ANALYSIS OF MORE THAN 200 CASES OF EPILEPSY
TREATED WITH LUMINAL.*

By DR. C. C. KIRK,

*Superintendent, Arkansas State Hospital for Nervous Diseases;
Professor of Nervous and Mental Diseases,
University of Arkansas.*

Epilepsy is always interesting in that the pathology of the disease is as yet unknown, and the manifestations are not always the same. Many object to the word epilepsy and prefer to speak of the epilepsies. Certainly convulsions occur in arteriosclerosis, hysteria, nephritis, certain forms of heart disease, many types of neuro-syphilis, multiple sclerosis, brain tumor, rabies, tetanus, alcoholism and strychnin poisoning, but these do not mean that they are genuine epilepsy. They are symptomatic of certain somatic changes. It really does not matter whether it is a disease entity or whether it is a syndrome, and it does not matter much whether it is spoken of as epilepsy or as the epilepsies. It is not the purpose of this paper to discuss the pathology or etiology of epilepsy. In our treatment of epilepsy we have not had under treatment any of the so-called symptomatic epilepsies, but we have had under treatment the idiopathic or essential epilepsies with the exception of one case of traumatic epilepsy.

Two thousand years ago Hippocrates recommended general hygienic measures in the treatment of the epilepsies. Perhaps our understanding and application of general hygienic measures are a little better than they were in the day of Hippocrates. Physicians who are familiar with the treatment of epilepsy always impress upon the patient and nurses the importance of diet. Indiscretion in diet probably produces more seizures than any other one thing. Next in importance is bowel elimination. Of course, other methods of elimination, occupation, fresh air, etc., are certainly necessary in the armamentarium in combating epilepsy.

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Epilepsy is regarded as almost a hopeless condition. Craig Colony for Epileptics shows 92 patients recovered out of more than 5000 treated, and these 92 have only been clear of seizures for two years, and it is probable that a certain number of these 92 will eventually have a recurrence of their disease if they continue to live any length of time.¹ The 175,000 epileptics in the United States and their friends, besides the entire medical profession, have been grasping at straws in the way of treatment. Much damage has been done in the past as the result of fraudulent remedies that were advertised through the newspapers and other sources. They created a false hope in the mind of the epileptic, which eventually resulted in greater pessimism, less hope and a feeling of despair in the minds of those who have been striving for relief from this strange and mysterious malady. For many years the medical profession has depended almost entirely on bromides in the treatment of this disease, but relief from bromides is often incomplete, and the objections to their prolonged administration are so well known that I shall not undertake to discuss them in this paper. Many physicians reject their use entirely.

LUMINAL.

Actions and Uses.—It is claimed that the introduction of the phenyl group increases the hypnotic power of Luminal (phenobarbital) over that of barbital.

Luminal is said to produce sleep in the cat and dog with a satisfactory range between the effective and lethal doses, affording a deep, quiet sleep, without injury to the respiration or circulation. Very rarely a period of excitement preceded sleep.

It has a sedative action on respiration, lessening the frequency of breathing, although the volume of each respiration is increased. It kills by respiratory paralysis. It is eliminated by the kidneys, a certain portion being probably decomposed in the organism. No renal injuries or gastric disturbances have been observed.

Luminal is claimed to be a useful hypnotic in nervous insomnia and conditions of excitement of the nervous system.

Dosage.—From 0.2 to 0.3 gm. (3 to 5 grains) increased if necessary to 0.8 gm. (12 grains). A maximum dose of 0.8 gm.

¹ Annual report Craig Colony for Epileptics, January, 1920.

(12 grains) should not be exceeded. Smaller doses are sometimes efficient.

LUMINAL-SODIUM.

DOSAGE.—For hypodermic injection Luminal-sodium is used in the form of 20 per cent solution, prepared by dissolving the salt in boiled and cooled distilled water; 2 c. c. (30 minims) of the solution contain 0.4 gm. (6 grains) of Luminal-sodium. The dose of Luminal-sodium is ten per cent greater than that of Luminal.

Luminal-sodium may be given hypodermically in doses of 0.1 to 0.3 gm. ($1\frac{1}{2}$ to 5 grains).

The use of Luminal in the treatment of epilepsy in the United States was comparatively unknown until after the war. Luminal is a German product and was used by the Germans in the treatment of epilepsy in 1912. Grinker³ says that Luminal was prepared in 1911 and given to the medical profession in 1912-13 by the Germans. He states that he began the use of this drug at that time, but after the beginning of the war was unable to secure Luminal. Dercum made the first report of the use of Luminal in the treatment of epilepsy in the *Therapeutic Gazette* September 15, 1919. He states that his attention was first called to the use of Luminal in the treatment of epilepsy in July, 1914, by Dr. Richard Eager of the Devon County Asylum, Exminster, England. He claimed remarkable results even in the most confirmed epilepsies. He did not report any specific number of cases, but said the abolition of the convulsive seizures had not only extended over several months but even over several years, and that the efficacy of the drug proved most remarkable in the essential and what was formerly termed idiopathic epilepsy. He said that Luminal acted as a specific in certain cases.

