

Effect of the Administration of Lysergic Acid Diethylamide (LSD) on the Colloid Vesicles of the Pars Intermedia of the Toad Pituitary

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ABSTRACT. The administration of LSD increases the number of colloid vesicles in the pars intermedia of the toad pituitary. As the drug increases the melanocyte-stimulating

potency of the intermediate lobe, the present findings are interpreted as additional evidence that the vesicles represent stored hormone. (*Endocrinology* 75: 615, 1964)

IN PREVIOUS papers, histophysiological (1) and histochemical (2) observations were presented suggesting that the periodic acid-Schiff-positive acidophilic colloid-like vesicles, located in the *Bufo arenarum* pars intermedia cells adjacent to the pars nervosa, might represent the morphological evidence of stored melanocyte-stimulating hormone (MSH). It has been demonstrated (3) that administration of LSD blocks the release of MSH, but not the synthesis of the hormone, in *Xenopus laevis*. In this species, as well as in *Bufo arenarum*, skin "bleaching" can be observed after LSD administration (4, 5); if a similar mechanism, involving blockage of the release of the hormone, occurs in both species, and if the colloid vesicles represent stored MSH, these would increase after LSD administration.

Materials and Methods

Twenty normal adult male *Bufo arenarum* Hensel (winter toads) were used. Ten animals were injected daily intraperitoneally with 0.1 mg of D-lysergic acid diethylamide (Delysid, Sandoz) for 10 days; the others were injected with saline and served as controls. Both treated and control animals were kept in darkness in the same cage at room temperature and adequate humidity. One day after the last injection the toads were decapitated and their pituitaries were fixed in

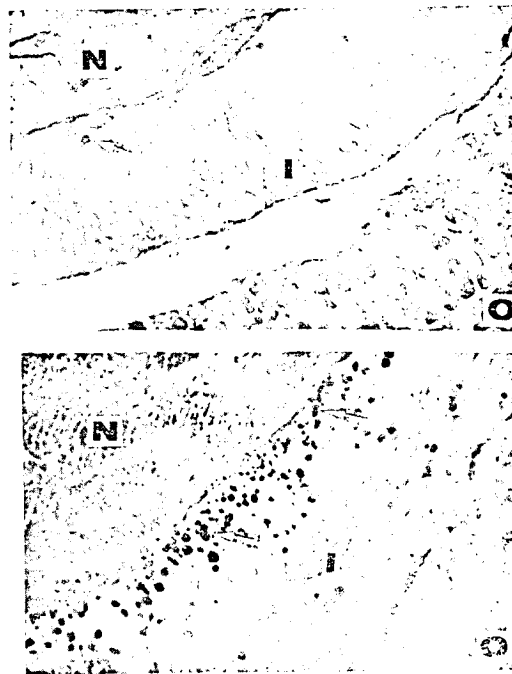


FIG. 1. and 2 (200 X). FIG. 1 (top). Pituitary of a saline-injected toad kept in darkness for 10 days; colloid vesicles are scarce. FIG. 2 (bottom). Pituitary of an LSD-treated animal maintained in the same condition as the one in Fig. 1. Greater population of colloid vesicles can be observed. O, pars distalis; I, pars intermedia; N, neurohypophysis. Arrows point to colloid-like vesicles.

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TABLE 1. Mean number of colloid vesicles found in a single whole medial sagittal section of control and LSD-treated animals

Group	No. of animals	No. of vesicles (mean)	SE
Untreated (saline-injected)	10	51	9
LSD-treated	10	980	30

Bouin's fluid, embedded in paraffin, sectioned at 5 μ and stained with PAS-orange G. Quantitative estimation of the colloid content was performed by counting the total number of colloid vesicles found in a single whole medial sagittal section from each animal.

Results

The LSD-treated animals showed a great increase in the number of colloid vesicles (Table 1). In Fig. 2 the increase of vesicles in treated animals as compared with the controls (Fig. 1) is evident. The diameters of the vesicles were not measured. In treated animals, however, the majority of the vesicles

seem to be smaller (2-9 μ) than those in the controls (4-15 μ).

Discussion

LSD increases the number of colloid vesicles in the pars intermedia of the toad pituitary. As it has been established that the drug increases the MSH potency of the intermediate lobe (3), the present findings are interpreted as additional evidence that the vesicles represent stored MSH.

Acknowledgment

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