

SHORT COMMUNICATION

EFFECT OF ESTROGEN ON LENS EPITHELIUM IN THE ALBINO RAT

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Summary: Normally in the rats under the lens capsule there is a single layer of epithelial cells extending upto the equator. The effect of estrogen on the lens epithelium is that of atrophy which may be a factor in the development of lenticular opacity.

Key words: lens epithelium estrogen atrophy

INTRODUCTION

Estrogen now a days is widely used as a constituent of oral contraceptive pills. It has also been used for the treatment of prostatic hypertrophy, oligospermia, pulmonary haemorrhage, osteoporosis, amenorrhoea, menopause, Reiters disease, atherosclerosis etc.

The effect of estrogen on the lens has been sparingly described in the literature. Paterson *et al.* (3) observed diffusion of sodium in extracellular spaces of the crystalline lens. In the present study on the eyeballs of albino rats, the effect of different amounts of estrogen on lens epithelium has been reported.

MATERIALS AND METHODS

In all 24 adult albino rats of either sex were taken for the study. 6 rats were kept as control and the rest 18 were divided into 2 groups. One group was given estrogen (Neoclinestrol) 0.05 mg intramuscular injection daily for 1 week, 3 weeks and 5 weeks and another 0.25 mg intramuscular injection for 1 week, 3 weeks and 5 weeks. The animals were killed after these intervals by cutting the internal carotid artery under deep ether anaesthesia. The eyes were enucleated and kept in Bouin's fluid for 48 hrs. These were then washed in running water for 1 hr. The eyes were then treated with graded

alcohols. The paraffin blocks were prepared and sections were cut at 5 micron thickness. All the slides were stained with haematoxylin and eosin.

RESULTS

Normal structure: In all the control rats, under the capsule a single layer of lens epithelium (Fig: 1) was observed. The cells when traced towards the equator got elongated into lens fibres.

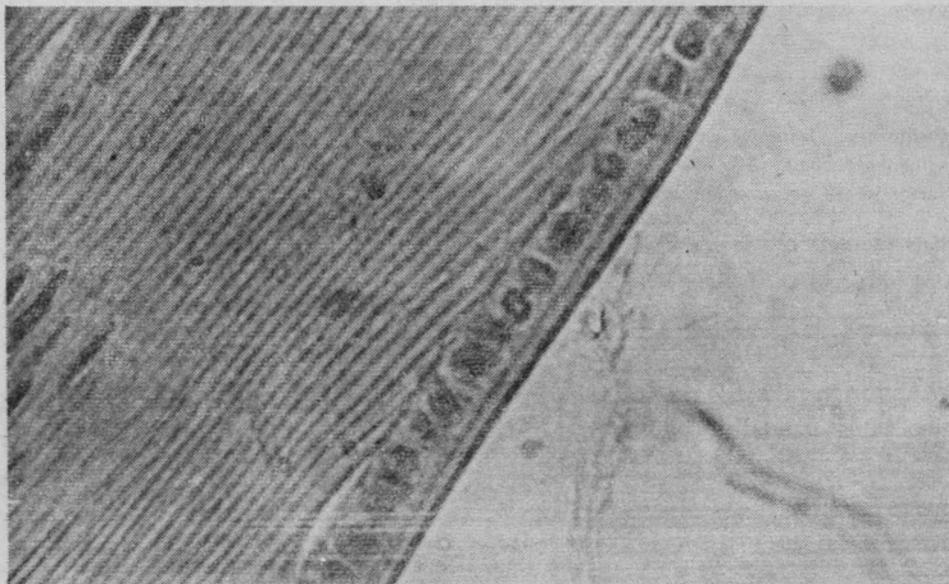


Fig. 1 : Showing the elongated epithelial cells at the arrows near the equator of the lens, x 180 HE.

Rats treated with 0.05 mg intramuscular injections of estrogen showed:

- | | | |
|---------------------|---|--|
| After 1 and 3 weeks | — | No change. |
| After 5 weeks | — | Few cells both at the centre as well as at periphery atrophied (Fig. 2). |

Rats treated with 0.25 mg of estrogen intramuscular injections of estrogen showed:

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|--------------|---|------------|
| After 1 week | — | No change. |
|--------------|---|------------|

After 3 weeks

- Few epithelial cells at the centre as well as at the periphery affected. At places cells completely atrophied leaving gaps.

After 5 weeks

- Iris adherent to the anterior surface of lens. All cells showed atrophic changes. These cells took weak staining.

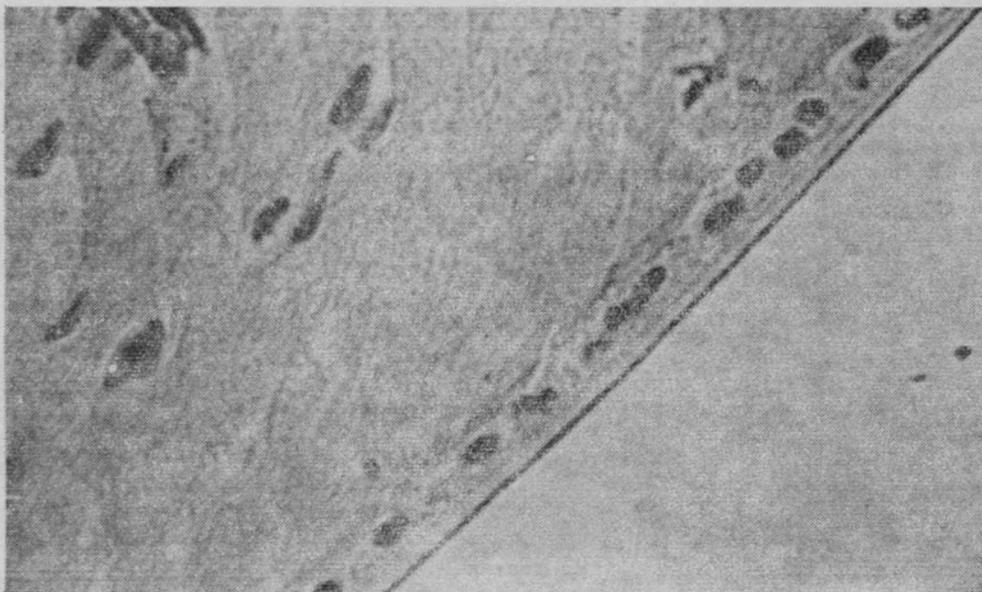


Fig. 2 : Showing the atrophied columnar cells at the arrows near the equator of the lens, x 180 HE.

DISCUSSION

Prince *et al.* (1) described that the lens as a whole in mouse is almost spherical and not lenticular. Wolff (2) commented that the general structure of the lens is the same in all vertebrates.

The effect of many drugs like methotrexate, adrenaline, pilocarpine, thioacetamide etc. on the lens epithelium has been described in the past literature. The lenticular epithelium has even been described to show changes in the mitotic activity in different environmental conditions and with age.

The estrogen alone and in combination with other hormones is extensively used now a days either for treatment or as contraceptive measure. In this study, estrogen showed definite changes in the lens epithelium. It was found that with low dose of estrogen for longer duration few cells of epithelium were atrophied. In higher dosage no change was observed initially but on increasing the duration in all the animals, the cells showed atrophic changes. The effect of estrogen on lens epithelium for longer duration may be a causative factor in the formation of lenticular opacity.

REFERENCES

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