the persistent pain in the epigastrium and in the back, to the right or left of the lower dorsal spine according as the ulcer is duodenal or gastric. The pain, though constant, is made worse by nourishment, and may necessitate the use of opium, especially at night. Frequently there are repeated haemorrhages. The gaunt, haggard, and anaemic facies of the patient is a characteristic feature. In my experience many of these patients respond very poorly or not at all to the careful medical treatment of my medical colleagues, but a well-planned operation gives immediate and complete relief which, with reasonable after-care, is, I believe, lasting. But apart from such a severe type as this it is not possible to lay down hard-and-fast indications for surgical treatment in the uncomplicated ulcer. We have to consider not only the essentially medical factors—that is, the clinical and radiographic features and the responsiveness of the ulcer to medical treatment—but also the economic and social circumstances of the patient.

A really prolonged course of treatment, to be followed by regulated diet and habits, is an ideal not often realizable by patients of the hospital class, hence the appeal of surgery, with its prospect of a more rapid cure and a reduced risk of relapse under normal conditions of life to this particular class. Without doubt this is the chief reason for the large proportion of ulcer cases in the surgical wards of the Manchester Royal Infirmary. Another factor that enters into the question is the surgeon's faith in his own methods—a faith to be derived and proved from his experience, and not from his impressions.

THE PROPHYLACTIC TREATMENT OF PATIENTS WHO HAVE HAD ALBUMINURIA IN A PREVIOUS PREGNANCY.*

BY

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I HAVE been stimulated to make this preliminary communication on the prophylactic treatment of cases which have had albuminuria in a previous pregnancy by papers by Young and Gibberd. These writers have shown that a large number of cases of albuminuria of pregnancy are followed by permanent renal damage. I must emphasize that this is only a preliminary communication, and the method of prophylactic treatment outlined is still in the experimental stage, but I hope that the details of the cases we have treated will stimulate others to impress on all patients who have albuminuria of pregnancy the necessity in any subsequent pregnancy of placing themselves under expert care at the very earliest moment.

At Queen Mary's Hospital for the East End, where this investigation is being carried out, we have always explained to every patient the urgent necessity of reporting immediately a period is missed, and the majority of patients becoming pregnant again after albuminuria or eclampsia have come under observation at six to ten weeks after the commencement of the last menstrual period. The investigation has been carried out in collaboration with Dr. A. A. Osman, physician to Queen Mary's Hospital for the East End, and Dr. H. G. Close, working for the Medical Research Council.

The theory on which this investigation is based is the result of an extensive examination carried out by Dr. Osman for the Medical Research Council on cases of scarlatinal nephritis, and the essential feature is maintaining the reaction of the urine throughout the whole of pregnancy at a minimum alkalinity of pH 7.7. In order to achieve this it is often necessary to give quite large doses of alkalis by the mouth. To guard against overdosage it is advisable to estimate the bicarbonate content of the blood plasma, and this is done by the method of Van Slyke, Stillman, and Cullen, described in the *Journal of Biological Chemistry* in 1919. This estimation must be repeated at intervals, especially if any change in the original dose is indicated. In normal non-pregnant women the average plasma bicarbonate is about 0.030 molar concentration. In

The scope of this paper is not intended to include a consideration of surgical technique, but recently so much has been written and spoken about the value of gastro-enterostomy in the treatment of duodenal ulcer that a brief allusion may be made to this subject. Many surgeons, probably a considerable majority, regard gastro-jejunostomy as the best operation for duodenal ulcer. My own experience has led me to prefer pyloroplasty—either of the Finney or Horsley type, but when possible the former—combined with excision or cauterization of the ulcer. I believe this operation gives results as good as the best after gastro-jejunostomy, but without entailing the liability to such a grave, if infrequent, sequel as gastro-jejunal ulcer or to the less serious troubles met with after gastro-jejunostomy for duodenal ulcer. Since the foregoing remarks about gastro-jejunostomy for duodenal ulcer were written, the late results in 331 duodenal ulcer patients, on whom gastro-jejunostomy had been performed at the Manchester Royal Infirmary at least five years before the inquiry, have come to hand, and it is noteworthy that 15 per cent. of the patients were found to complain of "slight symptoms" and 13 per cent. of "very definite symptoms."

The inquiry into the late results of gastro-enterostomy which is being conducted at the present time by the British Medical Association throughout the whole country should afford some valuable information about the position of this operation in the treatment of duodenal ulcer, and it was in furtherance of this inquiry that the figures I have just quoted were obtained.

