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"MYANESIN" AS A RELAXANT IN CHILDREN

BY

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$\alpha : \beta$: dihydroxy- γ -(2-methylphenoxy)-propane ("myanesin," British Drug Houses Limited) is obtainable in 10-ml. ampoules of a 10% solution. Its use as a relaxant in anaesthesia was first described by Mallinson (1947), and its pharmacology has been discussed by Berger and Bradley (1947). Unlike curare, myanesin does not appear to interfere with voluntary movements, but only with spinal reflexes, and therefore, presumably, with muscle tone. It may be suggested that its site of action is the internuncial neurones, which might account for the fact that respiration is not inhibited for long periods. Toxicity is low.

Myanesin has been used by me since February, 1947. In adults its action was not so marked as that of curare, and it was enhanced by ether and by thiopentone, while its effect was minimal when only nitrous oxide or cyclopropane was the anaesthetic used. Further, although abdominal relaxation might occur, laryngeal spasm was not prevented. It therefore seems that its use in adult surgery is limited, although it may be of value in cases in which the respiratory depression caused by curare may be a source of alarm.

Relaxation may be obtained for abdominal surgery in infants by a number of methods. Deep ether anaesthesia is open to obvious dangers; local analgesia is time-consuming, and comparatively large doses of the agent may be needed, and even then relaxation may not be perfect; spinal analgesia, while being unsuitable psychologically for children over 2 years of age, is difficult to give to younger infants, and there are obvious hazards associated with it. Curare, in my hands, has given good relaxation, but has always been associated with profound respiratory depression. This may be serious in the infant, owing to the difficulty of controlling it: closed and semiclosed methods of anaesthesia are contraindicated on account of the "dead-space," while without endotracheal intubation it is almost impossible to inflate the lungs and not distend the stomach. It is questionable whether intubation, with consequent narrowing of the glottis, is advisable in very small infants.

Myanesin was administered to 44 children between the ages of 24 days and 4½ years. The results have been satisfactory. In all cases maintenance of anaesthesia was with open ether, induction being with ether, nitrous oxide, or ethyl chloride. There were 16 cases of intussusception, 16 of

pyloric stenosis, and 12 of appendicitis, with or without peritonitis. Anaesthesia was maintained in first plane, third stage; in cases lasting up to 20 minutes it was found that one dose of myanesin sufficed, and that no more ether was required after the peritoneum had been opened. Recovery was extremely rapid, and the post-operative condition was always better than would have been expected had other means been employed. Respiratory depression lasting 15 to 30 seconds occurred in one-third of the cases; in one case respirations were completely inhibited for nearly half a minute. After the initial depression the tidal air assumed normal proportions. There were no obvious changes in pulse rate, although blood pressures were not taken. There were no deaths during operation, but two occurred after operation, in neither case ascribable to myanesin. Relaxation came on rapidly and was good for 10 to 25 minutes after injection, its extent being sometimes obscured by pre-existing distension of the bowel. Clinically, no effect upon bowel movements or tone could be seen.

The injection of myanesin was made into the intravenous drip, if one were set up, or into the longitudinal sinus at the posterior angle of the anterior fontanelle, for at this point the sinus is wider than in front and the approaching edges of bone direct the needle automatically into the vein. Blood is aspirated before injection, but it is unlikely that intrathecal injection would be dangerous. The dose was in the order of 2 ml. per stone (6.35 kg.) of body weight.

The following cases, selected from the series, illustrate the dosage and effect of myanesin in children.

Case Reports

Case 1.—Pyloric stenosis. Aged 24 days. Weight 9 lb. 3 oz. (4.17 kg.). General condition good. Rammstedt's operation. Induction and maintenance with open ether. Myanesin 1.5 ml. into the longitudinal sinus at six minutes. Slight respiratory depression for 30 seconds. Relaxation excellent and still present at the conclusion of operation at 26 minutes. Child began to cry as the last suture was inserted. No ether had been given after the peritoneum was opened. Recovery uneventful.

