

Effectiveness of different pharmacological approaches on post-ovariohysterectomy urinary incontinence in the bitch

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Summary: In this study, the effectiveness of different pharmacological approaches on urinary incontinence encountered following ovariohysterectomy in the bitch was investigated. Eleven ovariohysterectomised bitches were used. Ephedrine hydrochloride (EHCl) tablets were used at the dose of 2 mg/kg twice a day in group I (n = 6). EHCl treatment was followed by Estradiol Benzoate administrations in cases, which did not recover totally. Estriol (Incurin®) was used (1 mg/kg/dog PO) for first seven days and a half dose was used for consecutive days in group II (n = 5). Clinical signs diminished in 50% of EHCl treated bitches and a total recovery was observed in 33.3% of cases. Total recovery rate was 66.7% after Estradiol Benzoate treatment. Duration of the treatments in group I was between 10 – 16 days. Incurin® (Estriol) treatment was effective in 80% of cases and duration of treatments including half dose administrations was 9 – 14 days. While additional treatment was needed in some of EHCl treated dogs, no recurrences were observed in group II. In conclusion, Estriol treatment is highly effective in post-ovariohysterectomy urinary incontinence in the bitch.

Key words: Bitch, ephedrine, estriol, urinary incontinence.

Ovariohisterektomi sonrası üriner inkontinens gelişen köpeklerde değişik medikal tedavilerin etkisi

Özet: Bu çalışmada ovariohisterektomi sonrası görülen üriner inkontinens olgularında değişik konservatif tedavilerin etkisinin araştırılması amaçlanmıştır. Çalışma 11 dişi köpekte gerçekleştirilmiştir. Birinci grupta (n = 6) Efedrin Hidroklorür (EHCl) tabletleri 2 mg/kg dozunda günde iki kez uygulanmıştır. Semptomların azaldığı ancak tümüyle iyileşmenin gerçekleşmediği olgularda EHCl sağaltımından sonra Östradiol Benzoat uygulanmıştır. İkinci grupta (n = 5) Östriol (Incurin®) başlangıçta 7 gün boyunca 1 tablet (oral, 1 mg/köpek) olarak uygulanmıştır. Daha sonra doz yarım tablete düşürülerek tedaviye devam edilmiştir. Olguların %50'sinde EHCl uygulamasından sonra semptomlarda azalma olmuş, tam iyileşme saptanan olguların oranı ise %33.3 olarak bulunmuştur. Östradiol Benzoat uygulamalarından sonra sağaltılan olgu oranı %66.7'ye çıkmıştır. Birinci grup için uygulamalar 10-16 gün sürmüştür. Incurin® (östriol) ile elde edilen iyileşme oranı %80 olmuş ve yarıya düşürülen dozlar da dahil olmak üzere inkontinens semptomları düzeline kadar 9 ile 14 günlük uygulama yapılmıştır. EHCl kullanılan olguların bazılarının yeniden sağaltıma alınması gerekirken, Östriol uygulamasından sonra iyileşen dişi köpeklerde inkontinens olgusu tekrar etmemiştir. Bu çalışmada Incurin® (Östriol) uygulamalarının ovariohisterektomiden sonra gelişen üriner inkontinens olgularının sağaltımında başarılı olduğu saptanmıştır.

Anahtar sözcükler: Dişi köpek, efedrin, östriol, üriner inkontinens.

Introduction

Indications of ovariohysterectomy in the bitch include prevention of necessity for observation of estrous signs and the use of suppressing drugs. It is also a radical way of contraception. In addition, ovariohysterectomy is a choice of treatment in cases such as metropathies and reproductive tract neoplasms (2). Urinary incontinence is one of the most common side effects of ovariohysterectomy or ovariectomy, and is usually encountered a few years following the surgery. Epidemiological studies indicate a statistically significant relationship between ovariohysterectomy and urinary incontinence (19). Since estrogen treatment is effective in

post-ovariohysterectomy urinary incontinence in bitches, it is also called 'Estrogen-Responsive Urinary Incontinence' (12, 14). The treatment is based on stimulating affect of estrogens on responsiveness of urethral α -receptors to α -agonists (8,15). Estrogens also affect smooth muscles and perineal tissues (11). Diethylstilbestrol and Estradiol Cypionate are not currently used due to bone marrow toxicity and depression (14). Usually Estriol in form of tablets, which could be used effectively, at small doses, is preferred (7). Alpha-adrenergic drugs i.e. Ephedrine and Phenylpropanolamine are effective in closure of relaxed urethral sphincter (4).

