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THE EFFECTS OF EXOGENE GnRH ON PLASMA TESTOSTERONE CONCENTRATIONS IN ANATOLIAN SHEPHERD DOG

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Anadolu Çoban Köpeklerinde Eksojen GnRH'ın Plazma Testosteron Seviyesi Üzerine Etkileri

Özet: *Bu çalışmanın amacı erkek safkan Anadolu çoban köpeklerinde GnRH uygulamasından önce ve sonra kan testosteron konsantrasyonunu incelemek ve libidoyu uyarmadaki etkinliğini ortaya koymaktır.*

Bir GnRH analoğu olan Buserelin, 2-5 yaşlı 6 köpeğe 25 μg dozunda kas içi yol ile uygulandı. GnRH uygulamasından önce ve 1, 2 ve 3 saat sonra periferal plazma testosteron konsantrasyonu (T) radioimmunoassay ile saptandı. GnRH enjeksiyonundan önce plazma T seviyesi 2.4±1.6 ng/ml idi. Uygulamadan sonraki 1, 2 ve 3. saatlerde T seviyesi sırasıyla 5.4±3.05, 3.2±1.1, 3.0±0.8 ng/ml saptandı. Bu sonuçlara göre tüm köpeklerdeki T seviyesi uygulamadan 1 saat sonra maksimum düzeye çıktı ($P<0.001$) ve uygulamayı izleyen 3. saatte bazal seviyeye indi ($P>0.001$). Çalışma sonucunda GnRH uygulaması safkan Anadolu çoban köpeklerinde T seviyesinde geçici bir artışa neden oldu ve bu uygulamanın damızlık amaçlı yetiştirmelerde libidoyu uyarmada önemli ölçüde yardımcı olabileceği kanısına varıldı.

Anahtar Kelimeler: *Testosteron, GnRH, Erkek Köpek.*

Summary: *The aim of present study was to investigate testosterone patterns before and after GnRH injection and to determined the efficacy of GnRH on inducing libido activity in male Anatolian shepherd dogs.*

A GnRH- analogue (Buserelin) was administered at the dosage of 25 μg to 2 to 5- years old intramusculary, 6 pure breed Anatolian shepherd male dogs. Peripheral plasma testosterone concentrations (T) were measured before and after GnRH injections. Blood samples were taken before GnRH injection and after GnRH injection every 60 min for a period of 3h. Plasma testosterone concentrations were determined by the radioimmunoassay. Before GnRH injections, plasma T levels were obtained 2.4±1.6 ng/ml. T levels were obtained

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5.4±3.05, 3.2±1.1, 3.0±0.8 ng/ml respectively, 1h, 2h and 3h after the injection. According to the results, T levels of all the dogs reached the maximum level 1h after GnRH injections (P<0.001) and returned to the baseline 3h after GnRH stimulation (P>0.001). We concluded that GnRH teratment induced transitory increases in the testosterone concentration in pure breed Anatolian shepherd male dogs and it has been proved that this procedure may be helpful in order to stimulate libido for breeding dogs to a great extent.

Key Words: *Testosterone, GnRH, Male Dog.*

Introduction

Plasma testosterone plays an important role in maintaining libido and spermatogenesis in the male. Testosterone deficinecy will result in loss of libido. Pituitary dysfunction with impaired secretion of FSH and LH will result in decreased libido and impaired spermatogesis. If irreversible but non-life threatening primary disorders are present, gonadotropin therapy may be initiated for the infertility problem. Therapy must be designed to stimulate both libido and spermatogenezis. The secretion of testosterone is regulated by luteinizing hormone from the pituitary gonadotropins and probably by gonadotropin-releasing hormone from hypothalamus (6, 7, 10).

The reported normal range is 0.4 to 10 ng/ml, although some researches are found between 1 and 4 ng/ml. Plasma T levels in the normal dogs reach the maximum level either 60 or 90 min after GnRH injection (4, 5, 7).

The aim of present study was to investigate testosterone patterns before and after GnRH injection and to determined the efficacy of GnRH on inducing libido activity in male Anatolian shepherd dogs.

Materials and Methods

The study was carried out in February and the dogs were kept in closed kennels and fed with balanced diet.

In this study, sexually mature healthy and no fertility problems, 6 pure breed Anatolian shepherd dogs (aged beetween 2 and 5 years old) were used as materials. GnRH analogue (Buserelin) was administered at the dosage of 25μg to intramusculary all the materials. Blood samples were taken from the vena cephalica antebrachia before the injection and after the injection every 60 min for a period of 3h. Plasma testosterone concentrations were determined by the RIA.

The statistical calculations were made by way of the analysis of variance and the t-test method.

Results

Before GnRH injection concentrations of avarage testosterone in plasma were 2.4±1.6 ng/ml. And 1h, 2h and 3h after the injection concentrations of avarage testosterone levels 5.4±3.0, 3.2±1.1, 3.0±0.8 ng/ml respectively.