Case 2.—Pyloric stenosis. Aged 4 weeks. Rammstedt's operation. Induction and maintenance with open ether. Myanesin 1 ml. at eight minutes. Operation concluded at 19 minutes. Relaxation good. No respiratory depression. Recovery uneventful.

Case 3.—Pyloric stenosis. Aged 6 weeks. Weight, 7 lb. 2 oz. (3.23 kg.). Rammstedt's operation. Induction with open ether, maintenance with ether-oxygen endotracheally with Ayre's T-piece. Myanesin 0.75 ml. at five minutes. Operation concluded at 19 minutes. Relaxation poor at first (? underdosage), although there was slight respiratory depression for 15 seconds. Relaxation good during closure. Recovery uneventful.

Case 4.—Pyloric stenosis. Aged 8 weeks. Rammstedt's operation. Induction and maintenance with open ether. Myanesin 1.5 ml. into the longitudinal sinus at seven minutes. Operation concluded at 20 minutes. Relaxation excellent. Respirations completely inhibited for 20 seconds after myanesin had been given. This inhibition of respiration caused some alarm while it lasted, but there was no change in colour. When respiration was resumed it was at first rather shallow, but it became normal after a further 30 seconds. Recovery uneventful.

Case 5.—Intussusception. Aged 3 months. Weight, 11 lb. 5 oz. (5.13 kg.). Induction and maintenance with open ether. Myanesin 3 ml. at five minutes. Operation concluded at 27 minutes. No respiratory depression. Relaxation good; reduction of the intussusception intraperitoneally. Recovery uneventful.

Case 6.—Intussusception of three days' standing. Aged 4 months. Weight, 10 lb. 10 oz. (4.82 kg.). General condition fair. Intravenous drip (plasma) set up two hours before operation. Induction and maintenance with open ether. Myanesin 1.5 ml. was administered at seven minutes, with slight respiratory

depression for 30 seconds. Intraperitoneal reduction of the intussusception was impossible and resection of a portion of the gut with end-to-end anastomosis was undertaken. At 38 minutes a further dose of 1 ml. was administered. Operation was concluded at 57 minutes. Only small quantities of ether were employed from time to time to maintain anaesthesia in the first plane, and the child started to cry while the skin was being sutured. Death occurred five hours later.

Case 7.—Intussusception. Aged 7½ months. Weight, 19 lb. (8.62 kg.). Induction and maintenance with open ether. Myanesin 2 ml. into the longitudinal sinus at six minutes. There was slight respiratory depression for five minutes. Operation concluded at 14 minutes. No ether was administered after the myanesin had been given. Relaxation was excellent. Recovery uneventful.

Case 8.—Intussusception. Aged 11 months. Weight, 18 lb. 8 oz. (8.39 kg.). Induction and maintenance with open ether. Myanesin 2 ml. at 13 minutes into the longitudinal sinus. Operation concluded at 33 minutes. No ether administered after the peritoneum was opened. Relaxation was excellent. Recovery uneventful.

Case 9.—Appendix abscess for 48 hours. Aged 1 year 10 months. General condition bad. Induction and maintenance with open ether. Myanesin 3.5 ml. into the intravenous drip saline at two minutes, and a further dose of 1.2 ml. at 16 minutes. Operation concluded at 32 minutes. There was no respiratory depression, but relaxation was not quite so good as usual. Death occurred from peritonitis on the fifth day.

Case 10.—Appendicitis. Aged 3 years 11 months. Induction with ethyl chloride, maintenance with open ether. Myanesin 5 ml. at three minutes. Operation concluded at 16 minutes. There was no respiratory depression. No ether was administered after the peritoneum was opened. Relaxation was good. Recovery was uneventful.

Case 11.—Appendicitis with abscess. Aged 4 years 6 months. Temperature, 103° F. (39.4° C.). Pulse, 150 before operation. Induction with nitrous oxide, maintenance with open ether. Myanesin 3 ml. at three minutes and 1.5 ml. at 23 minutes. Operation concluded at 33 minutes. Small quantities of ether were required from time to time. There was no alteration in the pulse rate during operation and no respiratory depression. Relaxation was good. Recovery uneventful.

