not occur. Because reflexes and respiration were not depressed it was considered that post-operative nepenthe could safely be administered.

Bourne (1954) noted amnesia among patients who received methylpentynol in labour. It was hoped that in this series an amnesic effect might be observed, or at least that the patient's recollection might be pleasant. However, a strong impression emerged, as a result of questioning by a health visitor after their discharge home, that many of the children retained a vivid and unpleasant recollection of the application of the mask or of the prick of the thiopentone injection.

Three children who, without the anaesthetist knowing their identity, received a specially prepared "inert" elixir from which the methylpentynol had been omitted, were frightened and crying. They were so different from the majority of oblivon-premedicated children that it was clear that methylpentynol itself was the effective constituent in the oblivon elixir.

Assessment of the Value of Methylpentynol

Ideally, premedication for tonsillectomy would be pleasant to receive, easy to administer, would induce sleep without restlessness or loss of muscle tone, and might have further advantages, such as analgesic, amnesic, or anti-emetic properties. It would be non-toxic and would not depress respiration or the protective laryngeal or cough reflexes.

Oblivon elixir was pleasant to take and easy to administer. It seldom induced sleep, but rather a calm and happy frame of mind that seemed to justify the description "anti-jitter drug" used by the popular press. Muscle tone was unaffected. Pre-operative restlessness following the premedication was entirely absent. No undesirable effects were observed apart from vomiting, which was projectile and was accompanied by an active protective reflex as if the premedication had been atropine alone. Respiration was not depressed.

Methylpentynol fell short of the ideal in the following ways. Most children were not asleep, amnesia did not occur, and therefore the patients were conscious of and remembered the induction, which they did not like. Also, they saw what went on in the ward. Of the 152 children, 22 were unhappy. Vomiting was not unusual during the induction. After operation there was need of sedation as often as after barbiturate premedication, so that methylpentynol, like barbiturates, appeared to be without analgesic properties.

Nevertheless the advantages are many. In restful surroundings the results might have been better, and in the not ideal conditions of this investigation it proved generally successful, and was liked by the ward staff and anaesthetists. Because the failures included the children who were least amenable to discipline, it was regarded as unsuitable for the ill-behaved, the frightened, or the handicapped child, for whom, at present, a barbiturate would be the premedication of choice. Indeed, so strong is the preference here for the children to be asleep when they come to the anaesthetic room that, since this investigation, barbiturate premedication has been resumed. It is not forgotten, however, that this might be dangerous if the nursing position were not satisfactory (Barnes, 1952). I believe that, because of the active reflexes, methylpentynol is a safe answer to the problem of tonsillectomy premedication wherever there is a shortage of nurses, but that the ideal premedication has yet to be found.

Summary

Methylpentynol (oblivon) and atropine were given for pre-anaesthetic medication to 152 children before tonsillectomy. It successfully diminished pre-operative apprehension in 130 cases and in 17 it was partially successful. Only in 5 was it a failure.

The drug was readily acceptable to patients, and toxic or unpleasant side-effects were not observed in this series.

Protective reflexes were not depressed and post-operative restlessness was but slight. The difficulties of

nursing care were consequently reduced. Evidence on amnesia was incomplete, but the impression was gained that it did not occur to any marked extent.

I wish to thank Dr. B. White and Dr. J. Oliver, who kept careful records of the children they anaesthetized, the nursing staff who looked after the children, and the health visitors who helped with the follow-up, also British Schering Limited for their valuable help and co-operation.

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SUBACUTE OEDEMATOUS NEPHRITIS TREATED WITH MALARIA

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A case is reported of apparent complete remission of subacute (oedematous) nephritis following malaria therapy; this case had been resistant to other forms of treatment over a period of one year.

Case Report

A boy (date of birth June 14, 1943) was first admitted to hospital in May, 1949, with a typical attack of Type I nephritis. He was kept in hospital for two months, and at the end of that time was discharged sign- and symptom-free, but with a few red blood cells still present in his urine.