85 per cent. of pregnant women there is considerable reduction, an average being about 0.0247. This blood analysis is somewhat intricate, and cannot be carried out without proper laboratory facilities. The reaction of the urine can easily be ascertained in a very few minutes by colour comparisons with standard phosphate mixtures, using methyl red and brom-thymol blue as indicators. We have found that the dose which is usually both safe and effective is about 400 grains a day of equal parts of sodium bicarbonate and potassium citrate. This may have to be varied according to the reaction of the urine and the bicarbonate content of the plasma. In some cases we have had to give as much as 780 grains—over an ounce and a half a day—while in others the dose may be reduced to a drachm or two a day.

The patient is advised to diet. The protein intake is reduced by curtailing the amount of meat, milk, and eggs. Milk is allowed in tea, coffee, and milk puddings, but is not allowed as a beverage. Eggs are not allowed in quantity, but one egg may be taken every other day. Meat of all sorts, and particularly red or greasy meat, is to be taken sparingly, and only every other day. White fish (not salmon, mackerel, etc.) may be taken freely, and vegetables and fruit *ad lib.*

As regards general hygiene, special attention should be paid to the bowels, and a free action daily must be ensured. Fresh air and gentle exercise are of importance, and at the same time the patient must take plenty of rest and avoid all strenuous exertion.

I will now relate case details of fourteen patients, some of whom have been on a modified treatment.

CASE I.—First pregnancy in 1925. Emergency, after delivery with post-partum eclampsia. Second pregnancy in 1927. Under observation from tenth week. Small doses of alkali only. No albumin. Live baby at term. Third pregnancy in 1929. Under observation from seventh week. Small doses of alkali only. Patient was found to have threadworms, for which she was treated. No albumin. A normal healthy-looking baby died during labour at term. There was no post-mortem examination.

CASE II.—First pregnancy in 1923. Admitted after delivery with post-partum eclampsia. Second pregnancy in 1925. Under observation from eleventh week. Small doses of alkali only. Albuminuria. Premature baby stillborn. Third pregnancy in 1928-29. Under observation from twelfth week. Full alkali treatment (400 grains). No albumin; no oedema. Macerated foetus.

CASE III.—First pregnancy in 1924. Eclampsia. Second pregnancy in 1927-28. Under observation from sixth week. Full alkali treatment (400 grains). No albumin. Live baby at term.

CASE IV.—First pregnancy normal. In the second pregnancy albuminuria and oedema were present. In the third the patient was on full alkali treatment from the twelfth week. No albumin; no oedema. Live baby born at term.

CASE V.—In the first pregnancy the patient suffered from eclampsia. In the second pregnancy she was under observation

* Read in the Section of Obstetrics and Gynaecology at the Annual Meeting of the British Medical Association, Manchester, 1929.

and alkali treatment from the tenth week. There was a trace of albumia at the twenty-second week. Alkalis were increased up to 720 grains a day. Albumin disappeared. Live baby born at term.

CASE VI.—First pregnancy in 1927. Albuminuria. Premature twins born alive. Second pregnancy in 1928-29. Under full alkali treatment from the sixteenth week. No albumin; no oedema. Live baby at term.

CASE VII.—Patient had nephritis at the age of 10. Albuminuria and oedema were present before pregnancy. She was under observation from the fourteenth week. She was given 400 grains a day, later reduced to 150 grains a day. No albumin; no oedema. Live baby at term.

CASE VIII.—In the first pregnancy eclampsia was present. Baby stillborn. During the second pregnancy the patient was on alkali. No albumin until two days before delivery, when a trace was found. Live baby at term.

CASE IX.—First pregnancy: albuminuria present. Premature baby weighing 3 lb. 2 oz. born alive; lived two days. In the second pregnancy patient was under observation from the twelfth week. Small amounts of alkali only. No albumin. Live baby at term (6 lb.).

CASE X.—First pregnancy in 1925-26. Admitted with gross albuminuria. Live baby. Second pregnancy in 1927. Under observation from the eighth week. Small amounts of alkali only. No albumin. Live baby at term.

CASE XI.—First pregnancy in 1925-26. Admitted with gross albuminuria. Premature baby weighing 3 lb. 8 oz.; lived four days. Second pregnancy in 1927. Under observation from the tenth week. Small amounts of alkali only. No albumin. Live baby at term.

CASE XII.—First pregnancy in 1921. Admitted with eclampsia. Baby stillborn. Second pregnancy in 1925. Under observation from the fourteenth week. Small amounts of alkali only. No albumin. Live baby at term.

CASE XIII.—First pregnancy ended by miscarriage about the twenty-fifth week. Albuminuria; blindness. The second pregnancy was a repetition of the first. In the third pregnancy patient was under observation from the twelfth week. Full alkali treatment—150 grains, increased to 350 grains. No albumin. Live baby at term.

CASE XIV.—First pregnancy normal. In the second pregnancy albuminuria and oedema were present during the last two months. Premature baby born alive. In the third pregnancy the patient was under observation from the twenty-sixth week. She was given 400 grains, increased to 500 grains daily. No albumin or oedema. Live baby at term.

