COMMENT

The history and findings of the patient reported are typical of dermatomyositis and show the diagnostic triad of eruption, edema and myositis. Unusual features of this case were the absence of pain, the presence of mitral stenosis, and the isolation of organisms in the biopsy specimen. The onset in this patient was very gradual, and an organism of low virulence, undoubtedly introduced at the time of the vaccination, slowly spread throughout the body over the next few years.

Dermatomyositis may at times involve the myocardium, but never causes valvular lesions as seen in rheumatic heart disease. The mitral stenosis was probably due to rheumatic infection, as manifested by the "growing pains." These preceded the vaccination and were probably independent of the dermatomyositis.

Apparently, an autogenous vaccine was of value in this patient as in that of McGarrahan. Unfortunately, it is seldom that organisms can be isolated from muscle, and it is this fact that has cast doubt on the infectious etiology of the disease. It is of utmost importance, however, that contractures be prevented as much as possible, and that fixation of limbs occur in positions favorable to physiologic function. Following the subsidence of the acute disease, proper massage and graded exercises and manipulation are of inestimable value in rehabilitation.

IN CONCLUSION

1. A case of dermatomyositis is reported which followed vaccination for smallpox and which was associated with rheumatic heart disease.

2. Because of its apparent benefit in this case, further trial of autogenous vaccine in the treatment of dermatomyositis is indicated.

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DISCUSSION

ROBERT W. LANGLEY, M.D. (1930 Wilshire Boulevard, Los Angeles).—The condition of dermatomyositis occurs infrequently. Its recognition justifies attention and recording. The outlook is usually quite poor. There is little a cardiologist may contribute to this subject. Doctor Kellogg states that dermatomyositis may at times involve the myocardium, but I have been unable to substantiate this statement from any proved cases in the literature. Two fatal cases were recently reported by members of the staff of the Hospital of the Good Samaritan in Los Angeles. Autopsies on both cases failed to show myocardial damage, either gross or microscopic.

There is no question about the diagnosis of rheumatic heart disease of moderately severe degree in this case. The congestive heart failure responded satisfactorily to medical treatment.

Doctor Kellogg suggests, quite rightly I think, that rheumatic infection was associated with, but independent of the dermatomyositis. There may be some relationship between scleroderma and dermatomyositis. Cases have been reported where a transition appears to have taken place. This writer has observed a case of scleroderma associated with rheumatic heart disease. No relationship between the two seemed apparent.

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HIRAM E. MILLER, M. D. (384 Post Street, San Francisco).—Dermatomyositis is a comparatively rare disease, and it is always of value to report the findings in such unusual cases as this one. The prodromal symptoms in this woman were of very slow onset, extending over a period of eight years or more. She had marked contractures of her leg muscles; pigmentation gradually covered her entire body, but there was no history of an actual dermatitis. She had an associated valvular heart disease, with clubbing of the fingers. Streptococci were obtained by culture from a biopsy taken from the leg muscles. There are probably a number of diverse and only remotely related conditions classified under the symptom-complex of dermatomyositis.

I have observed several patients with this disease. They all have had a dermatitis on the upper face, eyelids and, in most instances, on the extremities. Many of them died due to paralysis of the visceral muscles generally of the respiratory tract. The dermatitis in most instances closely resembled disseminated lupus erythematosis. An associated leukopenia is also observed in this disease. In my experience, a leukopenia is generally found as is recorded in this case, and not a leukocytosis as is stated in the paragraph on symptoms.

I have seen various types of treatment used in this disease, but have not been convinced that any of them have materially changed the course of the disease. Some of the patients recovered and some of them died.

I do not believe that vaccination has played any part in causing the disease in this patient. I think it is unfortunate that this phase of the condition has been given such a prominent place in the conclusions.

INSULIN SHOCK THERAPY IN DEMENTIA PRAECOX: A REPORT OF A SERIES OF CASES*

By CLIFFORD W. MACK, M.D.
AND
B. O. BURCH, M.D.
Livermore

DISCUSSION *by J. M. Nielsen, M. D., Los Angeles; E. W. Mullen, M. D., Agnew; Samuel D. Ingham, M. D., Los Angeles.*

INTRODUCTION.—The treatment of dementia praecox by hypoglycemic shock, according to the method of Sakel, is largely empirical in character. The determination of its value can only be made by clinical application to a large number of cases over a period long enough to see the proportion of successes and failures. As the last four years have furnished much data, it is well for us to review the results and try to ascertain if this dramatic form of therapy merits a place in psychiatric practice.

