

Amylase Activity in Laboratory Animal Serum and Tissues

Amylase levels have been determined in the serum of several animals (rat, mouse, guinea-pig, rabbit, cat) and man by the method of WOHLGEMUTH^{1,2}. In rat (17 animals), mouse (11) and guinea-pig (13), after a 12 h fast, the amylase activity was about the same, namely 270-300 diastase units (DU) for 1 ml of serum; in cat (6) it was 220 DU, in rabbit (15) 22 DU and in man (6 persons) 10-20 DU for 1 ml of serum.

In 18 rats, kept fasting for 12 h before the experiment, the amylase of submaxillary and sublingual glands was found to be about 20 times higher than that of serum (average = 7224 ± 1100 DU for 1 g of tissue); in parotid glands, amylase was more than 1000 times higher than that in serum and more than 50 times higher than that in submaxillary and sublingual glands (average = $362,000 \pm 54,000$ DU for 1 g of tissue).

In liver, amylase was about 40 DU for 1 g. After a 48 h fast, the amylase level in rats (14) was lower than after a 12 h fast, but the ratio between the respective data of the two groups was the same. In 12 h fasted rats (14), operated on 6 days before for removal of the salivary (submaxillary, sublingual and parotid) glands, the serum and the liver amylase were about the same as in non-operated rats.

The data reported here are not entirely in agreement with the results of SCHNEYER and SCHNEYER³, according to whom amylase activity of submaxillary and sublingual rat glands (as in our experiments, the small sublingual lobe was not separated from the submaxillary gland) is sig-

nificantly lower - approximately between 3-9% (only occasionally 50%) - than that of the serum and also lower than that of the liver.

In 19 rats, hepatectomized 42 h before through surgical removal of 65-75% of the hepatic parenchyma⁴, and 12 h fasted, the serum amylase was the same (13 rats) or only a little lower (6 rats) than that of control rats not hepatectomized.

These results suggest that serum amylase levels, at least in the rat, do not depend on the salivary glands or the liver; therefore in the rat, the serum amylase also seems to be chiefly from a pancreatic source.

Riassunto. Si è studiato il tasso amilasico nel siero di vari animali, nonché nelle ghiandole salivari e nel fegato di ratto. L'amilasi sierica non varia significativamente nel ratto privo delle ghiandole salivari o di 2/3 del fegato.

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¹ V. CALABI and L. GALLONE, *Accertamenti di laboratorio in clinica* (Redi ed.; Milano 1954), p. 388.

² A. E. RAGGIO GUARNESCHELLI and D. GIGANTE, *Analisi cliniche* (Il pensiero scientifico, Roma 1961), vol. I, p. 260.

³ C. A. SCHNEYER and L. N. SCHNEYER, *Am. J. Physiol.* 198, 771 (1960).

⁴ G. M. HIGGINS and R. M. ANDERSON, *Arch. Path.* 12, 186 (1931).

LEÃO's Spreading Depression in the Thalamic Nuclei of Rat

The cortical spreading depression (SD) of LEÃO¹ was recently described in different cortical and subcortical structures (hippocampus, striatum, cerebellar cortex, amygdala - MARSHALL², BUREŠ³, OCHS⁴, FIFKOVÁ⁵, FIFKOVÁ⁶). Continuity of grey matter seems to be a necessary prerequisite of SD which does not penetrate across compact white matter bands. The purpose of the present paper was to answer the question whether it is possible to evoke SD in a non-homogeneous structure, divided by the white matter laminae into a number of nuclei, typically represented by the system of thalamic nuclei.

Slow potential changes, used as the main indicator of SD, were led off with saline filled capillaries (300 μ) connected to wick calomel cell electrodes. The steady potential change was recorded with a six-channel recording millivoltmeter. SD was elicited by intracerebral micro-injection of 0.5 μ l of KCl (25% solution). In 7 rats the injection needle was introduced to thalamic points +2.5, 2, 5.5 and 7.5, while three glass capillaries (with 1 mm intercapillary distance) were inserted into the same frontal plane (+2.5) 5-7 mm deep. In another group of 9 rats, the injection needle and one capillary electrode were introduced into the right thalamus (+2.5, 2, 5.5 and +2.5, 1, 5 respectively). On the left side, an array of three capillaries connected with the second injection needle

was inserted in the parasagittal plane 1.5-2.5 mm from the midline. Whereas the depth of the electrode system on the right side was not changed during the experiment, capillaries in the left hemisphere were inserted in 2-3 one-millimeter steps (Figure). The location of the electrode positions was checked in Nissl stained sections.

Characteristic SD waves could be elicited in this way from different thalamic loci. The average amplitudes of the slow negative waves obtained from these structures and their average duration calculated to 50% of maximum negativity are summarized in the Table. The spreading velocity was 2.42 ± 0.21 mm/min ($n=96$). No spread of thalamic SD was found to hypothalamic regions, neither could SD be elicited by KCl injection into the hypothalamus (area hypothalamica lateralis). In the capsula interna adjacent to the lateral part of thalamic nuclei, low waves of negativity attaining not more than 3 mV could be registered. Significant decrease in the slow potential change amplitude was found between the groups of midline and medial nuclei and the lateral and

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² W. H. MARSHALL, *Physiol. Rev.* 39 239 (1959).

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⁴ S. OCHS, *Int. Rev. Neurobiol.* 4, 1 (1962).

⁵ E. FIFKOVÁ, J. BUREŠ, O. CH. KOSHTOYANTS, J. KŘIVÁNEK, and T. WEISS, *Exper.* 17, 1 (1961).

⁶ E. FIFKOVÁ and J. SYKA, *Exp. Neurol.* 9, 355 (1964).