may cease to vomit throughout her stay in hospital, thus testing the credulity of her medical attendant.

A radiologist needs skill and experience to demonstrate a hiatus hernia. Resolution is rapid in the puerperium, and attempts to make a post-partum diagnosis may be unsuccessful because of the diminution in size of the hernia, or even its disappearance. Rigler and Eneboe (1935), Bourgeois and Hood (1949), and Schnepf (1943) all commented on this feature, our experience of which has been similar.

It is not intended to claim that hiatus hernia always causes trouble in pregnancy, or that such a hernia is always responsible for heartburn, vomiting, or haematemesis. We have seen cases illustrating the contrary.

It would seem that there is a need for a large-scale investigation to ascertain the role of hiatus hernia in heartburn and vomiting of pregnancy.

Summary

The association of hiatus hernia with pregnancy is described.

Nine cases with symptoms attributed to a hiatus hernia in pregnancy are reported.

The literature is briefly reviewed.

The need for further investigation is recognized.

We wish to thank Dr. J. M. Naish, Mr. W. M. Capper, Mr. P. Phillips, and Professor H. J. Drew Smythe for permission to publish these cases, Professor G. Gordon Lennon for helpful advice and criticism, and Dr. G. R. Airth, who performed most of the x-ray examinations.

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In his annual report the Medical Director of the Central Middlesex Hospital, Dr. Horace Joules, states that despite efforts to reduce the surgical waiting-list it still stands at well over 1,000. This number had been somewhat lessened by the co-operation of several other hospitals which had taken over large numbers, but last winter's fog and the subsequent high incidence of influenza had caused such a demand for acute admissions that the number waiting for surgery had risen to its previous height. Dr. Joules said that it was known that several London hospitals had practically no waiting-list, and he suggested that the time had come to evolve some system of transfer of cases for elective surgery between one hospital and another. A committee had been set up to inquire into the out-patient position, and had agreed that any further increase in numbers must be avoided. Closer association between practitioners and the hospital had been maintained by meetings of local health liaison committees and clinical meetings and courses. The opening of a new mass x-ray unit, domiciliary visiting, and the provision of additional beds had ensured early treatment of new cases of pulmonary tuberculosis. The association with the Middlesex Hospital had been strengthened by an agreement to continue undergraduate teaching at the Central Middlesex Hospital for a further 10 years, and by a scheme to exchange senior registrars after they had two years' experience in their own hospital.

TREATMENT OF TETANUS

BY

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In an article on tetanus successfully treated with gallamine triethiodide ("flaxedil") Smith and Thorne (1952) advocate the use of this drug. They state that relaxation is secured on a steady level and that respiratory depression is less marked with gallamine triethiodide than with D-tubocurarine, especially in the conscious subject. It is to be noted, however, that the period elapsing between the infecting injury and the onset of symptoms in their case was at least ten days, so that the prognosis would be relatively good.

Recently we have had in this hospital two cases of severe tetanus in children in which the periods elapsing between injury and the onset of symptoms were under a week, being in one case four days and in the other six days. Both of these children died, one in 24 hours and the other in three days, despite treatment with gallamine triethiodide and the usual treatment with sedation, antitoxin, and antibiotics. Gallamine was not conspicuously successful in either of our cases in relieving spasm, although used in much the same doses as in the case of Smith and Thorne, and, in addition, we found it apt to cause respiratory embarrassment.

Case 1

A girl aged 4 was admitted to Grey Hospital on December 12, 1952. The mother stated that the child had cut her left thumb in the garden on some glass six days previously. She now complained of neck stiffness and was unable to open her mouth. On the morning of her admission facial spasm became apparent. On examination the pulse was 120 and the temperature 98.4° F. (36.9° C.), although this rose to 102° F. (38.9° C.) within a few hours. The mouth could not be opened more than about 0.5 cm. Risus sardonius was present. Some stiffness of the muscles of the back was apparent, and within an hour of admission two spasms occurred. On the child's left thumb a deep infected laceration was seen.

A diagnosis of tetanus was made and 20,000 units of anti-toxin was given, followed by a further 60,000 within six hours. Crystalline penicillin in doses of 500,000 units, later increased to 1,000,000, was given six-hourly. As further spasms were occurring an intravenous saline drip was set up and 5 mg. of gallamine was given intravenously and 20 mg. intramuscularly. This caused a temporary cessation of respiration, and mucus had to be removed with a suction apparatus. The pulse remained steady throughout this episode. Oxygen was given by nasal catheter, and the child recovered sufficiently to talk. About one hour later two further tetanic spasms occurred, which necessitated the addition of 1 ml. of thiopentone to the drip, and gallamine was required. Despite this, several convulsions occurred. As additional sedation 30 ml. of alcohol was introduced into each vacoliter, limited to two vacoliters daily. On the third day (December 15) the child had an exceptionally severe convulsion and died. Immediate restorative measures failed, as also did cardiac massage for one hour. Throughout, the child was "specialised" by the medical staff.

A total of 27 ml. of thiopentone and 350 mg. of gallamine was given in the three days that the child lived. In addition 4.5 ml. of paraldehyde was also given, and intravenous alcohol. Despite this treatment she had convulsions of more or less severity, on an average twice or three times an hour. Respiratory embarrassment occurred seven times, and on

two occasions artificial respiration was necessary. Oxygen was often required. Mucus in the air passages was very troublesome and required frequent suction.

Some 180 mg. of gallamine was given intramuscularly and 170 mg. intravenously; the doses varied from 5 mg. intravenously to 20 mg. intramuscularly. *Clostridium tetani* was grown from swabs taken from the wound when it was cleaned.