EUROPEAN REPORTS

The reports from European clinics are much larger than from those in this country. Recent literature indicates that about two thousand patients have been treated all over the world. The greater magnitude of the work abroad may be due to its earlier use there; but this also leads one to believe that it has been given wider application than in America. Sakel[1] first reported 104 cases completed in 1937, in which series there were 70.7 per cent

* Read before the Neuropsychiatry Section of the California Medical Association at the sixty-seventh annual session, Pasadena, May 9–12, 1938.

recoveries. If to this figure is added those not having a full remission, but who were classed as fit to work, the total is 86.2 per cent. These were in the group of new cases under six months. The total percentage of recoveries in the series of 104 was 48 per cent, including both old and new cases. This is a startling recovery rate for a disease that has baffled psychiatrists for generations. A more recent article by Strecker,[2] including a report from the Müller Clinic in Switzerland, gives an analysis of 495 cases. The percentage of recoveries of those patients under one year was 57.2; under two years, 27.3; over two years, 11.3. The percentage of improved cases under one year was 22.2; under two years, 34.1; over two years, 32.2. These statistics, showing a recovery rate of 40.4 per cent for the entire series, are decidedly more modest than those just quoted.

AMERICAN STATISTICS

The American reports are not so extensive, but compare favorably with the European. The largest series comes from the Harlem Valley State Hospital,[3] in July, 1937, and comprises eighty-one cases. There were fifteen cases of a duration under two years, showing recovered and much improved, 66.66 per cent, improved 26.66 per cent; ten cases of two to four years, recovered and much improved, 40 per cent, improved 40 per cent; eight cases of four to six years, recovered and much improved, 37.5 per cent, improved 37.5 per cent; and thirteen cases of six years and over, recovered and much improved, 15.38 per cent, improved 61.51 per cent. It will be noted that there is a recovery rate of 44.4 per cent in the group as a whole if the much improved cases are included with the recoveries. The commonly accepted spontaneous remission rate is from 5 to 20 per cent.

REPORT OF CASES

The following nineteen completed cases are reported, out of a total of twenty-three treated.

CASE 1.—B. Age, 16. Some original mental defect. Duration, eleven months. Mental symptoms consisted of violent conduct, hysterical spells simulating fits. Later, in the course of the illness, the patient became apathetic, indifferent, and unproductive. Progressive mental deterioration. *Diagnosis:* Dementia praecox, hebephrenic form. *Treatment:* Total number, 93, with a maximum dose of 140 units. Four convulsions. *Result:* Slight improvement in conduct. Discharged unimproved.

CASE 2.—Bo. Age, 20. Normal youth, except somewhat retiring. Duration, one year. Mental symptoms consisted of delusions of poisoning, periods of extreme mental excitement, great pressure of activity, delusions of mistaken identity and auditory hallucinations. During the course of the illness these periods of excitement alternated with periods of quietude, unproductiveness, and a sad mood. *Diagnosis:* Dementia praecox, hebephrenic, with some features of manic-depressive psychosis. *Treatment:* Total number, 81, with maximum dose of 120 units. One convulsion. There was slight improvement, with diminution of cycles and hallucinations. *Result:* Unimproved.

CASE 3.—Ba. Age, 60. Normal social personality. Duration, four years. Delusions of persecution, despondency, fear of dirt infection and of contaminating other people. Suicidal ideas. Agitated and restless. Pronounced negativism. Physical examination negative. *Diagnosis:* Dementia praecox, paranoid. *Treatment:* Total of 6, with maximum dose of 60 units. The patient died, after receiving 40 units. Cause of death, on clinical data without autopsy, coronary sclerosis.

