OBSTETRICS IN GENERAL PRACTICE

Toxaemia of Pregnancy

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Toxaemia of pregnancy is the commonest obstetric abnormality encountered in family practice and its successful treatment depends on the closest and most cordial understanding and co-operation between the patient, the general practitioner, and often also the consultant obstetrician. It is not enough that the pregnancy should result in a live baby and a live mother, for a mother who looks back on her pregnancy as an unhappy one and is afraid of the future may influence the attitude of others in a street or village for many years. Moreover, a young child deprived of its mother, even if only for a few weeks and for the best of textbook reasons, may still develop behaviour problems.

Under good domestic conditions and with the fullest co-operation much can be done to cope with the milder and commoner forms of toxaemia of pregnancy, particularly those in which the abnormal signs are not manifest until after the 34th week. Although severe toxaemia, especially if there is a background of essential hypertension or previous renal disease, necessitates hospital admission, many cases of toxaemia can be dealt with by the general practitioner with adequate support and advice from his hospital colleagues. Their management is most easily described by considering an imaginary case in a primigravida.

Illustrative Case

A young woman has been married for two years to an assistant master in the local secondary school. She is 25 years of age, 5 ft. 5 in. (1.6 m.) in height, and weighs about 9 stone (57 kg.). At first they avoided pregnancy, in a small furnished flat, but they recently bought a new house into which they hope to move within the next few months and have therefore embarked upon a first pregnancy. Since there is no history of any significant illness and nothing in the family history to indicate any special risk, her doctor suggests that she should have her confinement at home under his care.

First Six Months

The first few months are uneventful. Her last menstrual period was on 5 August, her expected date of confinement is therefore 12 May, and, having been warned of the importance of making a note of the first date of foetal movements, she says that they were first definitely noted on 14 December, though perhaps a slight flutter was felt a week earlier. When she is first seen, at about the tenth week of her pregnancy, her blood-pressure is 120/70. During the next few months it falls to a minimum of 110/70. At the 24th week it is again 120/70. During this first six months her total weight gain is just over 14 lb. (6.4 kg.), with a maximum of 4 lb. (1.8 kg.) in one period of four weeks which included Christmas.

Abnormal Signs

At the 34th week it is noted that in the last three weeks she has gained 5 lb. (2.2 kg.) and that her blood-pressure is 130/85. There

is no visible oedema, but her wedding-ring is rather tight. She feels well and is eating and sleeping normally and is about to move into the new house. Two weeks later her blood-pressure is 140/90 and she has gained another 4 lb. (1.8 kg.) in weight. Now she admits that towards evening her ankles swell. She is not sleeping well and appears to be rather "on edge." She asks if the baby is "lying right" and says, "I hope everything is going to be all right."

On examination the vertex is presenting; the head is engaged in the pelvic brim and the uterus corresponds in size to the expected date of confinement. There is slight oedema of the shins. Her general practitioner, who has known her for years, observes a slight coarsening of the features, common in an initial pregnancy but developing so insidiously that it may easily escape notice, especially by anyone who sees her for the first time. Now the syndrome of toxaemia of pregnancy, always in the background, has become manifest.

Management

What should be done? By all standards the condition is at present mild and it seems a pity to disturb a happy arrangement, which suits the patient and in which she has confidence, because her blood-pressure is slightly elevated and the degree of tissue fluid retention, always present in pregnancy, has reached the level at which slight oedema is detectable.

Stress factors already exist, minor worries about the new home and the extra physical effort involved in its preparation, and there is no doubt that physical rest and a placid emotional state are desirable in the prevention and treatment of toxaemia. Stress may be caused by a prolonged labour, but it is unlikely that this healthy, mature, and well-proportioned young woman will have an abnormal labour. Nor is it likely that labour will have to be induced, for most cases of uncomplicated toxaemia can be treated expectantly up to term. On the other hand, such patients should not be allowed to exceed the expected date of delivery, provided that it has been ascertained by all the means at our disposal, including accurate knowledge of the date of quickening.

G.P. and Consultant

At this stage the general practitioner decides that both he and the patient require reassurance, and invites consultant opinion, emphasizing that domiciliary confinement is preferred. The consultant agrees to see this patient in her home, for although she is fit to attend a hospital clinic, the circumstances of consultation there might make her regard herself as an "abnormal case." Moreover, there is much to be gained by the consultant's seeing for himself that the environment is a satisfactory one. Personal discussion between consultant and general practitioner is more informal and more reassuring to the patient.