He remained well until September, 1952, when he was readmitted complaining of fairly sudden onset of swollen feet and face and general malaise. On examination he was found to have moderate generalized oedema, with a normal blood pressure and no macroscopic haematuria. The urine contained 250 mg. of albumin per 100 ml. and an occasional red blood cell, but no casts; blood urea was normal and blood cholesterol 270 mg. per 100 ml.; total plasma proteins were 5.3 g. (albumin 3.1 g., globulins 2.2 g.) (electrophoresis was not carried out). A diagnosis of "subacute nephritis" was made, and the boy was treated with a high-protein low-salt diet, restricted fluids, and rest; but the oedema persisted, urinary albumin rose to 1,200 mg. per 100 ml., and the serum albumin fell to 1.8 g.%. Two months after admission he developed ascites and peritonitis, which responded to antibiotic therapy, but when these had subsided his condition was as before. He was next treated with ion-exchange resins—30 g. of kationium daily. These produced a good diuresis, and the oedema disappeared, but the albuminuria and low serum albumin persisted. He was treated as an out-patient on kationium and a high-protein diet for the next six months and remained fairly well, although he continued to pass up to 1,000 mg. of albumin per 100 ml. of urine, the serum albumin remained low, and he had slight oedema and ascites at times.

In July, 1953, his condition deteriorated again, and it was decided to try the effect of malaria therapy. At this time he had gross ascites (6 pints—3.4 litres—removed by paracentesis); his blood pressure and blood urea were normal; the serum albumin was 2.1 g.%, the blood cholesterol had risen to 560 mg. per 100 ml., and the urine contained 800 mg. of albumin per 100 ml. and an occasional red blood cell and hyaline cast.

On July 15 he was infected, by mosquito bites, with benign tertian malaria. Twelve days later he developed a

tertian fever, and malaria parasites were found in his blood. The fever was allowed to continue for 13 days, after which mepacrine was given. During the time of his infection the oedema and albuminuria increased, the blood urea rose to 165 mg. per 100 ml., and he was very ill. Sixteen days after the fever started he had a good diuresis, and two days later the blood chemistry started to return to normal. One month after the malaria the blood cholesterol had fallen to 198 mg. per 100 ml., the serum albumin had risen to 4 g.%, and the urine was free from albumin for the first time for 11 months.

Since this time the boy has been free from oedema, and his urine is completely normal. When last seen in May, 1954, the plasma proteins were 6.6 g.%, with a serum albumin of 4.2 g.%, and the blood cholesterol was 155 mg. per 100 ml. He is now back at school and extremely well on normal diet and no special treatment.

Comment

The patient was a case of oedematous nephritis, with low serum albumin and massive albuminuria developing three years after, and probably secondary to, an attack of Type I nephritis.

The treatment of oedematous nephritis with malaria was first reported independently by Byrne (1952) and Gairdner (1952); Byrne reported a complete remission in one case, and Gairdner in two out of four cases. No further cases have been written up in the literature, and therefore this apparent complete cure is reported, although it is realized that this case is only a single example, and the follow-up so far is only ten months. The explanation for the effectiveness of various infections, such as measles and malaria, in influencing the course of oedematous nephritis remains obscure.

I would like to thank Dr. C. G. Fagg for his help with this case and for permission to publish, and the Horton Laboratories, Epsom, for supplying the mosquitoes.

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Medical Memoranda

A Case of Cantharidin Poisoning

The following case is rare enough to warrant being placed on record.

CASE REPORT

A man aged 43, a keen fisherman, obtained some pure cantharidin from an illicit source with the object of attracting fish. The relevant information was all obtained from the patient before his death. He stated that he mixed the substance with water in a bottle, and, having no stopper for this, he used his thumb to occlude the opening. Cantharidin is only very slightly soluble in water (Martindale, 1952), and it thus appears that the powder floated on top of the water and was transferred to the thumb, as a result of shaking. Immediately following this, the patient handled his fishing-hooks, and in the process accidentally pricked the thumb with which the bottle had been occluded. This caused him to suck the thumb. In this way, it appears, the cantharidin was transferred to the patient's mouth.