CASE 4.—T. Age, 40. Always timid, sensitive and overly conscientious. Duration, eighteen years. Symptoms of pronounced mental deterioration, following years of mental disease. Negativistic, unproductive. Mutters to himself and laughs sillily. Listless and apathetic; very untidy. *Diagnosis:* Dementia praecox, hebephrenic. *Treatment:* Total of 96, with maximum dose of 140 units. *Result:* Slight change in conduct, so that patient could engage more in occupations. Unimproved.

CASE 5.—McE. Age, 25. Shut-in type of personality. Duration, one month. Chief symptoms: Violent, impulsive conduct; delusions of persecution that he is to be electrocuted; that he is possessed of the devil. Homicidal threats. No hallucinations. *Diagnosis:* Dementia praecox, paranoid. *Treatment:* Total of 90, with maximum dose of 160 units; two convulsions. *Result:* Recovered. (A report after six months states that this patient is still well and working at his occupation.)

CASE 6.—To. Age, 20. Shut-in type of personality. Duration, nine months. Chief symptoms: Abnormal fear of death; depressed, anxious mood. Excitable and restless. Stereotyped conversation and conduct; mannerisms. *Diagnosis:* Dementia praecox, hebephrenic. *Treatment:* Total of 9. *Result:* Unimproved.

CASE 7.—MacL. Age, 34. College graduate. Normal personality. Duration, four years. Chief symptom: Delusions of persecution. Psychosis progressed slowly. Unable to work for three years because of delusional control and some neurasthenic complaints, with a mild degree of anemia. Outbreak of violent conduct and threats against the authorities caused his arrest and commitment. *Diagnosis:* Dementia praecox, paranoid. *Treatment:* Total of 189, consisting of two courses: the first one of ninety-three treatments, which brought about a remission lasting only two weeks; the second course, ninety-six, with the result that symptoms entirely disappeared. The patient is following normal conduct, but is still in the hospital. *Result:* Improved.

CASE 8.—W. Age, 23. College graduate. Unusually high intelligence—one of Terman's one thousand cases. Duration, two years. Chief symptoms: Inability to continue studies; delusions and suspicions about people; auditory hallucinations. Voices that came from former friends, one of whom kept her constantly hypnotized. Psychosis progressed, with evidence of deterioration. The patient became uncouth in manner and untidy. After some months, delusions changed to feelings of grandeur and ideas of royalty. *Diagnosis:* Dementia praecox, paranoid. *Treatment:* 114 doses, with maximum dose of 110 units. *Result:* Temporary improvement, but final result unimproved.

CASE 9.—F. Age, 25. Normal personality. Duration, one year. Chief symptom: Outbreak of violence because he could not conform to social usages. Arrested and taken to jail. After release he was unable to adjust himself. Psychosis progressed, with delusions of poisoning, and he eventually developed a state of stupor with complete negativism, in which condition he was brought to the hospital. *Diagnosis:* Dementia praecox, catatonic. *Treatment:* Total of 68, with maximum dose of 100 units. *Result:* Recovery. (A report five months later certifies that he is still well and following his former occupation.)

CASE 10.—J. Age, 33. Normal personality. Duration, five years. Chief symptoms: Delusions of poisoning. Violent spells. Homicidal, threatening to kill the family. Un-

regulated conduct, noisy, screaming, laughing sillily. The psychosis progressed. Auditory hallucinations, interfering with daily conduct. Hallucinations became sexual in content. *Diagnosis:* Dementia praecox, paranoid. *Treatment:* Total number, 68, with maximum dose of 70 units. Three convulsions. The patient improved very much in conduct, hallucinations diminished but did not disappear. No violent spells. The patient was very sociable and able to engage in occupations and exert good self-control among other people. *Result:* Improved, although still in the hospital.

CASE 11.—S. Age, 22. College graduate. Normal personality. Duration, three months. Chief symptoms: Mental confusion. Religious delusions that the world was coming to an end; that certain people were possessed of the devil; that he had power to do miracles. State of great mental and physical excitement continued. Auditory, and possibly visual hallucinations. As the psychosis progressed he became very noisy and disturbing, requiring packs and seclusion. *Diagnosis:* Dementia praecox, hebephrenic. *Treatment:* Total of 38, with maximum dose of 65 units. Two convulsions. Improvement began during second week of treatment. *Result:* Recovered. (Six months after discharge, report indicates that he is very well, and socially adjusted.)

