

Summary. A decrease in the amounts and numbers of free amino acids determinable by paper chromatography is associated with prostatic atrophy after castration. Replacement therapy in the castrated animal is followed

by a progressive increase toward normal. The relation of these findings to growth processes is briefly discussed.

Received July 28, 1949. P.S.E.B.M., 1949, 72.

The Electroencephalogram in Parkinsonism. (17342)

HENRY NEWMAN, ROBERT McNAUGHT, AND FRANCIS O'DONNELL.

From the Departments of Medicine and Surgery, Stanford University School of Medicine, San Francisco, Calif.

It is generally recognized that the pathological process in Parkinsonism centers about the basal ganglia. The electrical activity of this region was studied by Meyers and Hayne¹ by direct insertion of insulated electrodes. They found normals to have a striatal rhythm faster than that of the cortex, while patients with Parkinsonism showed sequences of 25 cycle rhythm not recorded from the cortex. Spiegel² found the potentials from the cat's thalamus to be much like those from the cortex. Using an electrode driven into the sphenoidal bone Grinker and Serota³ found 4 to 6 cycle waves as well as alpha rhythm. Using nasopharyngeal electrodes, Barnett⁴ failed to find any 4 cycle activity.

Using conventional scalp electrodes, Yeager and Baldes⁵ reported 4 cycle waves not synchronous with the tremor in patients with Parkinsonism. Jasper and Andrews⁶ found no slow waves in two patients with unilateral Parkinsonism, but did record such activity from 2 patients with advanced bilateral disease. They concluded that the slow activity was present in cortical leads only when tremor was bilateral. Schwab and Cobb⁷ recorded

similar potentials from patients with Parkinsonism, but were of the opinion that the slow waves were artifacts from head movement, since they were able to suppress them by mechanically restraining the head. In view of these conflicting opinions, it seemed worth while to investigate the problem further.

The basal leads which we employed consisted of silver cannulae, insulated save at the tip with bakelite varnish, which were inserted, after topical cocainization, through the nostrils and into the sphenoidal sinuses, where the tips lay against the posterior wall. X-ray examination showed the tips to be in close proximity to the floor of the sella turcica in the majority of cases. In addition to the two sphenoidal leads, scalp electrodes of hypodermic needle type⁸ were placed on each side in the frontal, central, and occipital regions, and the two mastoid regions were grounded. The potentials were amplified by a Grass 4 channel electroencephalograph. Recordings were made between the two sphenoidal electrodes, as well as between the sphenoidal electrodes and the pairs of scalp electrodes. Unipolar recordings from the sphenoidal and scalp electrodes were also made.

In general, where both sphenoidal electrodes made good contact, which occurred about half the time, the intersphenoidal potentials resembled most those recorded from the central scalp electrodes, showing mostly 20 cycle ac-

¹ Meyers, Russell, and Hayne, Robert, *Trans. Am. Neurol. Assn.*, 1948, p. 10.

² Spiegel, E. A., *Am. J. Physiol.*, 1937, **118**, 569.

³ Grinker, R. R., and Serota, H., *J. Neurophysiol.*, 1938, **1**, 573.

⁴ Barnett, A., *J. Lab. and Clin. Med.*, 1941, **26**, 1659.

⁵ Yeager, E. L., and Baldes, E. J., *Proc. Staff Meet. Mayo Cl.*, 1937, **12**, 705.

⁶ Jasper, H. H., and Andrew, H. L., *J. Neurophysiol.*, 1938, **1**, 87.

⁷ Schwab, R., and Cobb, S., *J. Neurophysiol.*, 1939, **2**, 36.

⁸ Newman, H. W., *Stanford Med. Bull.*, 1949, **7**, 61.

tivity of low voltage, with some 10 cycle waves. The potentials recorded between the sphenoidal electrodes and the scalp electrodes corresponded to those secured from the corresponding scalp electrode and ground. Thus there were no waves felt to be characteristic of the sphenoidal leads.

Records were secured from 12 patients with Parkinsonism. Of these, 6 were incidental to cerebral arteriosclerosis and 6 were post-encephalitic. Nine showed gross tremor, bilateral in all cases. Of these patients with tremor, 5 showed no evidence of slow activity on the EEG, either from the sphenoidal or the scalp leads. The remaining 4 showed slow activity, all of them from the sphenoidal leads, and 3 from one or more scalp leads as well. Fig. 1 shows the 4 cycle activity recorded from the sphenoidal and frontal leads in one of these patients, and its disappearance on opening the

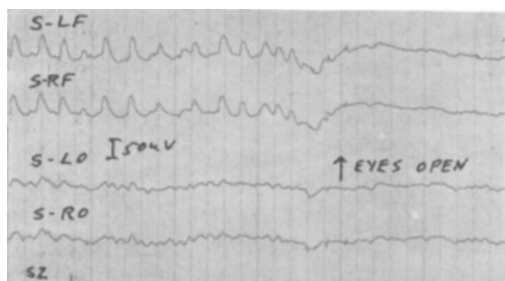


FIG. 1.

Disappearance of 4 cycle activity on opening the eyes in a patient with Parkinsonism. The electrode placement is S-LF, sphenoidal to left frontal; S-RF, sphenoidal to right frontal; S-LO, sphenoidal to left occipital; S-RO, sphenoidal to right occipital.

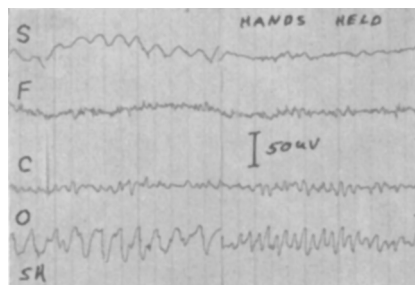


FIG. 2.

Disappearance of 4 cycle rhythm on mechanical restraint of the hands in a patient with Parkinsonism. The electrode placement is S, sphenoidal; F, frontal; C, central, and O, occipital, all bipolar.

eyes, indicating that it was due to eye movement incidental to the tremor. Fig. 2 shows 4 cycle activity in another patient from the sphenoidal and occipital leads, and its disappearance when the patient's hands were restrained.

In the one patient who showed slow activity from the sphenoidal leads but not from the scalp leads it is a little more difficult to dismiss the slow rhythm as artifact, but since it too was suppressed by mechanical restraint it seems reasonable to ascribe it to head movement.

In none of the 3 patients who had no gross tremor was any slow activity demonstrated from either the sphenoidal or scalp leads.

Summary. Patients with Parkinsonism do not show slow activity in the EEG, using either sphenoidal or scalp electrodes, except that incidental to movement artifact.

Received August 1, 1949. P.S.E.B.M., 1949, 72.

Blood Level of Sodium 1-Methyl Butyl Barbituric Acid and Duration of Anesthesia in Rabbits. (17343)

LEO R. GOLDBAUM AND JEROME A. SCHACK (Introduced by Maurice Landy.)

From the Army Medical Department Research and Graduate School, Army Medical Center, Washington, D.C.

Since the report of Koppányi, *et al.*,¹ on the barbiturate-cobalt reaction extensive investi-

¹ Koppányi, T., Murphy, W. S., and Krop, S., *Proc. Soc. Exp. Biol. and Med.*, 1933, 30, 542.

gations of the metabolic fate of the barbiturates have taken place. The recent development of an ultraviolet spectrophotometric method utilizing small samples of blood has