The peripheral plasma T levels of all 6 dogs reached peak level the within 60 min after GnRH injection and T levels returned to the baseline 120 and 180 min after the injection. Only in one dog, the level of plasma testosterone reached level of 11 ng/ml in 60 min and returned baseline level in 180 min. The individual (Figure 1) and mean (Figure 2) testosterone levels are shown.

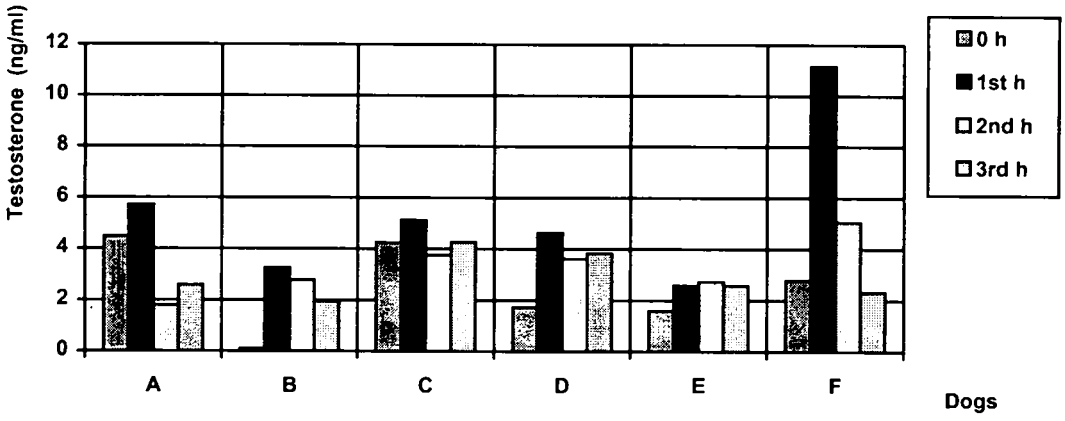

Fig.1. Individual (n=6) testosterone levels of dogs before GnRH injection(0) and 1st, 2nd and 3rd hours after GnRH injection.
Grafik 1.GnRH uygulamasından önce ve uygulamadan 1, 2, ve 3 saat sonra bireysel testosteron kansantrasyonu

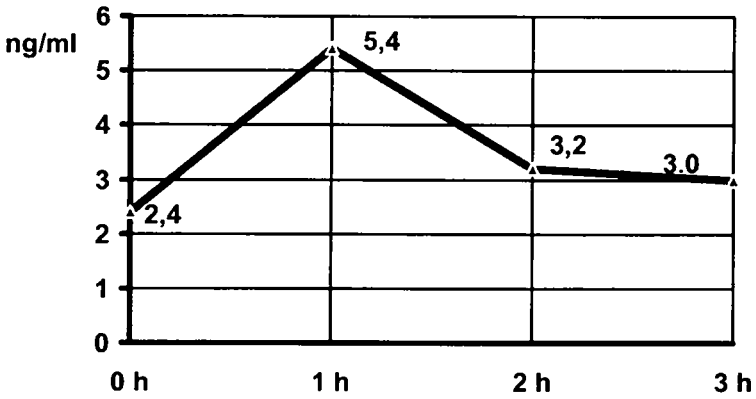

Fig.2. Mean testosterone levels of dogs (n=6) before GnRH injection(0) and 1st, 2nd and 3rd hours after GnRH injection.
Grafik 2. GnRH enjeksiyonundan önce ve 1, 2 ve 3 saat sonraki ortalama testosteron konsantrasyonu

Discussion

In male dog, the reported normal testosterone range is 0.4 to 10.0 ng/ml, although some researchers (3, 6, 8) found between 1 and 4 ng/ml. However, several investigations are needed to elucidate the different effects of different GnRH preparations on testosterone concentration .Several researchers (1, 3) found plasma concentrations of testosterone in mature dogs may be fluctuated episodically.

Knol et al. (8), reported that testosterone peaked 60 min after GnRH injection and testosterone concentration returned to baseline concentrations in 4 h after the injection. In addition to this some researchers (1, 2, 3) reported that testosterone concentration increased 60 and 90 min after GnRH injection.

Kawakami et al. (4) and Shafik et al. (9) reported that the plasma T levels of normal adult dogs peaked 60 and 90 min after an intravenous injection of LH-RH-A. Their results are similar those obtained in the present study.

We found that the peripheral plasma T levels of all 6 dogs reached level the maximum 60 min after GnRH injection and T levels returned to the baseline 120 and 180 min after the injection.

Our results indicate that GnRH treatment induced transitory increases in the testosterone concentrations in pure breed Anatolian shepherd dogs and it has been proved that this procedure may be helpful in order to stimulate libido for breeding dogs to a great extent.

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