The consultant confirms all the findings and agrees that there is as yet no need for concern. The patient is advised to spend most of the day at rest in bed. She is already on a diet of high protein, low carbohydrate, and fat, and she is now advised to omit salt from her cooking and to avoid it at table. Sedation with "amytal" (amyllobarbitone), $\frac{1}{4}$ gr. (32 mg.) thrice a day, and a single course of one of the oral diuretics, such as chlorothiazide, one gramme daily for three days, or acetazolamide, 500 mg. daily for five days, is prescribed. It is agreed that if progress is satisfactory, oedema does not increase, blood-pressure does not exceed 140/90, and

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albuminuria remains absent, the patient may proceed to term, with hope of spontaneous onset of labour and uneventful confinement.

Progress and Delivery

The next week is spent largely at rest: a good diuresis occurs within the first 48 hours, and the blood-pressure settles to around 130/80 with minor fluctuations. At the 39th week the head is deep in the pelvis and vaginal examination reveals a well-prepared cervix, thin and relaxed, the external os admitting one finger. As the expected date of confinement draws near the patient becomes rather more "keyed up" and her blood-pressure rises again to 140/90, though without increase in oedema. Her doctor contemplates hospital admission, but the maternity unit is close by and after a telephone discussion with his consultant colleague they decide to wait another two or three days. Transfer to hospital, even in the early stages of labour, would be very simple, should there be any sudden increase in the toxaemic manifestations. Fortunately spontaneous labour ensues and after a first stage of about 15 hours, during which the blood-pressure rises on one occasion to 160/90, she achieves spontaneous delivery of a 7½ lb. (3.42 kg.) healthy baby, the second stage being accelerated by an episiotomy. The placenta is complete and weighs 1½ lb. (0.68 kg.).

Comment

The case has terminated in a manner satisfactory to all concerned and such a happy outcome may be expected in about half of the patients displaying a minor degree of toxaemia such as described. But this woman might not have been so fortunate. After a week in bed with no change in the blood-pressure a trace of albumin might have occurred, or increasing oedema, or she might have reached term without incident but shown no sign of coming into labour. By this time the patient would be prepared to accept further supervision under hospital conditions and the doctor would be glad to get her off his hands. It is to be hoped that he would continue to take an active share in her further care and in the management of labour in hospital, for the gain to everyone, including the hospital staff, would be immense. This happy co-operation of hospital and district services would be further enhanced if the midwife already engaged for the home confinement could freely enter the hospital and be with her patient during labour even without taking any active part in the conduct of it.

Clinical Features of Toxaemia

Toxaemia of pregnancy should not be regarded as a clear-cut clinical entity affecting only a minority. The incidence of the established condition is probably in the region of 10% of all primigravidae and 5% of all multigravidae, but this simply means the incidence of a condition clinically recognizable as an abnormality and demanding the presence of two of the following three major signs:

1. A blood-pressure of more than 135/85.
2. Oedema. This must not be confused with mere swelling of the ankles, for many women with poor peripheral circulation, moderate anaemia, or obesity show oedema of the ankles after prolonged standing. Toxaemia of pregnancy produces generalized oedema manifest commonly by tightness of the wedding-ring in the first place and by an excessive gain in weight. The best standard to adopt is a gain in weight of more than 5 lb. (2.2 kg.) in any single period of four weeks of pregnancy.
3. Albuminuria. Again caution is required in the definition of this symptom. Although a trace of albumin may appear as a result of urinary infection or vaginal discharge, true albuminuria must always be regarded as a danger sign. Toxaemia should be treated at the first appearance of hypertension and oedema.

There may be certain subjective symptoms such as headache, tingling in the fingers, a recurrence of vomiting in late pregnancy, epigastric pain, disturbance of vision, strangeness of manner or undue drowsiness, but these features are noted only in the more severe cases.

In every pregnant woman the blood-pressure tends to drop slightly during the second trimester and rise during the third trimester, so that by the time term is reached it is even slightly above its level at the beginning of pregnancy. Nearly every pregnant woman gains more weight during the whole of her pregnancy than can be accounted for by the increased weight of the uterus, blood-volume, the foetus and placenta, and so on. There is a gain of several pounds, which might be explicable by the increase in body tissue generally but is usually due to fluid retention. The elements of pregnancy toxaemia are present in every pregnant woman, but in only 5% to 10% does the change in physiology exceed the limits beyond which we term the case one of toxaemia of pregnancy.