Case 2

On January 22, 1953, a boy aged 7 was admitted to Grey Hospital. He was quite rigid, was unable to open his mouth, and was perspiring freely. He complained of abdominal pain, and the muscles of the back were very rigid and in spasm. His parents gave a history of his having jumped on to a spike of wood in the grass four days previously. The wound had healed. The boy was quite conscious; his temperature was 99.2° F. (37.3° C.), and pulse 140. He was given 40,000 units of antitoxin, and as clonic spasms were almost continuous a slow intravenous saline drip was set up and 40,000 units of antitoxin and 80 mg. of gallamine were introduced into each vacoliter. In addition 1,000,000 units of penicillin was given four-hourly. Thiopentone, 7 ml., was given as an initial sedative into the tubing of the drip. A dose of 80 mg. of gallamine in the first vacoliter and 40 mg. in subsequent vacoliters was decided upon. Later it was found necessary to give additional gallamine intravenously, the dose being relatively small. Later it was found necessary, however, to increase the dose of gallamine to 80 mg. and finally to 120 mg. in each vacoliter.

Atropine sulphate, 1/200 gr. (0.32 mg.) intravenously, had previously been administered, but even so his breathing became very bubbly. A further 1/200 gr. (0.32 mg.) of atropine was given. For the first few hours the convulsions were relatively few, but as time went on they increased in number and severity, so that 10 hours after admission he was having almost continuous clonic convulsions, and anaesthetic doses of thiopentone were required. Although he was in hospital for only some 23 hours before he died, he had numerous mild and many severe spasms. A total of 29.5 ml. of thiopentone and 404 mg. of gallamine was given intravenously in an effort to suppress his convulsions. This in addition to antitoxin, 80,000 units, and penicillin, 1,000,000 units four-hourly. Although his breathing was very bubbly, respiration was not arrested and no artificial respiration was required. The boy died the morning after admission, death being due to sudden heart failure.

Discussion

These two cases do not make impressive reading. They tend to bear out the axiom that tetanus occurring within a week of injury is invariably fatal. In the first instance we had the impression that gallamine caused some respiratory embarrassment, but this was not confirmed in the second patient, who was, however, desperately ill on admission.

Abel (1934), in a study of the path of conduction of the toxin to the central nervous system, indicates that this occurs by way of the blood stream. He also suggests that the tetanus toxin is altered into or liberates in the cord a substance which has a lethal effect on the vital centres.

The dose of sedatives could not be reduced in either of these two cases without causing severe suffering. Penicillin, even in doses of 1,000,000 units four-hourly, did not seem to affect the course of the disease. Antitoxic serum in doses of 80,000 units in the first twelve hours likewise seemed to have little effect.

It can only be concluded that the present methods of treatment of tetanus in cases occurring within a week of injury are ineffective, and that, in view of the fact that 35 cases of tetanus occurred in New Zealand last

year, recourse should be had to the routine active immunization of all children against tetanus.

I bring these cases to the notice of the public health authorities, both in the United Kingdom and in New Zealand, as so often in minor injuries one is in doubt whether the injury requires a prophylactic injection of antitoxin or not. In view of these two fatal cases it would seem to be worth while to include antitetanic inoculation at the same time as routine immunization against diphtheria is being carried out.

My thanks are due to Dr. B. M. Dallas, Dr. E. E. Tilson, and Mr. S. Barclay, the surgeon superintendent—the last-named for his efforts at resuscitation of Case 1. I also thank Mr. B. Heine and Mr. R. D. Lockhart for their constant attention to these cases.

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Medical Memoranda

Stasis of the Large Bowel Secondary to Acute Cholecystitis

It is generally recognized that acute inflammation of the gall-bladder may be accompanied by upsets of large-bowel function leading to distension and constipation; the extreme degree to which distension may proceed, simulating large-bowel obstruction, is worthy of greater emphasis than it usually receives, and is well illustrated by the following two cases.

CASE 1

A married woman aged 72 had been operated on four months previously for a strangulated right inguinal hernia, and had made a smooth recovery. Two days before her present admission she had had an attack of vomiting, during which she had been examined at a London teaching hospital but had not been detained. She complained of abdominal pain of two days' duration which was situated mainly in the right side of the abdomen. There was anorexia and she had passed neither faeces nor flatus for three days.

On examination her temperature was 101° F. (38.3° C.), pulse 110, and blood pressure 130/80. The tongue was furred. The abdomen was distended, with maximal and marked distension in the right flank; the caecum was palpable, and above this was a tender mass. Rectal examination was negative. A plain x-ray film of the abdomen showed much distension of the caecum and ascending colon. The diagnosis was thought to lie between an attack of acute cholecystitis and a perforated carcinoma of the ascending colon; in view of the attack of vomiting two days earlier the former was considered more likely.

Operation.—A right paramedian incision was made. The caecum and the ascending colon were distended to at least twice their normal size, but there was no organic obstruction. The distension extended to that portion of the ascending colon which lay in contact with an acutely inflamed distended gall-bladder; gall-stones were present. Cholecystectomy was performed and the abdomen closed with drainage. The patient made an uneventful recovery.

CASE 2

A married woman aged 80 had had attacks of abdominal discomfort associated with distension and relief by the passage of flatus during the past year. She had had abdominal pain for three days; the pain was mainly in the lower abdomen and was described as being "windy" in character. She was constipated and had not passed flatus for three days. Her abdomen felt as if it had become "blown-up." There had been some retching but no vomiting.

On examination her temperature was 98° F. (36.7° C.), pulse 112, and respirations 24. The tongue was moist.