

Maintenance of Growth Hormone Releasing Activity in the Hypothalamus of Long-Term Hypophysectomized Rats

In a previous paper¹ we studied the influence of aging on the concentration of growth hormone (GH) releasing activity. The aim of this research was to establish whether and to what extent GH-stimulatory activity was changed in long-term hypophysectomized (Hypx) animals in comparison with intact controls of the same age. For this purpose the concentration of GH-releasing factor (GHRF) in stalk median eminence (SME) extracts was determined both in long-term Hypx and in intact controls of the same age.

Materials and methods. Three groups of female Sprague-Dawley rats were used: a group of 'old' animals, donors of SME; a group of 'recipient' animals, injected with extracts of SME into the carotid artery (i.c.); and, finally, a group of 'assay' animals, injected i.p. with homogenates

Groups C, D, E, and F show the evaluation of GH potency of the homogenates from animals which received i.c. the SME extracts from both intact or Hypx 'old' animals. It is apparent that a significant reduction of GH potency has been obtained in each of the 4 groups.

The comparison between the effects of the injection of SME taken from intact or Hypx 'old' animals shows no relevant differences.

The reported data point to the fact that the GH-releasing activity still present in 1-year-old animals is practically not modified by a long-term hypophysectomy period. A concentration of GHRF in the hypothalamus of Hypx 'old' rats, which appears to be similar to that present in intact 'old' animals, does not exclude the possibility that in the Hypx animals GHRF secretion may be even higher than in unoperated controls. This hypothesis seems to be supported by the observation² that the corticotropin releasing factor is present in plasma of Hypx rats, while absent in plasma of intact animals³.

Growth hormone (GH) potency (tibia test) of pituitaries of 'recipient' rats untreated or treated with extracts of stalk median eminence (SME) taken from intact or hypophysectomized (Hypx) 'old' animals

Experimental group	'Old' rat donors of SME		SME 'recipient' rats		Material injected into 'assay' animals			No. of 'assay' animals	Tibial epiphyseal width (micra: mean \pm S.E.)
	No.	Type	No.	No. of SME injected i.c.	Saline (ml)	Pituitary homogenates (mg/day/4 days)	Standard GH (μ g)		
A	—	—	—	—	0.5	—	—	8	163.2 \pm 4.7
B	—	—	5	—	0.5	0.625	—	8	310.2 \pm 5.5
C	3	Intact	5	1/2	0.5	0.625	—	8	257.8 \pm 3.9
D	5	Intact	5	1	0.5	0.625	—	8	225.5 \pm 5.7
E	5	Hypx	10	1/2	0.5	0.625	—	16	261.4 \pm 7.1
F	10	Hypx	10	1	0.5	0.625	—	16	230.2 \pm 6.9
G	—	—	—	—	0.5	—	30	8	255.3 \pm 5.9
H	—	—	—	—	0.5	—	60	8	312.4 \pm 7.6

Average epiphyseal values of groups C, D, E and F are significantly different from that of group B ($p < 0.001$). The differences between groups C-E and D-F are not significant.

of pituitaries taken from 'recipient' animals. The 'old' animals, intact or Hypx when 40 days old, were kept for 1 year. The SME of 8 intact and 15 Hypx rats were removed, pooled by groups, and extracts were prepared as previously indicated¹; they were injected i.c. into 40-day-old intact 'recipient' animals, each of which received (in 0.2 ml) the extract corresponding to 1 or 1/2 SME taken either from intact or from Hypx 'old' rats. After 15 min the 'recipient' rats were killed and their pituitaries were removed. GH potency of pituitary homogenates was tested on 'assay' animals using the tibia test method¹. As reference standard, bovine GH (GH-B9), supplied by NIH Endocrinology Study Section, was used.

Results and discussion. The results are presented in the Table. 'Assay' animals treated only with saline (group A) present an average epiphyseal width of 163.2 micra. When pituitary homogenates from 'recipient' control animals were injected i.p. in 'assay' animals (group B), a remarkable enlargement of epiphyseal width (310.2 micra) was noticed.

Riassunto. In animali ipofisectomizzati da un anno l'attività somatotropa liberatrice degli estratti di eminenza mediana dell'ipotalamo si è dimostrata simile a quella di analoghi estratti ottenuti da animali normali della stessa età.

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¹ A. PECILE, E. MÜLLER, G. FALCONI, and L. MARTINI, *Endocrinology* 77, 241 (1965).

² A. BRODISH and C. N. H. LONG, *Endocrinology* 71, 298 (1962).

³ Acknowledgment: This investigation was supported by PHS research grant HD 01109-01 from the Child Health and Human Development Institute, Public Health Service, U.S.A.

⁴ The authors wish to thank Mr. H. PENTES for the revision of the manuscript.