GAS-OXYGEN IN MIDWIFERY.*

BY

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For many years past I have thought that the statement "Pregnant women stand chloroform well" was a mistake—merely copied from one book to another. I felt that it was obviously wrong to give a woman at the time of the birth of her child an anaesthetic so potent, so toxic, so dangerous as chloroform; but it was the accepted idea which had been handed down to us from the late Sir James Y. Simpson, and so it was a sort of gospel that is believed in even now, although there have been a very large number of fatalities—fatalities which will continue so long as this method is employed.

In this communication I propose to put before you a newer and, I think, a better idea—it is the administration of gas and oxygen for childbirth. This method has been familiar to me for some time from the literature of anaesthetics in Canada and the United States of America, but it was not until 1921 when, as the representative of the Anaesthetics Section of the Royal Society of Medicine, I went to Canada and the United States, that I first had personal and practical knowledge of it. I should like here and now to say that my introduction to this most valuable method was due almost wholly to Dr. Wesley Bourne of Montreal. The method has both advantages and disadvantages, and I propose to deal with them in that order.

Advantages.

1. The patient is given gas and oxygen with every pain—and after a few minutes she learns to ask for the mask as a pain is starting; she soon finds out that a few breaths of gas and oxygen will greatly diminish her pain, and when she realizes that she can go on having it, and that it will not slow her labour or hurt either herself or her baby, she is delighted.

2. The gas and oxygen, being non-toxic, can be given for a very long time without any harm to the mother or child—provided always that cyanosis is never allowed to be present. (My longest case so far has been eleven and a half hours.)

3. As this anaesthetic is non-toxic, it follows that the mother and the child have less to eliminate afterwards than if they are given chloroform. In connexion with this I well remember a case when the mother and child were both yellow for many days after a long chloroform administration, and yet with her next baby the mother refused to have the newer and, in my opinion, better anaesthetic.

4. The anaesthetist can greatly reduce the obstetrician's work, for if he knows enough of midwifery he need not send for the obstetrician until about an hour before the child is born. This is a point that I commend to the notice of the obstetricians.

5. The patient soon gets to an analgesic state, and between the pains is quite conscious, and indeed in some cases inclined to be talkative.

6. Finally, towards the end of the confinement, when the head is on the perineum, a little ether can be turned on, and the patient rendered completely unconscious, then, as the head is born, the ether is shut off, likewise the gas, and a mixture of CO₂ + O (1 to 6) is given; this increases the respirations of the mother both in rate and amplitude, and as a result the baby becomes rosy pink and begins to "give tongue."

7. After the child is completely delivered, it is quite easy to deepen up the anaesthesia for the delivery of the placenta, and in my experience women who have had this form of analgesia plus anaesthesia recover consciousness very soon; and long before one can pack up one's things and leave they are quite conscious and full of gratitude, especially those who have had chloroform for their previous confinements.

Disadvantages.

1. A special anaesthetist has to be present, and one who knows the method. It is not a method for one man to do both anaesthetic and confinement.

2. He must have an apparatus suitable for the occasion. The obstetric sets can be hired at a small charge for the use of the machine, and when returned to the makers they see how much of the gases have been used and charge for them as well.

3. The anaesthetic is naturally more costly than when chloroform is given.

The impression left on my mind by the cases that I have attended is that the pains are by no means slowed; indeed, I think that in some cases, where plenty of oxygen has been used, the pains seemed to be increased both in frequency and in strength. This, however, is merely my impression. I cannot prove it. There is one point, however, that I am sure of, and it is that the patients are far less exhausted, even after a long labour, with gas and oxygen than they are after chloroform; moreover, they recover much more quickly.

It is essential to remember that throughout the whole administration the patient must be kept pink. Cyanosis should never be present, since if allowed for any time the life of the child will be endangered.

I prefer to start the anaesthetic at the commencement of the second stage of labour, but if the patient is a nervous primipara then it can be started before. My usual custom when I begin is to have the gas-bag nearly full of gas and oxygen in the proportion of about 4 to 1, and to tell the patient to take three or four big breaths, and then to hold her breath. She will then feel a sort of pleasant feeling of well-being permeating the whole body, and the pain will be dulled. It is only necessary to give the gas and oxygen with each pain; it should not be given continuously. Later on, when the expulsive pains begin, the patient is told to take four or five big breaths and then strain down. They know a pain is on, but, as they are analgesic, they will obey instructions and strain down.

Care must be taken to see that when the head is on the perineum the expulsive pains are under proper control. By this I mean that the patient must be quiet, and to do this, as I said before, a little ether is mixed with the gas.

* Read in the Section of Anaesthetics at the Annual Meeting of the British Medical Association, Manchester, 1929.