

progressive course of Huntington's chorea or of chorea minor during a rheumatic attack. This suggests that our experiments reproduced a particular stage in the pathogenesis of those diseases. Moreover, the procedure we employed makes it possible to control the course of pathological events and is convenient to use in the testing of therapeutic agents.

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Effect of Reserpine on the Parameters of Rat Grooming Behavior

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UDC 576.2:591.574:615.717

Translated from *Byulleten' Experimental'noi Biologii i Meditsiny*, Vol. 115, No. 1, pp. 10-11, January, 1993
Original article submitted July 21, 1992

Key Words: grooming; graphic recording; reserpine

The pharmacological approach in studying the neuronal mechanisms of grooming behavior (*i.e.* specialized reflexes for skin cleaning) is widely used [9]. In this investigation reserpine (a neuroleptic agent) was used for such a purpose. It is known that the use of reserpine has led to fundamental discoveries in studies of the mechanisms of action of the monoamines (MA). Reserpine depresses the active transport of MA, and in particular of dopamine

(DA), into vesicles, and prevents the formation of norepinephrine (NE) from DA. The resulting deficiency of the transmitter depresses the effects of the central and peripheral adrenergic structures [2, 7, 11]. The typical symptoms of reserpine action are as follows: a decrease of locomotor activity, an increase of muscle tonus, and tremor in the case of systematic administration of the drug [10].

In studies of the neuronal mechanisms of grooming with the use of pharmacological agents, the graphic recording of grooming [1] opens up wide possibilities for an objective estimation of all the parameters of the different movements of which grooming consists.

MATERIAL AND METHODS

The study was performed on 10 adult albino male rats, aged two months, which were allowed to move freely. The motor activities of both the intact and experimental rats, which were placed in different actographs, were

Table 1. Effect of reserpine on the grooming behavior of rats.

Kinds of groomi	Variation of grooming parameters, %					
	number			duration, sec		
	Days of injection					
	1	2 - 3	4 - 5	1	2 - 3	4 - 5
washing	+40	+50	-40	-	+71	0
licking	-50	+30	-100	-63	+150	-
biting	-90	+250	-80	-50	+240	0
scratching	-63	+133	-62	-16	+21	0
shaking off	-55	+515	+1075	0	+75	+150

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recorded simultaneously on the electroencephalograph for 1 hour or longer. Reserpine (2.5 mg/kg of weight) was systematically injected intraperitoneally during 5 days. Intact animals were injected with the same volume of saline. The motor activity was recorded 3 hours after injection because the maximum release of endogenous catecholamines (CA), initiated by reserpine, takes place in adult animals 4 hours after treatment [6].

RESULTS

The investigation showed that the action of reserpine on rat grooming behavior has three phases, or periods, which were clearly manifested. The first period (first day of reserpine injection) is characterized by the inhibition of nearly all kinds of grooming (except washing). During the second period (second and third days of reserpine injection) all movements of grooming were activated. The third period (fourth and fifth days of reserpine injection) is characterized by the appearance of tremor and of numerous shaking-off movements, but all other kinds of grooming are inhibited (Table 1, Fig. 1).

It is of interest to compare these changes in grooming with what has been described in the literature concerning the mechanism of reserpine action. This may help elucidate the mechanisms, of grooming regulation. According to published data the first period can be considered as the reserpine-induced release of endogenous CA, which begins some hours after reserpine is injected [6]. Observations where clonidine caused the activation of the NE-ergic receptors, followed by the inhibition of stereotyped behavior [3, 11], are indicative of the elevated level of endogenous NE as being the inhibitor of grooming in this period. On the third day the main adrenolytic effect of the central action of reserpine comes into evidence most clearly. The activation of grooming during this period supports the suggestion that the central adrenergic structures inhibit grooming.

The appearance of tremor in the third period is evidence of a decreased level of DA in the extrapyramidal system. The Parkinson syndrome evoked by reserpine (tremor, rigidity, akinesia) is described in the literature as being the result of the systematic injection of reserpine, which decreases the nigral inhibition on the striatum realized by means of DA [4, 8].

The analysis of the graphs of grooming movements of the intact and reserpine-treated rats showed that on the first day of reserpine injection (first period), parallel with the inhibition of all grooming movements (except washing), the curtailment of all movements can be observed. The washing movements even lose their rhythmic character and are limited to one short washing movement. In the second period of reserpine action (second and third days of injection) in addition to the activation of all movements of grooming, an increase in their duration is noted. During this period, the movements start combining into complexes of three or four

movements. Several shaking-off movements can merge into one prolonged movement. Besides, so-called "chains" appear that consist of alternating movements of licking or biting the fur which last up to 2 minutes. The third period is characterized by the appearance of tremor and of a large number of forceful, prolonged shaking-off movements. The few remaining grooming movements of other types become isolated again, and "chains" of movements are no longer observed. During this period, the rats stand on their hind legs for a long time, and they sleep and scratch in the standing position.