CASE 12.—Wh. Age, 40. Rather retiring personality. Duration, eleven years. Chief symptoms: Delusions of a sexual nature, that she was being assaulted, and persecuted by neighbors and officers. Belief that husband's business was being hampered by her enemies. Delusions about dirt and infection in the house, always washing her hands and cleaning. *Diagnosis:* Dementia praecox, paranoid. *Treatment:* Total of 85, with maximum dose of 60 units. *Result:* The patient improved steadily in conduct and emotional reactions. She became more interested and concerned about her daily life. Delusional content diminished gradually. No new delusions were formed, and she was willing to refrain from any reaction to delusional ideas. Discharged improved. (Follow-up report is satisfactory.)

CASE 13.—L. Age, 15. Rather above the average in intelligence. Duration, three years. Chief symptoms: Loss of application in school. Disturbing dreams. Mental confusion. Auditory hallucinations. Religious delusions. Psychosis progressed, and while in the hospital she expressed many fantastic ideas, such as that she was pregnant, that voices accused her of wrongdoing. Negativistic. Tube-fed. *Diagnosis:* Dementia praecox, hebephrenic. *Treatment:* Total of 96, with a maximum dose of 80 units. Nine convulsions. *Result:* Unimproved.

CASE 14.—Tr. Age, 34. Rather quiet, retiring personality. Overly conscientious. Duration, five months. Chief symptoms: Painful depression. Fear that he had made an error and would lose his job. One month before admission he became very delusional and was placed under complete rest treatment at home. Thought that the company had spies about the house who were going to put him in jail. The psychosis progressed. He would not talk, sleep or eat. There was a severe excited spell, during which he ran about the house in terror, wanted to call the police, and jump out of the window. *Diagnosis:* Manic-depressive psychosis, depressed. *Treatment:* Total of 68 injections, with maximum dose of 140 units. Improvement began one month after treatment started. Symptoms gradually disappeared and the patient became more cheerful and coöperative. *Result:* Recovered. (Three months later the patient was reported well and has since been working at his former occupation.)

CASE 15.—K. Age, 25. College graduate. Very sensitive and seclusive type of personality. Duration, two months. Chief symptoms: Despondency, fear. Delusions that he had caused trouble in the plant and would be discharged. Afraid he would be shot, and attempted to disguise himself. Talked of suicide. Delusion that his reputation had been ruined by certain stories circulated about him in regard to sexual affairs. Believed his presence would injure everyone in his surroundings. *Diagnosis:* Manic-depressive, depressed. *Treatment:* 86 injections, with maximum dose of 200 units. Three convulsions. Improvement began after three weeks. He became more responsive in conversation, and applied himself to tasks and recreation. Psychomotor retardation, depression and delusions remained in evidence, but these gradually diminished and were the last to disappear after return of normal mood. *Result:* Recovered.

CASE 16.—R. Age, 27. Normal personality. Mild depression seven years previously. Duration, one and one-half months. Chief symptoms: Depression. Lack of interest in surroundings. Psychomotor retardation. Hypochondriacal delusions. Psychosis progressed. He became greatly disturbed emotionally and could not coöperate. *Diagnosis:* Manic-depressive, depressed. *Treatment:* Total of 45 injections, with maximum dose of 160 units. He improved gradually each week. At the end of the seventh week he was very much better, and appeared to his wife and others to be entirely well, except for a feeling of inadequacy and worry. *Result:* Recovered. (Three months later patient was normal and able to carry on his business affairs.)

CASE 17.—Ri. Age, 31. College graduate. Inclined to neurasthenic complaints. Duration, nine months. There had been a mental condition two years before, during which he was depressed. Chief symptoms: Confused, restless, and negativistic. Letters showed verbigeration. After a few weeks he became mute. A few spells of extreme excitement and violence. No change during a period of five months before treatment was instituted, except increasing stupor. *Diagnosis:* Dementia praecox, catatonic. *Treatment:* Total of 94, with maximum dose of 120 units. One week after treatment began the patient became less negativistic. In the second week voluntary activity predominated, and after six weeks he engaged normally in occupational and recreational pastimes. Improvement was gradual, with blocking in conversation the last symptom to disappear, but at the end of twelve weeks he was definitely convalescent. *Result:* Recovered.