Precipitating Factors

Why do some transcend these limits? Of the many explanations advanced none explains all the features of toxaemia. Pre-existing vascular and renal disease predispose towards the more serious forms. The "utero-renal reflex" of Sophian may explain the higher incidence in primigravidae. Stress factors, both physical and emotional, are important; contentment of mind is desirable in pregnancy. Severe hypochromic anaemia, and especially megaloblastic anaemia, are often associated with the signs of toxaemia of pregnancy. Hydramnios is said to play a part, though this is doubtful, but certainly multiple pregnancy and the rare hydatidiform mole produce a high incidence. Finally, postmaturity if genuine is usually accompanied by toxaemic manifestations, and women in whom labour is prolonged will usually display increasing hypertension before final delivery.

Obesity is generally regarded as a precipitating factor, though most of us have known many healthily plump young women who have never shown the slightest sign of toxaemia during their first pregnancies. It must be admitted that we really do not know what the final precipitating factor is, but we must be on the look-out for all the possibilities described above.

Toxaemia in the Multigravida

A history of mild toxaemia in a first pregnancy is relatively unimportant as regards subsequent pregnancies, but the parous woman with the so-called "recurrent toxaemia" presents a very definite problem, involving the risk of placental insufficiency and renal disease or hypertension; she should be treated in a main maternity unit. The parous woman who starts her pregnancy with a normal blood-pressure but later develops mild toxaemia can certainly be dealt with at home; it may be very important that she should not be separated from her other young children. Labour is usually very short, and induction even in the home can usually be achieved with negligible risk. There is the disadvantage that rest is less easy because of the demands of her family. The policy, already in operation in Newcastle, of providing a home help without charge to the patient is to be encouraged. Such a home help must be available freely in all senses. It is difficult enough to persuade a woman with other young children to rest for a condition which to her presents no distressing symptoms, and even more difficult if her husband is being asked to pay extra for that rest.

Conduct of Labour

Labour represents a stress factor. A woman free of any toxaemia manifestations may develop them in the course of labour, and a patient with mild toxaemia may become worse. Regular recording of blood-pressure is essential, at four-hourly intervals in the earlier stages, and half-hourly in the latter part of labour. The urine should be checked for albumin, and any subjective manifestations such as already described are indications of danger. In remote areas from where transfer during

labour would be time-consuming, even the milder cases should be admitted to a main maternity unit before the onset of labour. Otherwise all that is required is the normal conduct of labour with a special look-out for danger signs. Episiotomy, and even forceps delivery to expedite the second stage, should be given earlier consideration than is usual in an entirely straightforward case.

The most likely complication to be encountered is prolongation of labour. Always potentially serious, this becomes more so if toxæmic manifestations are present. After twelve hours of *established* labour a decision must be reached whether it is likely to be completed within the next twelve hours. If not, it is wiser to transfer the patient to a unit where her further progress can be more closely watched. The first stage can then be shortened by caesarean section. This radical step, though rarely necessary, is sometimes essential.

Induction of Labour

With a well-prepared cervix, a relaxed lower segment, the head in the pelvis, and the external os admitting one finger readily, there is no intrinsic reason against induction of labour in the home. It is easy to rupture membranes with a vulsellum, or even with a wool-tipped throat swab. However, once induction of labour is contemplated, one must bear in mind the possibilities, remote though they may be, of failure of induction, of infection of the liquor, and even the ultimate need in the exceptional case of caesarean section because of such events. Therefore induction of labour is usually better carried out within the confines of a fully equipped maternity unit. There is no reason, however, why the general-practitioner obstetrician should not be in personal charge of induction with the facilities offered by such a unit.

Complications and Dangers

The confidential inquiry into maternity deaths in England and Wales in 1958-1960 showed that many mothers either do not realize the need for advice from their doctors, or do not co-operate in carrying it out. This lack of understanding is the commonest defect in our management of toxæmia of pregnancy. Almost as common is the failure of the consultant or general-practitioner obstetrician to recognize the early signs of deterioration. The first essential is to make sure that the patient understands the importance of seeking the help of her general practitioner in the event of any untoward symptoms. Theobald has suggested that every pregnant woman should be examined every week during the whole of her pregnancy. Such a course of action would be ideal but would certainly quadruple our work. Even under present conditions, one of the problems of maternity work in general is that a great deal of time is spent over apparently normal patients. In retrospect it may seem that 90% of the supervision has proved unnecessary, but no maternity case is normal except in retrospect.