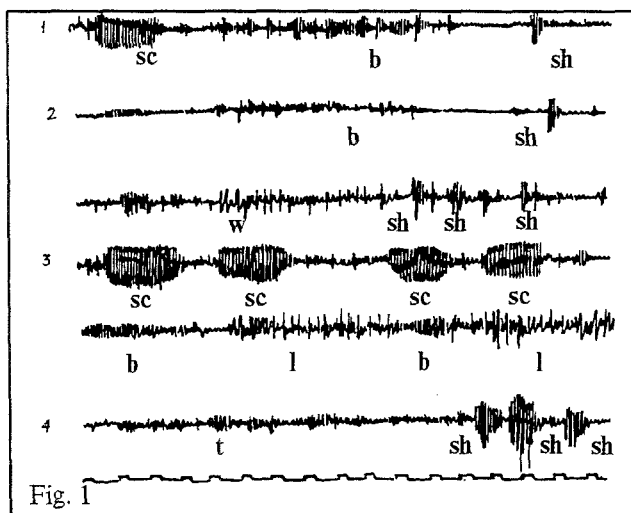


Fig. 1. Effect of reserpine on grooming behavior of rats. 1) grooming of an intact rat; 2) first day of reserpine injection; 3) third day of reserpine injection; 4) fifth day of reserpine injection. b - biting, l - licking, sh - shaking off, w - washing, sc - scratching, t - tremor. Time scale 1 sec.

This is one of the manifestations of muscle rigidity. The data from the literature indicate that the stereotyped behavior is inhibited by the NE-ergic influences and activated by the DA-ergic influences [5, 10, 11]; if this is so, the shaking-off movements can be inhibited by an increase of both the NE- and DA-ergic actions.

Reserpine does not have a specific effect on the frequency of grooming movements of adult rats. It must be taken into account, that the CA-ergic regulation of stereotyped movements has been shown so far only for gnawing and sniffing. In this article the regulation of stereotyped movements of grooming has been considered. The further elucidation of the specific regulation of different grooming movements calls for a detailed pharmacological analysis.

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0007-4888/93/0001-0010\$12.50 ©1993 Plenum Publishing Corporation

Myoelectric Duodenogastric Dyskinesia during Pentagastric Ulceration

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UDC 616.33-002.44-092.9-02:615.357:577.175.722]-07.

Translated from *Byulleten' Experimental'noi Biologii i Meditsiny*, Vol. **115**, No. 1, pp. 11-13, January, 1993
Original article submitted July 5, 1992

Key Words: *pentagastrin; ulcer; duodenogastric dyskinesia; myoelectric activity*

It is known that gastrin is one of the main stimulating agents of the gastric secretory function [1, 3-5] and that pentagastrin administered in high doses [4, 7] may cause gastric ulceration. It is also known that ulceration is found in various types of hypergastrinemia, including the Zollinger-Ellison syndrome. It has been demonstrated that pentagastrin may both stimulate and inhibit motor and myoelectric gastrin and intestinal activity. However, the role of gastrin in the coordinated activity of the stomach, pyloric sphincter, and duodenum remains obscure.

The purpose of this presentation was to study the relationship between the myoelectric activity of the

stomach, pyloric sphincter, and duodenum for the ulcerogenic effect of pentagastrin.

MATERIAL AND METHODS

Chronic experiments were conducted on 5 male rabbits weighing from 2.5 to 3.3 kg. Silver loop electrodes were implanted in the smooth muscles of the stomach, pyloric sphincter, and duodenum according to the method described earlier [8] one to two weeks before the experiments. The gastropyloduodenal activity was recorded by myoelectrography at the rate of 7.5 mm per second, the time constant being 0.3. The rabbits were on the conventional diet (oats, vegetables, hay). The experiments were conducted in the morning; no preliminary dietary restrictions were used. Pentagastrin (Sanitas) was injected subcutaneously during 5 days in ulcerogenic doses [4,7] of 0.2 mg/kg daily. Gastropyloduodenal electromyoelectrography was used to evaluate both the sequence of action potential series one hour before and after injection. The myoelectric activity of the duodenum was compared with that of the stomach before and after pentagastrin administration. Macroscopic evaluation of the destructive lesions of

TABLE 1. Frequency of Gastroduodenal Action Potential Series at the Beginning and End of Pentagastrin Effect ($M \pm m$)

Area studied	Frequency of action potential series, 1/min		
	Background	Beginning	End
Gastric fundus	2,9±0,3	3,2±0,8 (+10%)	1,7±0,5* (-41%)
Pyloric sphincter	2,0±0,3	3,0±0,9* (+50%)	1,5±0,5* (-25%)
Duodenum	13,2±1,9	21,0±1,0 (+59%)	20,8±1,0* (+57%)

NOTE: * - the difference is reliable ($p < 0,05$) as compared to the background.