CASE 18.—Wi. Age, 17. Slow in school. Industrious, but not sociable. Duration, seven months. Chief symptoms: Ill-tempered in school and could not study. He developed delusions that people were making fun of him. Later he was indolent and impulsive, and laughed sillily. Active hallucinations appeared, also delusions of poisoning. Committed to a state hospital. *Diagnosis:* Dementia praecox. *Treatment:* Total of 84, with maximum dose of 130 units. During a period of six weeks there was little change in the patient's behavior, but then he became more interested in activities. The acute symptoms left him, and he showed steady improvement. *Result:* Recovered.

CASE 19. Le. Age, 19. Normal personality. Duration, twenty months. Chief symptoms: State of depression and fear; later, pronounced mental confusion and violent conduct. Untidy habits, destructiveness, inability to feed herself or care for her person. Mental condition grew worse up to time of treatment. *Diagnosis:* Dementia praecox, catatonic type, allied to manic-depressive psychosis. *Treatment:* Total of 72, with maximum dose of 150 units. Two convulsions. Improvement was first noted at the end of the second week, with change in the patient's conduct. She became quieter and more easily controlled, and at the end of the seventh week mental condition began to clear and symptoms entirely disappeared. *Result:* Improved.

RESULTS

The results* of treatment of these cases can be summarized as follows: Recovered, 8 (42.1 per

* Thanks are due Dr. B. O. Burch, who personally managed the insulin treatments, and the other members of the medical staff of the Livermore Sanitarium for their assistance in the examinations and reports.

cent); improved, 4 (21.0 per cent); unimproved, 7 (36.9 per cent).

ANALYSIS OF CASES

Our series includes some very old cases—one as long as eighteen years, and another ten years; but they were included in the group because the families were very anxious to have them treated. If we classify the cases in accordance with the duration of the psychosis, those under two years give a recovery percentage of 61.5. The designation "recovered" in our classification means the disappearance of symptoms, return of insight, and ability to resume the former mode of life. "Improved" means those patients whose symptoms have not entirely ceased, who lack true insight but are able to make a fair social adjustment.

RELAPSES

The recurrences in our series are only two, and these were during the course of treatment. In Case 7, after the first twelve weeks of treatment the patient was symptom-free, but after two weeks there was a relapse, so his treatment was immediately resumed and has been satisfactorily concluded. In Case 19, the patient had a distinct remission at the end of six weeks, and for a few days was entirely well; but then she relapsed over a week-end. This we thought might have been due to the fact that she did not receive the usual dose of insulin. Treatment in this case was continued, and there is improvement, although the case is not yet completed. Among the patients who have been discharged from the Sanitarium, there have been no relapses; and one case in particular has been doing well for a period of ten months. The reports from the European clinics, as summarized by Strecker,[4] give 23, 15, and 14 per cent, while the large group of cases of Müller gives only 6.5 per cent. In our series it is to be noted that two of the cases had a very long course of treatment—189 injections in Case 7, which improved; 114 in Case 8, with possible improvement; and no harmful results in either case.

EFFECT ON CENTRAL NERVOUS SYSTEM

The possibility of damage to the central nervous system by a treatment that causes, during coma, definite signs of cortical irritation, such as unconsciousness, convulsions, positive Babinski, etc., should be considered. In our cases, follow-up neurological examinations are negative, even in those cases having the largest number of treatments, such as Case 7 with 189 treatments. Another patient, Case 2, had an atypical Babinski, but no other signs of neural injury. Also, none of the patients in the unimproved group developed a more serious psychotic state, but were to some extent better.

DANGERS OF TREATMENT

The hazards of such a radical form of treatment must be recognized because of the possibility of death or permanent physical or mental injury. The one fatality in our series was probably due to insulin sensitiveness, causing coronary thrombosis. Sakel, in his early series of 104 cases, reports the treatment of three cases over sixty, one of whom showed cardiac complications, but treatment was resumed. Dr. I. C. Brill of Portland, in a personal communication, furnished the following extract, quoting from a recent book by Arthur M. Fishburg on heart failure: "It has been seen that insulin hypoglycemia increases the work of the heart and that the injection of insulin may be followed in individuals with coronary arteriosclerosis by anginal pain and perhaps coronary thrombosis."