The use of Luminal in the treatment of epilepsies in the Arkansas Hospital for Nervous Diseases was instituted with considerable skepticism and only with the hope of controlling the seizures and not with the expectation of a cure of the disease. On December 8, 1919, we selected as cases to be treated a certain number of patients whose seizures were the most frequent and the most severe, some of whom had been bed ridden for weeks, months and

³ Paper read before American Medical Association, New Orleans, May, 1920.

even years. We felt that if Luminal would improve the condition of these patients we would then be justified in proceeding in the treatment of milder cases. The results in certain cases were so startling and so remarkable that within thirty days all cases of idiopathic epilepsy were placed under treatment. Our method of treatment consisted of $1\frac{1}{2}$ grains of Luminal at bed time. Luminal was prepared in tablet form. After about sixty days our supply of Luminal was exhausted and it was necessary to use Luminal-sodium. The Luminal-sodium seemed to be as effective as the Luminal. At no time did we notice complaint on the part of the patient of being dizzy or heavy with this dosage. Within a few days we noticed a change in the number and severity of the seizures of the patients who were under treatment. We did not increase the dosage except in five instances. In these particular cases we used $1\frac{1}{2}$ grains of Luminal or Luminal-sodium night and morning, and in two instances we used it three times per day, but after the seizures were under control we then resumed our old method of $1\frac{1}{2}$ grains at bed time.

On May 1 our supply of Luminal and Luminal-sodium was exhausted with the exception of a small quantity which we reserved for the use of serial cases and cases of status epilepticus. Within a few days after our supply of Luminal was exhausted there was a very noticeable increase in the number and severity of seizures, but this was not equal to the conditions as they existed previous to the treatment and up to the present time, May 26, 1920. We cannot agree with one writer who claims that the seizures were more severe and more frequent than ever before.

All stimulants, tea, coffee, tobacco, were prohibited. No change in the diet was made except a closer supervision was made over the diet of the patients in regard to the quantity of food eaten. You are all familiar with the tendency of the epileptic to gormandize. We learned that many of our patients were secreting food in their clothing while in the dining room and eating it after going to their rooms. This particular feature caused us considerable trouble for a time after the treatment was begun. The bowels were kept open, as usual, with cathartics consisting very largely of epsom and Rochelle salts. The treatment of serial seizures and of status epilepticus was carried out in the usual way, that is to say by the use of elimination, restricted diet, but

instead of using drugs we formerly used to combat these conditions Luminal was substituted, but it became necessary to use larger doses, as many as five grains of Luminal every three hours were used.

Number of Convulsions.—There were 61 patients who had no convulsions since treatment was begun; 106 patients that had less than five convulsions while under treatment; 45 patients that had more than five convulsions. February 8 one patient died of lobar pneumonia; February 25 one patient died of mitral regurgitation; March 9 one patient died from status epilepticus.

The use of Luminal in the treatment of epileptic seizures is in the experimental stage and not until several thousand cases have been treated over a period of years will we be able to determine its true value.

Conclusions.—There was immediate decrease in the number of seizures, a decrease in the severity of the seizures, many of them changing from grand mal to petit mal, decrease in the severity of furore and a shortening of the time of confused states, an improvement of the mental and physical health of all patients, fewer number of accidents, a general improvement of the moral tone of the wards, and a complete cessation of the seizures in a large number of cases. No deleterious effects were observed on the kidneys or stomach; circulation, temperature and respiration are uninfluenced. It is not a habit producing drug and is not attended by any pleasurable or disagreeable sensation. In certain cases the drug is effective in twenty-four to forty-eight hours, in others not until a week or more has passed.

The purpose of this paper is to make a preliminary report on the effects of Luminal on institution cases, which are obviously the most severe types of epilepsy to be seen. The reports made by neurologists are apt to cover milder types of epilepsy which are treated in private practice. The results are so gratifying that I desire to present to the medical profession our results that they may see for themselves just what can be done with the severest types of epilepsy. Luminal gives promise of being the most effective and the least harmful of all drugs that have ever been used in the treatment of epilepsy, and will be a godsend to these poor, afflicted, pitiful, hopeless defectives.

CASE REPORTS.

CASE No. 1.—A. N. Age 24 years. Onset of seizures at the age of 4 years. Diagnosis, grand mal epilepsy with deterioration. Had been bed-ridden four months, having an average of 25 convulsions daily. Seizures were grand mal in type, very severe, at times throwing herself out of bed and injuring herself. December 8, 1919, $1\frac{1}{2}$ grains of Luminal was instituted to be given daily at bed time. December 9, 9 convulsions; December 10, 10 convulsions; December 11, 4 convulsions; December 12, 5 convulsions; December 13, 4 convulsions; December 14, 6 convulsions; December 15, 2 convulsions. There were no more convulsions until December 23, 1 convulsion; December 27, 2 convulsions; December 29, 2 convulsions; January 2, 3 convulsions; January 4, 1 convulsion; January 6, 1 convulsion. Her mental and physical condition at that time was very greatly improved. She was much heavier and up on ward. No more convulsions until January 26, 2 convulsions; January 31, 1 convulsion. No convulsions during February. March 11, 2 convulsions. On March 1 the supply of Luminal was exhausted and Luminal-sodium was given, the same dosage except an increase of ten per cent.