This article is intended to cover the management of toxæmia in general practice, and no attempt has been made to discuss the controversial field of chronic pyelonephritis, chronic nephritis, patients with persistent albuminuria of unknown origin, or those with essential hypertension. Such patients should be detected at an early stage in their pregnancy because of albuminuria, initial hypertension, or a previous history of genito-urinary disease or trouble in previous pregnancies and deserve immediate reference to a main maternity unit. The general practitioner obstetrician can play a part in the further supervision of such patients, possibly by alternating his antenatal examinations with those of the hospital service. It is highly desirable that even after admission to hospital the general practitioner should continue to play a part in the management of the case. The differential diagnosis demands considerable laboratory investigations and frequent, sometimes daily, reassessment of progress. It is

sufficient here to draw attention again to the danger signs already detailed and to discuss two further complications which may present as emergencies.

Two Emergencies

Accidental Haemorrhage

The more serious type of accidental haemorrhage with concealed haemorrhage is almost exclusively associated with toxæmia of pregnancy. The picture is fairly clear—acute abdominal pain, a tender uterus, usually larger than the dates would suggest, an absent foetal heart, a shocked patient, and minimal or absent external haemorrhage. Such patients merit resuscitation when encountered in the home and certainly justify the attention of the Flying Squad before transfer to hospital, but the problem of their management is entirely one for the hospital service. The milder varieties of accidental haemorrhage, in which abdominal pain usually precedes the haemorrhage, are by no means clearly associated with toxæmia though there is a slightly increased frequency of the milder accidental haemorrhage in cases of toxæmia. These cases also merit admission to hospital, as do all cases of ante-partum haemorrhage.

Eclampsia

Eclampsia should not arise in a case of pregnancy toxæmia managed in the home but it is necessary to point out that any case of toxæmia, no matter how mild, may suddenly, especially under adverse conditions of cold, fatigue, or upper respiratory infection, become worse and then may present very quickly as a real pre-eclamptic or even an imminent eclampsia. The warning signs are usually, but not always, the appearance of albuminuria, frontal headache, sudden increase in oedema, and epigastric pain, and any of these symptoms demand immediate reference to a main maternity unit or at least a domiciliary consultation. A special warning is justified concerning the development in late pregnancy of symptoms suggesting an acute coryza which may really be due to exacerbation of toxæmia with oedema of the upper respiratory tract.

Fulminating eclampsia, coma and convulsions presenting without warning, is so rare as to raise doubt when it does occur about the diagnosis, but it is possible that the general practitioner might be presented in emergency with a true case of eclampsia and the best advice is to send for the local Flying Squad. It cannot come at once, then the best immediate sedative, though not one to be repeated, is morphine, one-third of a grain. Treatment in the home by the Flying Squad, especially with the administration of "avertin" (bromethol) before transport to hospital, is now regarded as a potential life-saving measure, and rarely indeed should the eclamptic be packed off to hospital without adequate sedation.

Risk to the Baby

In general, toxæmia of pregnancy is the most important single cause of stillbirths and neonatal deaths, also of prematurity whether spontaneous or induced. In the more severe cases, especially those with essential hypertension and chronic renal lesions, the baby is very much at risk, but the risk is minimal in the milder type of toxæmia. Apart from the possibility of accidental haemorrhage, the placenta is rarely affected, provided the toxæmic process does not continue too long, and it remains an efficient organ for the nutrition of the child at least until term. It has already been remarked that pregnancy toxæmia, even of a mild degree, should not be allowed to continue beyond the true date of maturity, but in the type of case described above risk to the child is very slight and would not be decreased by hospital admission.

Provided that the toxaemic manifestations remain within moderate limits, are not continued for more than two or three weeks, that albuminuria remains absent, and the baby appears to be growing normally, the risk to the child is little greater than in a straightforward pregnancy. Nor is there any evidence so far that the progress of babies born after mild toxaemic episodes is any different from others, though in the more severe degrees of toxaemia, associated with placental insufficiency, anoxia may cause permanent cerebral damage.

Conclusion

I have tried to indicate the extent to which toxaemia of pregnancy, the physical changes of which are basically an essential

part of pregnancy and which commonly presents as a comparatively mild condition in late pregnancy, may be dealt with under conditions of domiciliary obstetrics, provided adequate precautions are observed.

The alternative is to regard any patient who displays a rise of blood-pressure above 130/85, or any visible oedema, as an abnormal case demanding hospital delivery. This appears to be playing for safety to an extent which ignores human emotions and the need for contentment of mind on the part of both patient and general practitioner.