The extensive application of hypoglycemia cannot be accomplished without the coöperation of the public, relatives, and medical profession. It behooves us, then, to select our patients with the utmost care, excluding those who are poor physical risks or who are so far deteriorated as to mitigate against recovery, in order not to discredit this form of therapy. Therefore, it may be well to limit the cases to those under the age of forty.

FURTHER DANGERS

The dangers during shock from aspiration of mucus, convulsions, or lack of time to terminate coma, are not very grave. There is, undoubtedly, a wide margin between deep coma and death, as illustrated by the case mentioned in an article by Cameron and Hoskins, where a delayed reaction was unrecognized and the patient lived forty-eight hours. Also, the margin of safety between reversible and irreversible cellular changes in the brain is sufficient to give considerable latitude. Moersch and Kernohan,[5] reporting on the autopsy of three patients dying of hypoglycemia, give the following: "There were acute degenerative changes in the brain cells, but it appeared that early acute degeneration could have been restored to normalcy and have assumed their normal function under favorable circumstances." The death rate in Europe of a large series of cases has only been one-half of one per cent.

DIFFERENTIAL DIAGNOSIS

The cases in our series are not all dementia praecox, as some were diagnosed by the staff as manic-depressive psychoses. This brings up the question of selection of patients. As we lack exact differential diagnostic methods, such as the laboratory tests in paresis, the limitation of hypoglycemic shock to dementia praecox is impracticable. In view of the uncertainties of diagnosis, it would seem that all functional psychoses would be suitable for hypoglycemic shock treatment, possibly with the exception of the manic-phase of the manic-depressive psychoses. Patients with the depressed phase might well be included, as they are so often confused with dementia praecox patients. The treatment is not a specific for dementia praecox, so a wider selection is justified, and probably definitely indicated. There is a possibility that the manic-depressive psychoses would have less predilection to relapse if they, too, were treated by hypoglycemia.

ACCESSORY TREATMENTS

The many other therapeutic aids ordinarily in use should not be denied our insulin patients. They require a well-balanced daily program, including recreation, exercise, and occupational therapy. These need to be prescribed in proper dosage and

regulated in accordance with the rate of return of normal psychic functioning and emotional balance. It is our experience that psychotherapy—such as persuasion, suggestion, and therapeutic talks—is beneficial, but energetic probing of the mind must be avoided. This should be reserved until the patient is well advanced in a stage of convalescence, and not applied in the early days of treatment when the mental processes are only partially under conscious control.

THEORETICAL CONSIDERATIONS

As to the theoretical explanation of the therapeutic benefits, we have very little to offer. It may be that we are entering upon a new era in the treatment of mental patients, using the physiological approach, as pointed out in a paper by C. W. Mack[6] before this Society in 1935. Stimulation of brain cellular activity by the hypoglycemic state might well be the explanation of the improvement obtained. The only practical point in this connection to be seen in our series is that all recovered cases showed a gain in weight. This may mean an improvement in brain nutrition, due to an increase in the power of neuronic tissue to utilize sugar.

CONCLUSIONS

The final place in psychiatry of hypoglycemic-shock therapy will be determined in the years to come after the extent of recurrence has been studied. It may be that the ultimate result will show a more severe deteriorative process in patients with a malignant psychosis. A survey of the method to date, however, leads to the conclusion that it is a most fruitful form of treatment, and far surpasses anything at our command for the functional psychoses. The thought arises that hypoglycemic shock might well be applied to all new cases of this type received for treatment, either in private or public practice. The increased recovery rate in comparison with conservative programs of the past outweighs the risks, difficulties and expense. The state hospitals have such a large influx of patients that a great burden would fall upon the medical organizations of these institutions if all new patients were treated. The economic saving, however, by decreasing the total number of hospital days, would soon recompense the state for any additional expense in the acute services. The need for early treatment is apparent to all who have been engaged in this work, as the best results are obtained in the first few months of the illness.

