

Summary and Conclusions

The results of a trial of ethopropazine in the treatment of cerebral palsy are recorded. Ten children with various types of cerebral palsy were given ethopropazine and a comparable group of nine children received lactose control tablets.

There was an improvement of 23.3% in the children treated with ethopropazine, but a similar improvement occurred in those who received only lactose tablets. No evidence of a special effect of ethopropazine on any type of cerebral palsy or on any specific ability was obtained. It is therefore concluded that ethopropazine is of no value in the treatment of cerebral palsy.

This trial was carried out under the auspices of the Scottish Council for the Care of Spastics. I wish to thank the staff of Westerlea School for their willing co-operation and Messrs. May and Baker Ltd. for generously supplying the lysivane.

REFERENCES

- Berger, F. M., and Schwartz, R. P. (1948). *J. Amer. med. Ass.*, **137**, 772.
 Effron, A. S., and Schultz, W. M. (1951). *Amer. J. med. Sci.*, **221**, 561.
 Garai, O. (1951). *Lancet*, **1**, 429.
 Gillhespy, R. O. (1951). *British Medical Journal*, **2**, 301.
 Jersild, T. (1950). *Acta paediat., Uppsala*, **39**, 51.
 Palmer, H., and Gallagher, D. J. A. (1950). *British Medical Journal*, **2**, 558.
 Perlstein, M. A., and Barnett, H. E. (1950). *J. Amer. med. Ass.*, **142**, 403.
 Sigwald, I. (1949). *Presse méd.*, **57**, 819.

ADRENALINE NECROSIS

BY

G. LESLIE, M.D.

Senior Registrar, Department of Dermatology, Royal Infirmary, Glasgow

AND

D. McPHEE, M.D., B.Sc.

Tissue necrosis due to adrenaline injections is a rare occurrence when it is considered how often the drug is administered.

Urbach (1936) reported a case in which multiple areas of skin necrosis followed the self-administration of adrenaline by a female patient who suffered from severe bronchial asthma. To gain relief she often gave herself as many as three injections a night. Urbach observed insistent "intention tremor" at the time of injection, which often took as long as fifteen minutes to complete. When the injection was given to the patient he was unable to get the slightest reaction in the skin. Again, when the patient herself administered an injection of normal saline there were no visible changes in the skin. In this way it was shown that the damage produced by the adrenaline injections was not due solely to mechanical irritation. Urbach concluded that the trauma caused by the "intention tremor" combined with the constriction of the blood vessels, due to the adrenaline, produced a necrosis of the superficial skin.

Necrosis of the tips of two fingers of the hand of a patient operated upon for Dupuytren's contracture was noted by Hanke (1936). The local analgesic used was a 1% procaine-adrenaline solution, the adrenaline being added in the correct dosage just before the injection. He thought that the explanation of this was that the anaesthetizing fluid had acted over a prolonged period on tissue devitalized by the gradual contraction of the palmar aponeurosis which is a feature of the disease.

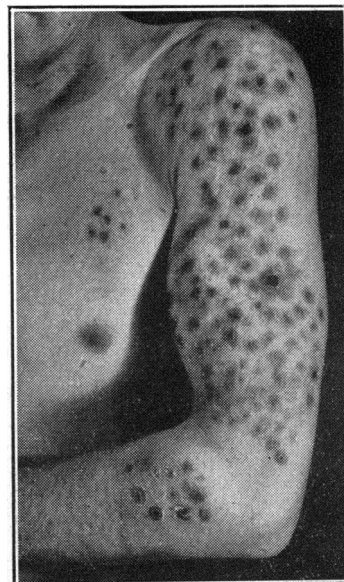
The most recent case of tissue damage due to the self-administration of adrenaline was reported by Robertson (1951). In his case the tissue reaction was that of keloid formation, which was presumably a personal skin characteristic and due to trauma with a hypodermic needle.

Delaunay *et al.* (1948) conducted a series of experiments, injecting adrenaline in various strengths (1,000 μ g., 200 μ g., 100 μ g., 50 μ g., 33 μ g., 25 μ g., 20 μ g., and 10 μ g.) under the skin of the abdomen of guinea-pigs. The stronger solutions (1,000–25 μ g.) produced changes in the skin visible to the naked eye. With the weaker solutions reactions were noted microscopically. These workers think that adrenaline is not directly toxic to tissues, but that adrenaline necrosis arises rather from various vascular disturbances. They suggest that both vasomotor upsets and disturbance of the permeability of the vessels play a part by interfering with the oxygen supply to the tissues and by inhibiting the diapedesis of polymorphs.