In this study, it was aimed to investigate the efficacy of different pharmacological treatments on urinary incontinence in ovariohysterectomised bitches.

Material and Methods

Eleven ovariohysterectomised bitches, which were brought to the Clinics of the Department of Obstetrics and Gynecology, Faculty of Veterinary Medicine, University of Ankara with the complaints of urinary incontinence, were used in the study. Diagnosis was based on history of a previous ovariohysterectomy time elapsed from the operation to clinical examination and occurrence of urinary incontinence especially in the nights when dogs are asleep (4). The dogs were divided into two groups according to treatment chosen.

Ephedrine hydrochloride tablets (2 mg/kg PO) were used twice a day in group I (n = 6). Estradiol Benzoate treatment was started in cases which signs diminished but not fully recovered during the Ephedrine treatment period that lasted at least 10 days. Estriol tablets (1 mg/dog PO; Incurin®; Fa.Intervet) were used for 7 days in group II (n = 5). Treatment was continued at half dose (0.5 mg/dog PO) on towards in dogs with inadequate clinical response.

History of the animals (age, breed, time after ovariohysterectomy), duration of the treatment, level and timing of recovery, recurrences and additional administrations were evaluated.

Results

Mean age of the animals was 7.90 ± 1.48 (5.0 – 10.0) years and the time elapsed since ovariohysterectomy was 2.18 ± 0.68 (1.0 – 3.0) years. History of animals also revealed that the owners were not about to take their dogs to the clinic immediately after observing the urinary incontinence but after a mean duration of 14.0 ± 4.28 (6.0 – 20.0) months. When breed of dogs was considered, Boxer and German shepherd dogs constituted 36.3% and 27.3% of all animals, respectively (Table 1).

A decrease in the number of urinations per day was observed in Ephedrine or Ephedrine and Estradiol Benzoate groups within 10 – 16 days of the treatment. Clinical signs were diminished but not recover fully in 50% of cases after Ephedrine administrations. Four animals in group I (66.6%) responded to the treatment. Estradiol Benzoate was administrated after a significant response to Ephedrine in 2 of these animals. Other 2 Ephedrine responsive dogs were totally out of incontinence (33.3%), nevertheless, treatment had to be repeated after 3 and 4 months, respectively (Table 2).

Incurin® (Estriol) treatment was successful in 4/5 (80%) of animals. The treatments took 9-14 days in this group. Besides, only half dose of incurin® was used in 3 of these dogs in which symptoms resolved to a great extent in first 7 days of full dose treatment. We did not observe any recurrences in 8 – 24 months following cessation of treatment (Table 3).

Table 1. The general parameters of the urinary incontinent bitches (n=11) after ovariohysterectomy
Tablo 1. Ovariohisterektomi sonrası üriner inkontinens görülen dişi köpeklerle (n=11) ait genel parametreler.

Age (year)	Time between ovariohysterectomy and incontinence (year)	Time between incontinence and start of treatment (month)	Breeds of dogs		
			Boxer	German shepherd	Others
7.90 ± 1.48 (5.00-10.0)	2.18 ± 0.68 (1.00-3.00)	14.0 ± 4.28 (6.0 – 20.0)	(n=4) 36.3%	(n=3) 27.3%	(n=4) 36.3%

Table 2. The results of Ephedrine Hydrochloride administrations in urinary incontinent bitches
Tablo 2. Üriner inkontinens görülen dişi köpeklerde Efedrin Hidroklorür uygulamasının sonuçları.

Breed	Age	Treatment duration (day)	Ovariohysterectomy/ Incontinence time (year)	Duration of incontinence (month)	Clinical response	Additional treatment	Result
Boxer	8	10	1.5	18	⊥	Estradiol Benzoate	+
German shepherd	9	14	2.5	8	⊥	Estradiol Benzoate	+
Boxer	10	16	3.0	14	⊥	Estradiol Benzoate	-
Boxer	7	12	2.0	16	+	recurrence 3 months later EHCl (10 days)	+
Belgian shepherd	9.5	13	1.5	20	+	recurrence 4 months later EHCl (15 days)	+
Terrier	6.5	15	10.0	12	⊥	Estradiol Benzoate	-

⊥ indicate decreasing in symptoms of urinary incontinence

Table 3. The results of Incurin® administrations in urinary incontinent bitches
 Tablo 3. Üriner inkontinens görülen dişi köpeklerde Incurin® uygulamasının sonuçları.

