl, 65.83% for neutrophils, 5.26% for eosinophils, 22.51% for lymphocytes and 4.75% for monocytes in the group-I affected dogs treated with Finasteride and 10.01 g/dl, 31.21%, 5.91× 10^6µl, 9.02 × 10^3µl, 64.65% for neutrophils, 4.86% for eosinophils, 21.93% for lymphocytes and 4.09% for monocytes in the group–II affected dogs treated with Tamoxifen. On comparision of the above values to that of dogs having BPH before treatment, significant variations were observed in the values of eosinophils and lymphocytes and minor alterations were observed in the values of TLC, neutrophils and monocytes of groups–I treated with Finasteride. However, the other group-II treated with Tamoxifen, the significant variations were noticed on the values of eosinophils and lymphocytes and some minor variations noticed were analyzed to be statistically non-significant in the values of Hb, PCV, TEC, TLC, neutrophils and monocytes. It could be inferred from the results that, all the two drugs were effective against BPH, but Finasteride was found more superior than Tamoxifen (Table 1).

Mean±SE biochemical values of the geriatric dogs 16th weeks after treatment with Finasteride against BPH were analyzed as 5.02 mol/L for glucose, 60.08 mmol/L for creatinine, 4.25 mmol/L for BUN, 47.6 g/L for total protein, 18.5 g/L for albumin, 25.7 g/L for globulin, 0.81 for A : G ratio and 4.21 mmol/L for potassium (Table 2). Above values were at par with the biochemical data recorded for apparently healthy geriatric dogs but on the other hand, the values recorded for above parameters were 4.98 mmol/L, 62.51 mmol/L, 5.23 mmol/L, 43.12 g/L, 15.4 mmol/L, 24.8 g/L, 0.58 and 3.92 mmol/L in the groups treated with Tamoxifen.

Results of the major clinical signs recovery after 16th weeks of treatment with finasteride (Group-I) and Tamoxifen (Group-II) to geriatric dogs suffering from BPH were recorded. In the group-I treated dogs with finasteride, the major clinical signs viz. passing small thin tape-shaped faeces, straining during urination and defecation, urinary incontinence, tenesmus, hematuria / blood dribbling from penis and holding tail away from backward were recovered in 91.6%, 83.4%, 66.6%, 83.3%, 58.3% and 75.0%, respectively as against 66.6%, 50.0%, 41.7%, 58.3%, 33.3% and 41.7% of dogs treated with tamoxifen (Group-II). Similar observations were also reported by earlier workers [7—

Table 2. Effects of treatment on biochemical alterations of geriatric dogs with BPH. Figures in parentheses indicate minimum and maximum values.

Para-meters	Dogs showing (BPH) before treatment (n=24)	Group–I dogs 16 weeks after treatment (Mean ± SE)	Group–II dogs 4 weeks after treatment (Mean ± SE)
Blood glucose (mmol/L)	4.99±0.32 (4.12–5.25)	5.02±0.68 (3.65–6.42)	4.98±0.63 (3.8–6.02)
Serum Creatinine (µmol/L)	62.5±0.48 (55.9–69.1)	60.08±4.10 (49.6–65.2)	62.51±4.33 (50.27–70.6)
BUN (mmol/L)	5.79±0.54 (4.99–6.13)	4.25±0.64 (3.99–5.01)	5.23±0.49 (4.73–5.78)
Total Protein (g/L)	43.1±5.2 (39.2–50.1)	47.6±2.9 (42.1–57.8)	43.12±3.9 (40.14–46.2)
Albumin (g/L)	13.3±1.2 (11.9–14.8)	18.5±3.6 (16.3–22.2)	15.4±3.1 (12.3–21.9)
Globulin (g/L)	24.9±3.1 (15.2–20.45)	25.7±1.6 (23.2–27.9)	24.8±1.3 (22.18–26.3)
A : G	0.67±0.05 (0.51–0.69)	0.81±0.5 (0.6–0.9)	0.58±0.4 (0.59–0.9)
Potassium (mmol/L)	3.94±0.18 (3.64–4.35)	4.21±0.9 (3.8–4.7)	3.92±0.2 (3.78–4.2)

10] with finasteride treatment of older dogs with BPH.

Although treatment with finasteride is costlier, it is more efficacious than tamoxifen within a short period. Therefore, keeping its early efficacy, easy availability in market, no side effects and little more cost effectiveness, Finasteride is considered suitable for the treatment of BPH in geriatric dogs [10]. All the dogs recovered from BPH were kept under supervision upto three months to note the recurrence of the disease. However, recurrence was not recorded in any of the cases during the period of observation in the present investigation.

Comparative analysis of the results of the study revealed that the therapeutic efficacy of Finasteride is quite comparable to that of Tamoxifen against benign prostatic hyperplasia. Such observation was further substantiated by the return of hemato-biochemical parameters such as Hb, PCV, TEC, TLC, blood DC, blood glucose , serum creatinine, BUN, serum total protein, serum albumin, serum globulin, A : G and serum potassium counts to normal range after recovery with two drugs.

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