Because of the seeming rarity of skin reactions to the repeated use of adrenaline, and because trauma has apparently played some part in the causation of the cases reported, it was thought that the following case was worth recording.

Case Report

A joiner aged 35 developed asthma at the age of 14, and, after prolonged treatment with various remedies, he obtained relief only from injections of adrenaline. About five years ago his attacks became more frequent and severe, totally incapacitating him, and he found it necessary to give himself adrenaline by injection (1 ml. of 1/1,000 three or four times daily). He became so dependent upon the adrenaline that he administered it as a routine in anticipation of an asthmatic attack. These injections continued for two and a half years without any noticeable cutaneous reaction, the dose remaining the same. He first noticed, at the site of injection, a small red swelling which was painless and did not itch. The surface of the swelling then broke down and a necrotic central patch developed. A black eschar was eventually sloughed and a shallow ulcer remained. This sequence of events took seven to ten days. The ulcer healed slowly, leaving a foveated scar, which later became livid.



Photograph showing active, healing, and healed necrotic areas.

In spite of these reactions he continued to give himself the injections, in the same dose, for a further period of two and a half years, at which time he was seen by one of us (D. McP.).

On examination his appearance was startling. His buttocks, thighs, arms, and shoulders were covered by a multitude of active, healing, and healed necrotic areas of almost uniform size and shape. He was beginning to run short of accessible parts on the limbs and was encroaching on the chest (see Fig.). Until the onset of the skin reactions the right and left arms had been used alternately for the injec-

tions. His general condition was good and nothing abnormal was detected in any of the vital systems. During a series of readings the blood pressure remained in the region of 127/80.

Comment

Trauma does not seem to have played any part in the causation of the skin reactions in this case. The injections were administered for two and a half years without any visible skin change, and while, so far as the arms are concerned, trauma from repeated injections could have been a causative factor, this cannot be said of the new areas of skin used after the onset of the cutaneous reactions, as necrotic lesions developed on these even after the first injection into them, and continued to develop after each fresh injection until all accessible areas on the limbs had been exhausted and encroachment on to the chest wall had begun. This would suggest that the patient had developed a specific sensitivity to adrenaline, localized to the area of injection and affecting the blood vessels. This is in accord with Delaunay *et al.*, who considered, from their experimental work with guinea-pigs, that the skin reactions were of an allergic nature.

Summary

A case of necrosis of the skin after prolonged self-administration of adrenaline by injection, in an asthmatic patient, is described.

Trauma, which was a possible causative factor in some of the cases reported, did not seem to play a part in this case.

It is suggested that an allergy to adrenaline developed after repeated injections over a long period and that this is in accord with the experimental findings of Delaunay *et al.*

REFERENCES

- Delaunay, A., Delaunay, M., and Lebrun, J. (1948). *C.R. Acad. Sci., Paris*, 227, 314.
 Hanke, H. (1936). *Chirurg.*, 8, 684.
 Robertson, C. K. (1951). *Edinb. med. J.*, 58, 555.
 Urbach, E. (1936). *Med. Klin.*, 32, 769.

Medical Memorandum

Torsion of a Mesenteric Lymphatic Cyst

Intra-abdominal lymphangiomas or lymphatic cysts seem to occur most commonly in the great omentum, and it is extremely rare for them to develop in the mesentery (Macnab and Menzies, 1950). As they are usually discovered accidentally during an exploratory laparotomy, the following case is of interest.

CASE REPORT

Abdominal pain began at 3.30 p.m. on October 2, 1951, in a boy aged 3½ years. After a normal bowel action the pain disappeared, but it came back at 8 o'clock the same evening. The child cried throughout the night and complained of pain in the abdomen and back, and said that he could not sit up in bed. He did not vomit but his appetite was poor. He also complained of pain in the abdomen while passing urine, and, although this was clear, his mother noticed that it had a strong odour.