Approximately half an hour after ingesting the cantharidin the man began to feel ill and to vomit. Shortly afterwards diarrhoea started. The vomiting and diarrhoea continued for two days, when these symptoms ceased; but next day his general condition was worse and he was admitted to hospital. There was also a complaint of abdominal and back pain and there had been some haematuria. Very little urine, however, had been passed since the day before he was admitted. On admission the patient was shocked; in fact, he was pulseless, and the systolic blood pressure was 70 mm. Hg; the diastolic pressure could not be recorded.

The heart rate was regular at 108, with no abnormal bruits. The abdomen was slightly tender all over, but there was no guarding. The pupils were dilated and fixed. There was weakness of the arm and leg muscles as a whole. Examination otherwise was negative. In spite of the usual resuscitative measures, including transfusion of plasma, the patient's condition gradually deteriorated, and he became unconscious some five hours after admission and died an hour later. The blood urea was 160 mg. per 100 ml., and the blood count showed evidence of haemoconcentration (Hb, 19.2 g.%; red cells, 6,500,000).

Necropsy showed no signs of irritation of the mouth or oesophagus. The stomach, however, was moderately injected and there were some petechiae in the pyloric antrum. There was marked injection of the whole of the duodenal mucosa, and moderate injection of the first 12 in. (30 cm.) approximately of the jejunum and of all the terminal ileum; there was, however, no mucosal ulceration. The remainder of the intestinal tract was normal. The kidneys appeared normal macroscopically. The bladder contained a small volume of heavily blood-stained urine, and its mucosa presented a moderate number of petechiae. All other organs and parts appeared normal. Microscopically, sections of the kidneys revealed acute tubular necrosis. The stomach contents, half the liver, one kidney, and the small quantity (approximately 2 oz.—57 ml.) of urine present in the bladder were all subjected to chemical analysis for various irritants, including cantharidin. The results were, however, entirely negative. The small-intestine contents were examined bacteriologically post mortem, and no pathogenic organisms, whether salmonellae, dysentery organisms, staphylococci, or *Cl. welchii*, were isolated.

COMMENT

Cantharidin is the alkaloid contained in cantharides (Spanish fly), and it was the pure alkaloid that the deceased handled in this unfortunate accident. The fatal dose of pure cantharidin is about $\frac{1}{2}$ gr. (32 mg.) (Leschke, 1934).

The quantity which the deceased obtained and which he tried to dissolve was 1 gr. (65 mg.). It thus appears that the greater part of 1 gr. (65 mg.) was transferred to his mouth via his thumb. Cantharidin is absorbed from all surfaces, including the skin (Cushny, 1947). The alkaloid was probably not absorbed through the skin of the thumb, owing to the short time of contact. Judging from the post-mortem appearances, it was no doubt mainly absorbed from the stomach and small intestine. It would appear that none was absorbed from the mouth, as the buccal mucosa showed no signs of irritation.

The absence of signs of irritation in the mouth and oesophagus is somewhat surprising, but this is probably due to the insolubility of the alkaloid, and because it was quickly swallowed in the saliva. In reference to this, Cushny (1947) states that blisters arise in the mouth and throat if the drug is taken in solution.

The pathogenesis of the shock is uncertain, but one may postulate that it was due partly to the direct action of cantharidin and partly to the resultant pain. Cantharidin has an important action on the internal organs by which it is eliminated (Cushny, 1947), and it would thus seem reasonable to expect reflex action from these organs while in a state of irritation, the result of which would be shock.

There is little doubt that the acute tubular necrosis was mainly due to the direct toxic action of the drug. It is possible, however, that the toxic action was aggravated by shock, which results in diminished renal blood flow.

Perhaps the main interest of the case, however, is in relation to the negative analysis of the specimens mentioned. There would seem to be two reasons for this. In the first place, during the three-day period between ingestion and death some of the ingested alkaloid must have been excreted. In the second place, the only test available is a biological one, which is relatively crude and only able to detect 1/100 gr. (0.65 mg.) (Taylor, 1948). The fatal dose, however, is $\frac{1}{2}$ gr. (32 mg.), and, even if the whole of the