A retrospective study of canine prostatic diseases from 2002 to 2009 at the Alfort Veterinary College in France

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ABSTRACT

A retrospective study was used to investigate the incidence of prostatic diseases in a large population of dogs at Alfort Veterinary Hospital and to clarify epidemiologic features, which might be of a great help to veterinarians in managing and discriminating prostatic disorders. During the investigation period, a total of 72,300 male dogs (coming mainly from the Ile-de-France region) were registered in the Alfort Veterinary College database, and 481 of them (0.7%) were found to have prostatic disorder. The diagnosis was carried out on the basis of clinical signs and ultrasound findings. Among dogs experiencing a prostatic disorder, most frequently recorded diseases were benign prostatic hyperplasia (45.9%) and prostatitis (38.5%), followed by abscesses (7.7%), cysts (5.0%), neoplasia (2.6%), and squamous metaplasia (0.2%). Our study revealed an incidence of 0.3% of prostatic disorders observed in intact male dogs, except in the case of prostatic neoplasia. The mean age of the dogs experiencing prostatic disorders was 8.6 ± 3.2 years. This was significantly different ($P < 0.001$). Large dogs were significantly more affected by prostatic disorders ($P < 0.05$), except for prostatic neoplasia. A breed predisposition was suspected in German Shepherd (odds ratio [OR] = 2.1; 95% confidence interval [CI]: 1.5–2.9), Rottweiler (OR = 1.8; 95% CI: 1.2–2.7), American Staffordshire Terrier (OR = 3.8; 95% CI: 2.5–5.8), Berger de Beauce (OR = 3.7; 95% CI: 2.2–6.1), and Bernese Mountain Dog (OR = 2.5; 95% CI: 1.3–4.7).

1. Introduction

The prostate is the sole accessory gland of the canine urogenital tract [1] and mainly plays a role in secretion of prostatic fluid which is acidic, which plays a bactericidal role during rest by preventing ascending bacterial infections and has a major role during ejaculation in the production of the seminal fluid [2] in which it acts in both support and transport of sperm [3,4]. Moreover, recent studies report that the prostatic fluid appears to have an important role in modulating uterine contractions and fertility in bitches [5]. This secretion is a continuous and retrograde reflux that occurs in a natural way in the urinary bladder [6]. Changes in the prostatic fluid composition related to any of them may therefore lead to clinical expression at the urinary and/or at the reproductive level [7–9].

The diseases of prostate gland are relatively common in male dogs especially intact males aged older than 6 years [9].

According to most classifications [6,8,9], seven prostatic disorders might be considered: benign prostatic hyperplasia (BPH), acute and/or chronic prostatitis, prostatic cysts, prostatic abscesses, squamous metaplasia of the prostate, and prostatic neoplasia. It is however often difficult, from a clinical point of view, to discriminate different pathologic conditions of the prostate due to a lack of

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pathognomonic symptoms or findings of collateral examinations.

Unfortunately, little epidemiologic data are available from the literature [10,11] and is sometimes contradictory. The aim of this work was to investigate the incidence of prostatic diseases in a large population of dogs and to clarify epidemiologic features, which might be a great help to veterinarians in managing and discriminating prostatic disorders.

2. Materials and methods

2.1. Database set-up

The computerized Alfort Veterinary College (Paris, France) database was compiled for clinical cases concerning or evocative of prostatic diseases among all male dogs seen in consultation, whatever the type of consultation (internal medicine, cardiology, dermatology, and so forth). The period of investigation ranged from December 1, 2002 to September 1, 2009.

When a case evocative of prostatic trouble had been suspected by the clinicians and mentioned on the database, a posteriori for our study, we registered the following parameters: age, breed, weight, genital status (intact or neutered), purpose of consultation, general condition at the time of consultation, and clinical symptoms and complementary examinations performed and their findings.

Final diagnosis, when obtained, was made by the clinician in charge of the case.

One line of the table was used for each male dog, even if this individual came several times for consultation, to avoid any redundant data.

The six following pathologies were considered: BPH, prostatic cysts, squamous metaplasia of the prostate, prostatitis, prostatic abscesses, and prostatic neoplasia.

2.2. Database analysis

Incidence of prostatic diseases among the studied population, as defined by the number of dogs experiencing a prostatic disorder divided by the total number of dogs seen in consultation during the period of investigation, was determined. Incidence of the different prostate diseases was calculated as the ratio between the number of dogs experiencing a prostatic disorder (BPH, cysts, metaplasia, prostatitis, abscesses, or neoplasia) divided by the total number of dogs experiencing prostatic diseases.

Breeds of dogs were considered, and their importance among the sample was quantified. When no clear indication concerning its belonging to a given breed was available, the dog was considered as a mongrel. Importance of small ($<$10 kg), medium (between 10 and 20 kg), and large ($>$20 kg) dogs was then determined.

The proportion of neutered dogs in our sample was also measured.

There was a suspicion of a prostatic problem when at least the clinical symptoms and the ultrasound aspect of the prostate were both evocative. On this basis, we first considered all the diagnoses that were done by the clinician in charge of the case (what we called "presumptive

prostatic problems"). We analyzed retrospectively deeply all the complementary examinations that had been performed for each case to confirm the presumptive diagnosis. What we defined as "definitive prostatic problems" was obtained either: when the diagnosis had been made on the basis of histology, after prostatic biopsy, or following the criteria defined in Table 1 (in the following section).

2.3. Prostatic disorders features

Clinical symptoms are summarized in Table 2. The dogs were considered symptomatic when they showed one or more of the clinical signs reported in Table 2, or asymptomatic when they did not show any signs reported in Table 2, and the dogs came for consultation for fertility problems.

Incidence of prostatic diseases in dogs presented for fertility problems was assessed as the number of males presenting a prostatic disorder divided by the total number of dogs presented for fertility problems during the investigation period.

2.4. Statistical analysis

Study data were exported from the Alfort Veterinary College database to a spreadsheet (Microsoft Office Excel 2007; Microsoft Corp.) and then to SPSS 20.0 (SPSS Inc., Chicago, USA) for statistical analyses. Demographic variables were described statistically for the overall dogs seen in consultation during the period of investigation and in particular for the dogs experiencing prostatic disorders. Association between demographic variables and prostatic disease or single pathologies (when the number of dogs in a given pathology was $\geq$10) was evaluated. Analysis of continuous variables was performed by t-test or ANOVA followed by Bonferroni post hoc test and were expressed as mean $\pm$ standard deviation. Categorical data were given in numbers and percentages and analyzed using chi-square goodness of fit tests, a cross-tabulation, and chi-square or Fisher's exact test. In addition, to study the relationship between breed (when the number of dogs in a given breed was

Table 1
Way of determining the "definitive diagnosis" of prostatic disorders.

Prostatic disorder	Definitive diagnosis
BPH	Evocative clinical signs and ultrasonographic enlargement of prostate and no evidence of inflammation or infection (urine culture, prostatic fluid examination)
Prostatitis	Evocative clinical signs (Johnston et al. 2001) and abnormal ultrasound and evidence of inflammation or infection (urine culture, prostatic fluid examination
Cysts	Ultrasonographic anechoic areas and no purulent content (ultrasound-guided aspiration or during surgery)
Prostatic abscesses	Ultrasonographic echoic areas and purulent content (ultrasound-guided aspiration or during surgery)
Prostatic neoplasia	Abnormal ultrasound and biopsy. Only biopsy results were considered
Squamous metaplasia	Abnormal ultrasound and biopsy. Only biopsy results were considered

Abbreviation: BPH, benign prostatic hyperplasia.