The child was admitted to hospital at 2 p.m. on October 3 and was obviously ill. His temperature was 100.4° F. (38° C.), pulse rate 140, and respirations 28. Abdominal examination revealed some tenderness and rigidity on the right side, mainly below the umbilicus. The tongue was coated and a little "smelly." Rectal examination revealed some tenderness on the right side of the pelvis. The heart, lungs, and nervous system showed no abnormality, and the urine was normal. The history and physical signs at this stage suggested an acute appendicitis. A few hours later the abdomen became completely rigid on both sides, more so below the umbilicus, and a laparotomy was decided upon.

Operation.—As soon as the child was under the anaesthetic a swelling in the abdomen was visible to the naked eye. This was about 3 in. (7.5 cm.) in diameter, was hard, and was freely movable in all directions. Its position was approximately central in the abdomen, and a hand could be placed beneath it above the symphysis pubis. A right paramedian incision was made and the peritoneum was opened. A small amount of serous effusion was found, together with clots of fibrinous exudate, which appeared to be mainly present on the common and external iliac vessels on the right side. The appendix appeared normal. The swelling was seen in the hypogastrium and looked tense and purplish in colour, and on its delivery through the wound it underwent a spontaneous untwisting. It appeared to be a multilocular cyst in the mesentery of the ileum, approximately 2 ft. (60 cm.) from the ileo-caecal junction. The cyst was in actual contact with the intestinal wall, enveloping the ileum on three sides in a U-shaped manner. It did not extend into the retroperitoneal tissues, nor was there any evidence of communication between it and the mucous lining of the intestine. The locules intercommunicated, and contained a blood-stained clearish fluid, together with blood clots and flakes of fibrin; the walls of the cyst except those adjacent to the ileum were excised, and the cut edges of the mesentery brought together with interrupted catgut sutures. There was no evidence of intestinal obstruction, the colour of the ileum improving after the untwisting.

A course of "distaquine" penicillin and "cremomerazine" was given, the clips being removed on the fifth day, and the child began to take a normal diet. Recovery continued uninterrupted.

The section showed a cyst wall composed of fibro-elastic tissue and lined by a single layer of flat endothelium. The wall showed congestion, degeneration, and polymorphonuclear and round-cell infiltration. The pathologist stated that the appearance was that of a strangulated lymphatic cyst of the mesentery.

COMMENT

Considering the clinical aspects of mesenteric cysts as a whole, Aird (1950) states that usually the only sign is that of a floating abdominal tumour, which is painless unless the cysts become infected from the bowel, when they lose their mobility and adopt the features of a well-localized abdominal abscess. In this case there was no infection, and the tumour was not palpable before the anaesthetic was given. Macnab and Menzies (1950) say that these cysts do not produce a constant clinical picture. They may present as an abdominal catastrophe, as in this case. Severe pain, vomiting, and abdominal rigidity may predominate, or there may be just an ill-defined malaise. The history of each case seems to be determined by the complications which have occurred. One-third of the cases produced intestinal obstruction (Waters, 1946). The cysts may undergo torsion, as in this case, or produce an intestinal volvulus. They may rupture into the peritoneal cavity and simulate acute peritonitis, or ruptured tubal gestation in women. They may become infected and present as an acute appendicitis or diverticulitis.

Regarding their aetiology, Lord Moynihan (1897) stated that they were simple dilatations of lymphatic vessels. Illingworth and Dick (1949) favour the view that they are dilatations of lymph vascular networks present in embryonic life, like cystic hygroma in the neck.

My thanks are due to Mr. P. H. Merlin, consultant surgeon, for permission to publish this case.

N. V. ADDISON, M.B., Ch.B.,
Dewsbury General Hospital.

REFERENCES

- Aird, I. (1950). *Companion to Surgical Studies*, p. 568. Livingstone, Edinburgh.
 Illingworth, C. F. W., and Dick, B. M. (1949). *Textbook of Surgical Pathology*, p. 554. Churchill, London.
 Macnab, I., and Menzies, T. (1950). *Brit. J. Surg.*, 37, 294.
 Moynihan, B. G. A. (1897). *Ann. Surg.*, 26, 1.
 Waters, E. G. (1946). *Amer. J. Obstet. Gynec.*, 52, 478. Quoted by Macnab and Menzies (1950).