SUMMARY

1. A review of the literature reveals a recovery rate of 40 to 50 per cent of patients treated with hypoglycemic shock.

2. The largest American report available compares favorably with the European statistics.

3. A series of nineteen cases is reported by the author, with 42.1 per cent recoveries.

4. The relapses in Europe are 6.5 to 23 per cent.

5. The treatment should not be limited to dementia praecox, but deserves wide application in all early functional psychoses.

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DISCUSSION

J. M. NIELSEN, M.D. (727 West Seventh Street, Los Angeles).—Doctor Mack's paper is timely and well chosen. It is evident, from the number of treatments given to each patient, that he treats thoroughly. I am not in position to discuss the efficacy of the treatment in conditions other than schizophrenia, as we have confined our work to that group. Our group of three doctors has given thirty-six courses of insulin shock treatment to thirty patients (fifty shocks per treatment) and this means fewer shocks to each than Doctor Mack has given. On the other hand, we have given considerably larger single doses, as many have received 200 units daily, and some a great deal more, one 450 units per dose for a time.

As to complications, I note that Doctor Mack has had one death. This, however, was in a patient sixty years of age, so that is not strange. Our series of thirty cases includes only four over 36 years of age—39, 43, 48, and 49, respectively. We were more careful with these four than usual, and all survived; but there was no therapeutic benefit, except improvement in one of them. On the other hand, we have had considerable trouble with pulmonary complications. Three of our patients have had severe pulmonary edema and one, pulmonary embolus. The complication was very nearly fatal in each case. Those complications are our greatest fear; and a report of them will appear in the *Journal of the American Medical Association.* Prolonged coma, from which it was impossible to restore our patients for many hours (as long as thirty-three hours), has also occurred quite a number of times, but this is not dangerous unless simultaneous pulmonary edema ensues. So far we have had no fatality, but we may have one at any time.

I have arranged our therapeutic statistics to be comparable with those of Doctor Mack. Of our cases of schizophrenia (thirty cases) there were eighteen recent ones with recovery in twelve, improvement in four, and no results in two. We have treated twelve patients with disease of long standing (old cases), in which we did not obtain recovery in a single one, but improvement in six.

We think the method has come to stay as a permanent part of a psychiatrist's armamentarium, and we recommend it in the acute cases, especially those in young persons. In cases of long standing (more than a year), we tell the relatives that the percentage of recovery is very low, and hardly worth while unless the situation is desperate. We promise no results to anyone and we stress the dangers. We demand that the family take its part of the responsibility in any unfavorable outcome. The family must similarly be a unit in meeting the hazards emotionally. We assume the attitude that each treatment is very much like a surgical operation, and one must be prepared for all emergencies.

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E. W. MULLEN, M.D. (Agnew State Hospital, Agnew). I have enjoyed Doctor Mack's paper on insulin shock therapy in dementia praecox very much. This is a subject which is receiving attention in the medical profession, and especially in that part of the profession which practices psychiatry.

Doctor Mack's approach is scientific and thorough. His conclusions are well founded. His findings indicate that, while a certain percentage of mental cases recover under the insulin shock treatment, some only improve and some do not improve. I think he might have added that in some cases their condition becomes more aggravated. Therefore, the treatment is not a specific. However, any treatment that gives relief in some cases should be given our honest and earnest attention.

Perhaps the name "insulin shock" is not the best name that we could have used in this treatment. It is not a true condition of shock as we see in surgery, etc.; it is more of a toxic condition. Perhaps it is really more of a mental shock than a physical. This, however, is not important if you get good results.

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SAMUEL D. INGHAM, M.D. (727 West Seventh Street, Los Angeles).—The authors have given us a practical review of the status of insulin shock therapy, as reported from various clinics, as well as their own results. Their experience has been in close accord with most of the work reported, and indicates that the insulin treatment of dementia praecox is the most efficient means of treating this condition.

It is to be emphasized that success of this treatment depends largely upon the technique of its administration and, therefore, upon the experience and judgment of those who are using it. The best results are obtained when insulin shock is carried to the ultimate degree consistent with a reasonable margin of safety. It is, therefore, important to be on the alert for danger symptoms and to be ready with emergency treatment. No satisfactory theory has been offered to explain benefits derived from the insulin treatment of schizophrenia, although several have been proposed.