CASE No. 2.—M. D. Female. Age 14 years. Onset of seizures at the age of two years. Diagnosis, grand mal epilepsy plus imbecility. Was confined to her bed, having from two to 36 convulsions in 24 hours, untidy, had never learned to walk or talk. Treatment began December 17. December 18, three convulsions; December 31, three convulsions; January 1, two convulsions; January 4, three convulsions; February 1, one convulsion. Patient is now out of bed and on the ward, has gained in weight, has learned to walk and talk, and is attending the school for the feeble-minded. Has had one convulsion up to May 15.

CASE No. 3.—A. J. Female. Age 13 years. Confined to her bed, having convulsions ranging from five to 15 daily. Placed on Luminal, $1\frac{1}{2}$ grains daily, December 23. December 26, one convulsion. No seizures since that time. Patient able to be up on ward since January 1.

CASE No. 4.—L. B. Female. Age 15 years. Onset at the age of two years. Diagnosis, grand mal epilepsy plus idiocy. Was having five to 12 convulsions weekly; bed-ridden because of the numerous injuries incurred before being placed in bed, nose having been broken on several occasions and other bruises on the face and body. Placed on treatment December 21. December 22, four convulsions; December 27, two convulsions; December 31, one convulsion. No convulsions since. Up on ward. Better condition physically.

CASE No. 5.—M. G. Female. Age 17 years. Onset at the age of ten years. Diagnosis, grand mal epilepsy in a moron. Was having an average of 14 convulsions weekly. Had very severe convulsions, falling on her face and frequently bruising herself; nose had been broken on one occasion. Treatment was instituted January 8. January 12, one convulsion; January 27, one convulsion; March 15, two convulsions. No further convulsions.

CASE No. 6.—D. S. Female. Age 27 years. Onset at the age of ten years. Diagnosis, epilepsy plus imbecility. Was having six convulsions monthly. Treatment instituted January 8. March 4, one convulsion.

CASE No. 7.—G. E. Female. Age 17 years. Onset at the age of eight years. Diagnosis, grand mal epilepsy plus imbecility. Was having an average of one to six convulsions daily. Treatment instituted December 15. December 30, one convulsion; January 7, two convulsions; January 18, one convulsion; January 21, one convulsion; January 27, one convulsion; March 5, one convulsion.

CASE No. 8.—S. S. Female. Age 14 years. Onset at the age of three years. Diagnosis, grand mal epilepsy in a moron. Was having ten convulsions weekly. Treatment began January 8. February 1, one convulsion; February 6, one convulsion; March 2, one convulsion.

CASE No. 9.—R. P. Male. Age 46 years. Patient began having petit mal attacks at the age of 17, and later developed grand mal seizures. These attacks were followed by confused states lasting several hours, sometimes 24 hours. Was placed on Luminal January 4. Has had no convulsions or confused states since that date.

CASE No. 10.—H. K. R. Male. Age 30 years. Began having petit mal attacks at the age of two years and has been having on an average of two or three petit mal attacks weekly. Was placed on $1\frac{1}{2}$ grains Luminal at bed time January 4. Has had no convulsions since that date.

CASE No. 11.—C. M. Male. Age 59 years. Onset at the age of five years. Diagnosis, grand mal epilepsy plus moron. Has been having on an average of two to three grand mal convulsions weekly. Treatment was instituted January 4. No convulsions since that date.

CASE No. 12.—P. O. Male. Age 12 years. Began having seizures at the age of ten years, grand and petit mal attacks. Was having from one to five convulsions weekly; occasionally would have five to ten seizures within a day or two followed by a remission of two or three weeks. Treatment was instituted January 7. Has had no attacks since that date.

CASE No. 13.—E. S. Male. Age 11 years. Onset at the age of three years. Diagnosis, grand mal epilepsy plus infantile cerebral palsy. Was having two or three hard grand mal attacks daily over a period of three or four weeks followed by a remission of two to three weeks. Treatment instituted January 7. No convulsions since that date.

CASE No. 14.—G. C. Male. Age 29 years. Colored. Has had grand mal seizures for 15 years, averaging one seizure daily. Treatment instituted January 10. No seizures since that date.

CASE No. 15.—H. B. Male. Colored. Age 16 years. Onset of seizures early childhood. Diagnosis, grand mal epilepsy plus imbecility. Has been having on an average of two to three convulsions weekly. Treatment instituted January 10. No convulsions since that date.