The efficacy and dosage of curare preparations are considered, and techniques employing trilene for abdominal cases and cyclopropane for thoracic cases described.

Twenty cases with ocular complications are reported. The effect of curare on the blood pressure and on severe laryngeal spasm is also mentioned.

An analysis of post-operative results is given and eight deaths after curarization are discussed.

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d-TUBOCURARINE CHLORIDE IN ELECTRO-CONVULSION THERAPY

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It is now generally known that *d*-tubocurarine chloride is used to obtain good relaxation in general anaesthesia. Its value as an aid in electro-convulsion therapy may, however, be of equal importance. Griffith (1946) reviews the history and present knowledge of the clinical use of *d*-tubocurarine chloride, with special reference to anaesthesiology, and discusses the physiological action of the drug. A further review of the literature is given by Kellgren *et al.* (1946).

An obstacle to the use of electro-convulsion therapy in feeble persons has been the strain imposed on the skeletal structure by the violent muscular contractions produced. *d*-Tubocurarine chloride enables electro-convulsion therapy to be given in cases in which the physical condition would otherwise be a contraindication.

Methods.—The drug is given intravenously, and in our experience it is advisable to test the patient's tolerance with small doses before electro-convulsion therapy. We commence with 1 mg. per stone (6.4 kg.) of body weight, and this is increased on successive days until the patient is just unable to raise the head from the pillow after about four to five minutes. Electro-convulsion therapy is then given in the usual way.

One of our cases was a woman who in attempting suicide had sustained a fractured surgical neck of the humerus and a fractured pelvis. She was in a state of acute melancholia and actively suicidal. Electro-convulsion therapy was required, but the recent bone injuries made its administration impracticable. Under the influence of 15 mg. of *d*-tubocurarine chloride the electroplexy produced a mere "purring sensation" in the muscles. This procedure was repeated on six occasions and she made a good psychiatric recovery; and she was up and about, with a good orthopaedic result, when she left hospital.

Another illustrative case was that of a reactive depression in a man of 34 who complained of severe pain in his back after one dose of electro-convulsion therapy. X-ray examination showed no bony injury of the vertebrae, but in the ordinary way treatment would have been discontinued. With *d*-tubocurarine chloride it was possible to continue treatment. His pain has now gone and he has made a social recovery. This was one of our early cases, and an initial dose of 20 mg. was given. There was marked respiratory paralysis and apparent loss of consciousness. The pulse remained of good volume and regularity throughout, and after about five minutes' artificial respiration normal respiratory rhythm recommenced. An interesting feature was that the patient was later able to give an account of the artificial respiration and other restorative measures (physostigmine, etc.), taken during a period when he appeared to be deeply unconscious. It seems then that the drug, despite its dramatic effect on motor activity, had little influence on the sensorium. This is in agreement with the findings of Kellgren *et al.* (1946).

Conclusion.—*d*-tubocurarine chloride appears to be effective in minimizing convulsions in electro-convulsion therapy. Although both *d*-tubocurarine chloride and electro-convulsion therapy are respiratory depressants no synergistic action between the two has been noted with the relatively low dosage used.

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Medical Memoranda

Unusual Case of Poisoning by Zinc Sulphate

The following case seems worth recording because of the unusual sequelae. In the literature at my disposal I cannot find any description of a similar sequence of clinical events.

CASE HISTORY

An Indian woman aged 35 was admitted into the General Hospital, Johore Bahru, Malaya, at 9.30 a.m. on March 4, 1946. About one and a half hours previously she had taken a dose of "salts" for constipation, and this was followed in a few minutes by vomiting and purging. The substance swallowed was mistaken for Epsom salt, and approximately 1 oz. (28 g.) was taken. The bottle with the remaining noxious contents was brought to hospital, and the white crystals proved on analysis to be zinc sulphate. The vomitus contained the same substance.

On admission the patient was acutely collapsed and very restless. There was no abnormality of the lips, tongue, or buccal mucosa. Treatment with demulcents, morphine, and nikethamide produced marked improvement within twelve hours. On March 5 her general condition was satisfactory, and vomiting had ceased. There had been no haematemesis. She complained of abdominal pain of a colicky nature, but examination revealed no abnormality. The temperature was normal, there was a persistent tachycardia of 90 to 100 a minute, and examination of her urine showed no abnormality, chemically or microscopically. On the 6th progress was well maintained, and there was no blood in the stool. Next day the improvement continued, but she vomited two *Ascaris lumbricoides*. At about 8.30 a.m. on the 8th I was informed that the patient had suddenly collapsed. On examination she was found to be semicomatose with a marked ketosis. Blood was sent for estimation of the sugar content, and a catheter specimen of urine for examination. Insulin therapy was immediately instituted, 60 units of the soluble product, of doubtful potency, being given intramuscularly, as the intravenous route was impossible owing to collapse. Nevertheless, the patient's condition continued to deteriorate and she died at 7.30 p.m. The blood sugar was 380 mg. per 100 ml., and the urine was loaded with albumin, sugar, and ketones.