It is of interest to note the marked improvement in the physical condition of patients which occurs simultaneously with the improvement of the mental condition. This includes a gain in weight, improved digestion, better circulation and vasomotor stability, as well as general improvement in vegetative functions.

I think that all who have had a comprehensive experience with this form of treatment can subscribe to the conclusions of the authors expressed in their summary.

CONGENITAL RENAL ANOMALIES*

WITH SPECIAL REFERENCE TO HORSESHOE KIDNEY

By CARL F. RUSCHE, M.D.
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DISCUSSION *by Robert V. Day, M.D., Los Angeles; Benjamin H. Hager, M.D., Los Angeles; William E. Stevens, M.D., San Francisco.*

DOUBLE kidneys, reduplication of pelves and ureters are the most frequent anomalies of the upper urinary tract. Next in frequency is horseshoe kidney. In general, this interesting renal mass may be defined as a symmetrical, semicircular fusion of the two kidneys across the vertebral column by a bridge or isthmus which, even without concomitant disease or gross pathology, produces a clinical syndrome called horseshoe kidney disease; an entity due to pressure, which is characterized by indefinite epigastric or umbilical pain, intestinal and urinary stagnation.

CLASSIFICATION

In order to institute better clinical and surgical management of horseshoe kidney, Gerard, and later Gutierrez, have classified the subject into symmetric and asymmetric groups. The symmetric division refers to fusion by a bridge of renal or fibrous tissue of the two organs at the lower poles with concavity upward, or fusion of the upper poles with concavity downward. This organ rests astride the vertebral column. The asymmetric type refers to irregularities in shape, location, and position. This entity is less common and the individual types accordingly are termed unilateral fused kidney, L-shaped renal fusion, fusion en glatte or disc form, sigmoid fusion, fusion en masse, and fusion without form.

INCIDENCE

With the advent of urography, the incidence of this anomaly has markedly increased. Various averages from the statistics of several necropsy surgeons before the introduction of pyelography, fix the rate to about 1:1000; however, with this method of urologic diagnosis the frequency has been increased to about 1:400, and even more recently the ratio is reported to be 1:200 pyelograms. In 68,989 necropsies reported by Carlier and Gerard, there were eighty horseshoe kidneys, or 1:862; Kuster, 1:1100; Davidsohn, 1:1000; Judd, Braasch and Scholl, 17:2424 operations on the kidney; Bettez, 1:715; Guizzetti and Pariset, 1:1142; Marynski, 1:683; Naumann, 1:600; Jeck, 1:643; Thompson, 19:12,888 (1:671); Motzfield, 92:73,489 (1:710); Lipshutz and Hoffman, 105:70,502 (1:671); Legueu and Papin, 1:600.

EARLY LITERATURE

In the annals of medical history, from the ancient down to modern times, one can find a fascinating story of this subject. First, the ancient anatomist and post-mortem surgeon reported this "monstrosity"; then, with the commencement of kidney surgery late in the nineteenth century, the anomaly was discovered during abdominal exploration for tumor; and, finally, this history continues on to an era of clinical diagnosis by physical examination, and more recently, to conclusive diagnosis by retrograde or intravenous urography.

Early in embryonic life it is an established fact the pronephros, mesonephros, and metanephros arise from both entoderm and mesoderm. The pronephros degenerates early and is considered rudimentary in character; the mesonephros is important during embryonic life, and its remnants enter into formation of the genital tract; and, lastly, the metanephros establishes itself as the permanent kidney. The renal buds appear behind and at the lower end of the mesonephros or Wolffian duct during the fourth week and progressively change their shape and position; hence, the opportunity for anomalous development between the fifth and seventh week. These anlagen arise on a level with the second sacral vertebra below the umbilical arteries and aortic bifurcation, and migrate upward. This vascular mechanical obstruction, according to several writers, may impede the ascent and rotation and permit fusion to take place.

SYMMETRICAL FORM

The most common or symmetrical form of horseshoe kidney is a semicircular mass of renal substance whose concavity is upward, and united at the lower poles (90 to 95 per cent) by a bridge or isthmus of renal or fibrous tissue which crosses the spinal column. The renal parenchyma usually retains some marks of fetal lobulation, and the right and left halves are seldom exact in position

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