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HYPOPROLACTINEMIA FOLLOWING INTRADERMAL ADMINISTRATION OF OUABAIN IN *UROMASTIX HARDWICKII*

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ABSTRACT

A variety of drugs can alter the secretion of prolactin (PRL) by the pituitary gland in most animals. Secretion of prolactin is predominantly, under negative control of hypothalamus, and in this respect, it is unique among the pituitary hormones. This study was undertaken to evaluate the crop-sac diameterical response to ouabain treated Uromastix pituitary suspension.

0.1 ml suspension of ouabain treated Uromastix pituitary gave a minimum diametric crop-sac response of 0.85 cm and a maximum of 0.95 cm. Data indicates that oubain promotes the secretion of prolactin inhibiting hormone (PRIH), and produces hypoprolactinemia.

INTRODUCTION

With the discovery of Prolactin (PRL), a lot of information was sought about its role in a wide variety of species. PRL has been found in the pituitary of reptiles and the evidence for the existence of the hormones in the lizard, *Uromastix hardwickii,* has been obtained by Ahmad *et al.* (2002).

Glycerides are distributed slowly almost to most of body tissues. Their concentrations in cardiac tissues are 15-30 times more than those in plasma at equilibrium.

Ouabain is a short acting cardiac glycoside. It is derived from *Strophanthus gratus,* a tropical tree. Ouabain is attached with 5-OH groups, is poorly absorbed following oral administration (Chen and Henderson, 1954; Doherty, 1972; Tse and Han, 1978). The primary site of action of glycoside is Na^+-K^+ ATPase of cell membrane which constitutes Na^+-K^+ pump. Glycoside binds to K^+ binding site and inhibits the pump thus causing increased Na^+ concentration which may reduce Na^+-Ca^{++} exchange (Rang *et al.,* 1996).

Certain neuroleptic drugs, like Dopamine causes hypoprolactinemia by inhibiting prolactin secretion via D_2-receptor blockade. Dopamine agonists such as BROMOCRIPTINE, APOMORPHINE are the drugs used clinically to suppress prolactin secretion. The dopamine antagonists PHENOTHIAZINE, BUTYROPHENONES and DOMPERIDONE and RESPERINE as dopamine-depleting agents are potent stimulants of PRL secretion (Rang *et al.,* 1996).

The purpose of this study is to establish the effect of Ouabain on the pituitary of Uromastix through crop-sac bioassay.

MATERIALS AND METHODS

Animals:

Pigeons 8 to 10 weeks old, belonging to white race, weighing about 340 g each, were used for crop-sac assay. Pigeons were obtained from local breeders. They were housed one to a cage and were fed millet and water *ad libitum.* They were kept in the laboratory for five days, including the period of bioassay.

Drug Treatment:

Uromastix obtained from local suppliers were injected intradermally with 0.5 mg ouabain in aqueous solution per day for 4 days. The animals were killed, pituitaries removed. Each pituitary after grinding with 0.4m1 of pyrogen free water was stored in a refrigerator. Another group of untreated animals were kept as control and their pituitaries extract were obtained in the same way.

Assay Procedure:

Assay procedure was that of Grosvenor and Turner (1958). Twelve pigeons were used for the bioassay. Feathers were plucked off from the skin overlying the crop-sac, six to eight hours before starting the injections. Same procedure was adopted to another group of twelve pigeons for comparison purpose.

Table 1
Pigeon crop-sac diametric response following intradermal injections of 0.5 mg ouabain treated lacertilian pituitary

Pigeons No.	Body weight of pigeon (gms)	Diametric response *cm
1	335	0.93
2	355	0.86
3	330	0.92
4	350	0.90
5	345	0.92
6	338	0.85
7	353	0.92
8	342	0.87
9	340	0.89
10	332	0.95
11	341	0.88
12	350	0.92
Mean	342.58 ± 8.18	0.90 ± 0.03

*Each figure is the mean of (right and left) twenty four crop-sac diametric measurements ± S.D.

Bioassay:

The injections of 0.5 mg pituitary suspension treated with ouabain was administered intradermally with a 1 ml hypodermic syringe bearing a 27 gauge needle, inserted at the geometrical centre of each crop gland (Hall, 1944) on both sides of birds (Table 1) per day for 4 days, at a point marked previously with a non toxic dye for subsequent reference. Similarly 0.5ml pituitary suspension of untreated *Uromastix* was administered intradermally to crop gland of control birds (Table 2).

Table 2
Crop-sac diametric response following intradermal injections of Normal *Uromastix hardwickii* pituitary suspension.

Pigeons No.	Pigeons Wt. (gms)	Crop-Sac *Diameteric cm
1	345	2.12
2	350	2.16
3	332	2.08
4	345	2.11
5	352	2.13
6	338	2.12
7	*355*	2.16
8	352	2.08
9	327	2.15
10	341	2.10
11	346	2.14
12	*355*	2.09
Mean	344.8 ± 8.95	2.12 ± 0.03

*Each figure is the mean of (right and left) twenty four crop-sac diametric measurements ± S.D.

Measurements:

The birds were killed on day 5. The skin was separated from the crop-sac; before it was removed and bisected. The lining of each half was rinsed with water and after removing the fat, each half was stretched against the light of a table lamp, fitted with a 100 watt bulb; while another person measured the diameter of the proliferated area in centimetres with a caliper. Since, this area appears circularly opaque, the diameter of proliferated crop gland was measured at least at three places and the average was worked out to represent the response level of each pigeon.

RESULTS

The crop-sac induction following the intradermal injections of the suspensions of ouabain treated *Uromastix* pituitaries (Bioassay, 1) showed a minimum response of 0.5 cm; a maximum

response of 0.95 and 0.90 ± 0.03 cm as the mean of 24 measurement, for each half of the 12 crop-sacs (Table 1). The untreated *Uromastix* pituitary showed a minimum crop-sac response of 2.08 cm; a maximum response of 2.16 cm and 2.12 ± 0.03 cm as the mean of right and left half of 12 crop-sacs (Table 2).

DISCUSSION

A variety of drugs can alter secretion of PRL (Ahmad *et al.,* 2001). Secretion of this hormone by the pituitary is under predominantly negative control of the hypothalamus, and in this respect it is unique among the pituitary hormones. A PRL release inhibiting hormone (PRIH) is secreted by the hypothalamus and is carried by the hypothalamo-adenohypophyseal portal system to the adenohypophysis; where it inhibits PRL secretion.

Normally, *Uromastix* pituitary shows a crop-sac response of 2.12 cm (Ahmad *et al.,* 2002). Whereas ouabain *in vivo* treated pituitary suspension of *Uromastix* showed a low response of 0.90 cm and the cause of hypoprolactinemia following the administration of pituitary suspension was due to the secretion of PRIH.

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