Effect of Dexamethasone on Mean Neuclear Diameter (Mnd) Of Interrenal Tissue in an Air Breathing Fish, Channa Punctatus (Bloch)

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Abstract: In the present work an attempt has been made to study the effect of dexamethasone (a synthetic corticosteroid) on mean nuclear diameter (MND) of interrenal tissues in an air breathing fish Channa punctatus (BLOCH). There is a significant decrease in MND of dexamethasone injected fishes (three groups each having three fishes) at the time interval of 10 days , 20 days and 45 days compare to control groups of fishes given injections of peanut oil at similar time intervals.

Keywords **- Channa punctatus, interrenal, MND, dexamethasone.**

I. INTRODUCTION

Hormones plays an important role in the physiology of fishes (Raza et. al; 2000). Several Workers have tried to demonstrate fundamental actions of adrenocortical hormones (Marinesque, 1991; Pandey et. al ;1985)in fishes obvious in higher vertebrates .Dexamethasone is a synthetic corticosteroid which is more potent than natural steroids in suppressing functions in mammals has been use to study of pituitary – interrenal relationship (Donaldson and Mc Bride 1967). Present study undertaken to determine the effect of dexamethasone on interrenal activity of Channa punctatus.

II. MATERIAL AND METHODS

Live specimens of Channa punctatus (Bloch) were procured from local fish market at Siwan Bi-har and kept in glass aquarium (60L) in the laboratory for seven days for proper acclimatization. Specimens were fed daily with pieces of goat lever laboratory maintained specimens (weight, 35±5 gm neither young or old).

Dexamethasone (merk, sharp and Dohme of Canada LTD) was suspended in peanut oil (1 mg per ml) and injected intraperitoneally. Fishes use for histological examination (1mg per kg of body weight)at interval of 10 days , 20 days and 45 days . Specimens are divided into 3 groups (each have 3 fishes). Controls groups were injected with peanut oil at similar intervals. Fishes were sacrificed to obtain their head kidney for fixation in aqueous bouin's solution. Subsequently examination of adrenocortical tissue in sections (6 µm thick) stained with hematoxylin and eosin. The cortical or inter renal cells are polymorphic. MND of 30 cells of interrenal tissues (10 cells from each of 3 fishes) was determined with the help of a calibrated ocular micro meter. The dif-ference of significance between the control and experimental animals was calculated by stu-dents''-test at the level of 5 %.

II. RESULT

The data showing the effect of dexamethasone in Channa punctatus are presented in table 1. The MND of cortical tissue of Zero time control group was 4.82 ± 0.14 µm. While that of fish re-ceived peanut oil injection during 30th day was 4.87 ±0.31 µm. The MND of control fishes which had received peanut oil on 45th day was 4.94±0.12 µm. The MND of fish which had received the same amount of dexamethasone injection was 4.37±0.05 µm at 10th day, 4.02±0.07 µm at 20th day and 3.20 ± 0.11 µm at 45th day. The Difference between the peanut oil groups either the Zero time controls or Dexamethasone treated group was statistically significant ($p < 0.05$).

Table

Water temp =29.0±1.5.C , N=3 per each group
±= S.E.M, S*= Significant at P<0.05
Body Weight = 35.0 ± 1.5 gm

S.No	Condition	Dose (mg/kg of body wt.)	MND (µm)
1.	Control	Peanut Oil	4.82± 0.14(10^{th} day) 4.87±0. 31(20^{th} day) 4.94±0.12(45^{th} day)
2.	Dexamethasone	0.05 mg	4.37±0.5* ↓
3.	Do	0.10mg	4.02±0.07 ↓
4.	Do	0.15mg	3.20±0.11* ↓

IV. DISCUSSION

Treatment of dexamethasone (a synthetic corticosteroid) caused significant decrease of interrenal tissue (as evident by significant decrease in MND) as compare to control group of fishes (Channa punctatus). In mammals dexamethasone inhibits corticotropic functions in resting to the extent that adrenal atrophy results. In present study dexamethasone treatment during period of 10th day (dose 0.05mg), 20th day (.10 mg) and 45th day (.15 mg) inhibited the continuing process of inter renal hypertrophy which normally associated with sexual maturation in Channa punctatus (BLOCH). Persistence presence of cortisol concentration similar to those found in resting fish shows that a basal cortisol level was maintained even during the period immediately following dexamethasone treatment. Increasing dose did not significantly reduce these concentrations (Robertson and Wexler, 1959; Fagerlund et al., 1968).

V. CONCLUSION

Interrenal tissues of fish Channa punctatus (Bloch) is homologous to the adrenal cortex of mam-mals that is responsible for the secretion of corticosteroids. Dexamethasone, a synthetic cortico-steroid brings significant change in MND of interrenal cells (as evident in significant decrease in MND) compared to control group of fishes. An apparent reduction in MND of interrenal cells leads to increase in number of hypertrophic cells.

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