In the preparation of this article I have been greatly helped by my two general-practitioner colleagues Dr. G. Roland Freeman and Dr. John Earle with whom I discussed the original draft. Their suggestions have been incorporated in the final article.

TO-DAY'S DRUGS

Chemotherapy of Malaria

Four malaria parasites occur in man. The most common is *Plasmodium vivax*, which causes benign tertian malaria throughout the tropical and subtropical zones, and in parts of the temperate zone where it has a seasonal incidence. *P. falciparum* causes malignant tertian malaria, which is more essentially tropical in its distribution. Both *P. ovale* (ovale tertian malaria) and *P. malariae* (quartan malaria) are more regionally distributed in the tropics and subtropics and are, comparatively speaking, rare parasites. Any of these parasitic infections may be present in returned emigrants from this country or in immigrants from the endemic areas. They do not spread by natural means (mosquito transference) in this country, with the occasional exception of *P. vivax*, which may do so under suitable climatic conditions. Syringe transference of any of them, however, can occur; from time to time, for example, it occurs as a result of blood transfusion. This last hazard can be obviated by treating the donor with chloroquine at least a day before using him.

All these parasites multiply in circulating red cells in an asexual (schizogony) cycle of development; this particular cycle alone is responsible for the pathology and clinical manifestations of malaria. From this cycle also arise the presexual forms (gametocytes) of the parasite, which perish unless taken up by a suitable mosquito host under suitable environmental conditions. But in addition to the erythrocytic schizogony cycle, in the case of all the parasites, with the very notable exception of the malignant tertian (*P. falciparum*), there is an exo-erythrocytic cycle of development in tissue, notably the liver. This exo-erythrocytic cycle causes no trouble to the patient directly, but it is responsible for renewal of the erythrocytic cycle (schizogony) after the latter has died out, possibly as a result of treatment. It may consequently cause relapses, at intervals over a period of a year or two in the case of *P. vivax* and *P. ovale*, and possibly over a great many (up to 30) years in rare cases of *P. malariae* infection. All acute attacks of malaria, whatever the parasite involved, are due to the erythrocytic schizogony cycle; therefore during the period of the attacks (not solely during the actual fever) there are parasites in the peripheral blood. The diagnosis of malaria, and the identity of the causative parasite, is established by finding them there. There is no other means of specific diagnosis of malaria. The history (often misleading) and the clinical picture (possibly suggestive) are inadequate.

Specific Drug Treatment

There is no one drug which is effective against all stages of the malaria parasites. Therefore the treatment of a malaria

infection usually has to be divided into two stages, with the use of drugs appropriate to the purpose of each. The first stage is the control of the acute attack of the disease, whatever the parasite, by destruction of the erythrocytic parasites of the schizogony cycle. The second is the destruction of the residual tissue forms of the exo-erythrocytic cycle, which if left will initiate further erythrocytic cycles, and so clinical relapse of the disease; this will occur in all forms of malaria other than malignant tertian (*P. falciparum*), in which there is no residual tissue, or exo-erythrocytic, cycle. In malignant tertian malaria complete destruction of all erythrocytic (schizogony) forms suffices to sterilize the infection, and so to obviate relapse.

Acute Uncomplicated Attacks

Blood films are first taken to prove the diagnosis. These are examined at once or subsequently as circumstances dictate. Then treatment is given with one or other of the following ("schizonticidal") drugs:

4-Aminoquinolines

Chloroquine in the form of the sulphate ("nivaquine"), diphosphate ("avlocor"), or hydrochloride is put up in tablets, each containing 150 mg. of the base. The salt does not matter; the initial dose by mouth is 600 mg. of the base (four tablets); 300 mg. (two tablets) are given six hours later; and then 300 mg. daily (in divided doses) for another two days.

Headache, pruritus, and blurring of vision are very occasional side-effects of chloroquine treatment; they stop shortly after its cessation.

Amodiaquine ("camoquin") tablets each contain 200 mg. of the base. An initial dose of 600 mg. of the base (three tablets) is followed after six hours by 300 mg., and then by 300 mg. daily for another two days. Side-effects are rare; lassitude, anorexia, and insomnia have resulted from continued substantial daily dosage.

Mepacrine

Mepacrine ("atebrin" or "quinacrine") is a yellow acridine dye put up in tablets, each containing 100 mg. of the base. It was the first of the synthetic antimalarials and was widely used to replace quinine during the second world war. Three doses each of 300 mg. (a total of nine tablets) are given on the first day; and thereafter three of 100 mg. each daily for another six days. It is rather slow in action on the parasites and in bringing clinical relief.