Breed	Age (year)	Ovariohysterectomy (year)	Incontinence (month)	Treatment (dayXtablet)	Result
Irish setter	8.5	3	12	7x1 4x1/2 (Add)*	+ (18 month)
German shepherd	9.0	2	6	7x1 4x1/2 (Add)*	+ (12 month)
Golden retriever	7.5	2.5	14	8x1	+ (8 month)
Boxer	7.0	2.0	18	7x1 7x1/2 (Add)*	+ (24 month)
Boxer	5.0	3.0	16	9x1	-

* Indicates additional treatment

Discussion

Although relaxation of urinary sphincter after ovariohysterectomy is the main cause of urinary incontinence, other possible causes should also be considered in an incontinent bitch (3). Neurological problems have been related to urinary incontinence (6). Recently, it has been reported that blood Follicle Stimulating Hormone (FSH) and Luteinising Hormone (LH) concentrations in ovariohysterectomised bitches are 5 – 15 times of intact anestrus bitches due to removal of feed-back effect on hypothalamus-hypophysis system (16). Accordingly, GnRH analogs alone or in combination with phenylpropanolamine are considered as a conservative treatment choice (14). In addition, submucosal collagen injections at urethra proximalis under endoscopic examination are suggested in unresponsive bitches (3, 4). Classical history of urinary incontinence, especially while the dog is asleep, in an ovariohysterectomised bitch generally reminds post-ovariohysterectomy urinary incontinence (2). All of the bitches in this study had incontinence while they were asleep and 4 of them (36.4%) also had incontinence during the whole day.

Urinary incontinence is one of the most common complications of ovariohysterectomy (6). It is generally encountered in first 1-3 years following the operation (1, 5, 10, 17). Mean interval of 2.18 years from ovariohysterectomy to the appearance of urinary incontinence symptoms in our study is consistent with the previous reports.

In spite of the small number of animals in the study, most of the animals were Boxer breed. Although there are some results that post-spaying urinary incontinence incidence in Boxer dogs varies between 46% and 65% (1, 5), Larsen and Rasmussen (13) reported the incidence as 15%. In addition, the incidence in Doberman Pinchers was reported to be between 8% and 46% (13).

Rüchstuhl (18) mentioned that dogs heavier than 20 kg of body weight are more prone (30.9%) to have

urinary incontinence than small breeds. Boxer dogs are in this body weight group.

It was unexpected that the owners brought their dogs after some time from the first signs of incontinence. However, Blendinger et al. (6) reported that they were able to start the treatment 6, 12 - 18, > 24 months following the first signs of incontinence in 16, 5 and 2 bitches in their study, respectively.

Estradiol Benzoate is a treatment option in cases α -adrenergic symphatomimetics fail to cause sufficient response (4). Additional estrogen treatment was needed in 66.6% of cases in this study. Additional treatment was successful in 2 of 4 dogs. Success in Ephedrine group of our study is parallel to that of Arnold at all (5) who reported 73.3% effectiveness and 23.7% success. Accordingly, Ephedrine administrations were effective in 50% of cases in this study. Incontinence was significantly reduced from 3 – 4 times a day to once a day or once in 2 – 3 days. However, Ephedrine alone was totally effective in only 33.3% of all cases. It is shown that recurrences might be observed and occasionally additional treatment is needed after Ephedrine administrations (3, 7). In agreement with this, 2 bitches in our study received additional treatments.

Incurin® contains active estriol. Estriol, a short-acting compound, is out of side effects caused by other estrogenic compounds in dogs such as bone marrow depression and pyometra. Incurin® was found to be highly effective (83%) in a study including 133 incontinent bitches (9). Efficacy of Incurin® treatment in this study was 80% and there were no recurrences in a period of 8 – 24 months after cessation of treatment. Clinical trials point out variable response of incontinent dogs to Estriol treatment and mention the need for individual dose arrangement in each case. In addition, timing of response is also variable dose might be rearranged during the treatment in some cases (9). Different duration of treatments and no need of additional administrations in some bitches are in

consistence with those results. It is also of importance to continue the treatment at half doses for success.

In summary, Ephedrine administrations alone or in combination with other pharmacological agents were found to be both time consuming due to repeated injections and recurrences and less effective. In contrast, Estriol treatment was highly effective without recurrences.

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