The 44 cases to which myanesin was administered were unselected. The results achieved seem to indicate that relaxation in infants can be obtained with greater ease and safety with myanesin than with any method previously employed. The lack of anxiety which was felt during operation, even about patients gravely ill, is a fair measure of the success obtained with this drug.

Summary

Various methods of obtaining relaxation in children not having proved entirely satisfactory, myanesin was used with success in 44 cases. There were no deaths or post-operative complications attributable to it, in spite of the serious general condition of some of the patients. Relaxation was good and of a sufficient duration to render a second dose unnecessary, save when the operation was somewhat prolonged.

The technique of administration is described, and the dosage employed in eleven cases is given in detail.

Anaesthesia was maintained in every case with ether, and it was usual to find that little or none was required after the myanesin had been introduced.

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TREATMENT OF GOLD DERMATITIS BY BAL

BY

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The use of BAL (2,3-dimercaptopropanol) in the treatment of gold dermatitis has been reported on in this country by Peters *et al.* (1947) and by Slot and McDonald (1947), and in the U.S.A. by Cohen, Goldman, and Dubbs (1947), by Ragan and Boots (1947), and by Lockie, Norcross, and George (1947). Its efficacy seems to be due to its ability to form relatively stable ring compounds with gold salts, thereby diminishing the reaction with the tissues and increasing urinary excretion from the system (Peters *et al.*, 1947). The following account is of its action on two cases of gold dermatitis seen recently.

Preparation and Mode of Administration.—The preparation used was 5% BAL in arachis oil, with 10% benzyl benzoate. It was administered by deep intramuscular injection into the buttock or thigh. The site of injection was subjected to light massage for a few minutes afterwards, as it was thought that this might diminish any pain and tenderness and possibly lessen the danger of inflammation and abscess formation. The dosage was 2 ml. four times on the first day, 2 ml. thrice daily for three days, 2 ml. once daily for nine days, and thereafter 2 ml. every alternate day.

Case 1

A lorry driver aged 45 had suffered from rheumatoid arthritis over a period of fifteen years. In 1942 he was given a series of gold injections (preparation and total amount prescribed unknown). After 12 injections the course had to be stopped because of the development of a rash involving both axillae, perineal and scrotal areas, legs, and trunk. He at the same time had what appears to have been a severe stomatitis. There was apparently no amelioration of the rheumatoid arthritis.

A second course of 16 injections of "myocrisin," totalling 0.985 g., was given between May 20 and Sept. 30, 1947. There was apparently a marked improvement in his primary condition, the E.S.R. falling from 123 mm. to 28 mm. in the hour (Westergren), but the patient himself noticed little change in the pain or the disability. On Oct. 7 (one week after finishing his course) a rash appeared, and on Oct. 21 he was admitted to the Royal National Hospital for Rheumatic Diseases, Bath.

On admission he was a typical case of long-standing rheumatoid arthritis, with an extensive exfoliative dermatitis of seborrhoeic type involving almost the whole body, being particularly severe on the scrotum and in the axillae. There was oozing in the scrotal area, and generalized itching which caused great discomfort. BAL therapy was started on Nov. 10 and discontinued on Nov. 21. A total of 32 ml. was given. On Nov. 18 an area of inflammation (redness, heat, pain, and induration) developed in the right buttock at the site of an injection. This resolved after treatment with local heat and parenteral penicillin. There were no other complications. No amelioration of symptoms occurred until the sixth day after the beginning of treatment, when the itching stopped and it was noticed that the dermatitis was improving.

The patient continued to improve, and on Dec. 8 the rash had almost completely disappeared, only pale pink discoloured areas in various places remaining. He noticed no change in the condition of the arthritis. Corrected suspension stability by the method of Collins *et al.* (1939) was 82% in the first hour at the beginning of treatment and 59% in the first hour on Dec. 8.

Case 2

A miner aged 43 gave a history of typical rheumatoid arthritis dating from January, 1946. He was first admitted to this hospital on Nov. 12, 1946, when he was treated by