EMERGENCIES IN GENERAL PRACTICE**THE MANAGEMENT OF ECLAMPSIA**

BY

W. I. C. MORRIS, M.B., M.Sc., F.R.C.S.Ed., F.R.C.O.G.*Professor of Obstetrics and Gynaecology, University of Manchester; Obstetrician and Gynaecologist, St. Mary's Hospital, Manchester*

Although eclampsia remains one of the most serious of obstetrical complications, the Australian workers have shown that in the practice of a first-class maternity hospital a determined effort to eliminate eclampsia may be completely successful.* The measures which succeeded at the Crown Street Hospital in Sydney were administrative as well as medical. They involved arrangements for antenatal out-patient care at the very highest standard, and the reallocation of beds so as to increase antenatal accommodation at the expense of lying-in beds. The latter allowed the admission of all patients who showed evidence of pre-eclamptic toxæmia, and also many of those patients who were believed to be likely to develop pre-eclampsia, on the basis of excessive weight gain observed at their frequent antenatal examinations. The most important obstacle to the application of such methods in this country occurs in areas where maternity hospital beds are insufficient to allow an adequate number to be set aside for antenatal patients. In hospitals in more favoured areas eclampsia is already rare, while a general practitioner carrying out alert antenatal care very seldom needs to treat an eclamptic patient at home. Although successful measures for the complete prevention of pre-eclamptic toxæmia have not yet been established, the prompt treatment of early cases of toxæmia is often successful and the immediate transfer to hospital of patients showing severe pre-eclampsia is enough in itself to make convulsive eclampsia a very great rarity in domiciliary practice.

Space does not permit of elaboration of the conservative treatment of pre-eclampsia. So far as general practice is concerned the most successful measure is to increase the time spent by the patient in bed to the maximum compatible with her domestic circumstances. Restriction of sodium intake in the form of cooking salt, table salt, and sodium-containing digestive medicaments is helpful but not always easy. A nocturnal barbiturate—for example, butobarbitone 0.18 g. (3 gr.)—is often advisable. It is most important to keep very clearly in mind the indications that a case of pre-eclampsia is becoming too severe to handle in the patient's home. Of these the most important are (a) oedema which persists in the lower limbs after a complete night's rest, or oedema which significantly affects the hands or face; (b) a blood pressure at or above the level of 150/100; (c) albuminuria confirmed in a catheter specimen of urine, no matter how small the quantity of albumin may be; and (d) finally the well-known prodromal symptoms of eclampsia itself, splitting headache, blurring of vision, severe epigastric pain, and reduction in output of urine.

General Principles of Management

The general practitioner will wish to undertake domiciliary treatment of eclampsia only in most isolated communities, the number of which has been greatly reduced by the availability of good ambulance services. According to Frew the

eclamptic patient appears to travel well by air if under the action of a basal narcotic such as bromethol.

There is as yet no specific treatment for eclampsia. It is universally accepted that measures to limit the number of the fits offer the best hope of saving life. Along with these measures attention is required to the prevention or prompt treatment of such complications of eclampsia as inhalational pneumonia, cardiac embarrassment, or suppression of urine.

The sedative regime associated with the name of Stroganoff has been widely employed with varying success. Morphine and chloral were the drugs originally recommended, but other and more powerful narcotics have been introduced without modifying the essential principles. Of these later drugs the most valuable appear to be sodium thiopentone and bromethol. All are potential respiratory depressants, and the balance between the effective and the toxic dose is very delicately poised.

Certain drugs which reduce the elevated blood pressure are also effective in preventing convulsions. Of these, the extract of *veratrum viride* (a plant of the lily family) manufactured under the proprietary name of "veratrone" has always been popular in the Cincinnati school. In this country Stern and Burnett have authoritatively recommended it.†

Whichever type of drug is selected, the general nursing management of the patient is of the greatest importance. The maintenance of a clear airway is essential. Artificial dentures should be removed as soon as possible. The mouth must be kept clear of secretion, blood, or vomitus. The use of the semiprone position, changing from one side to the other at two-hourly intervals, is probably sound, but care must be taken to swab out the dependent cheek before moving the patient. Quiet, the avoidance of bright light, and the maintenance of an even temperature help to diminish the afferent stimuli which may precipitate convulsions. The eclamptic patient should not be overheated, and there is no reason to encourage sweating by the application of a harsh blanket. The vigorous perspiration often seen during recovery from eclampsia is the result of that recovery, and not its cause.

The possibility of inhalational pneumonia is diminished by good nursing. It is important to give neither solids nor liquids by mouth during the acute phase in order to prevent their inhalation during feeding or regurgitation. Penicillin may be given prophylactically in dosage of 300,000 units eight-hourly.

The heart is most effectively supported by ensuring that anoxia is reduced by keeping the airway completely unobstructed in the intervals between fits. If available, oxygen should be administered immediately after each convulsion and continued so long as there is the slightest trace of cyanosis. Digoxin 1.5 mg. (1/40 gr.) may be given intravenously to a patient who has not been receiving any other form of digitalis. Venesection of 500 ml. may be useful in acute pulmonary oedema, which occasionally complicates cardiac failure in eclampsia.

Obstetrical intervention is generally restricted to the terminal second stage. There is no doubt that the patient who has an eclamptic convulsion when the head is on the perineum is often treated most effectively by an immediate forceps delivery. In other circumstances the better interests

*Hamlin, R. H. T., *Lancet*, 1952, 1, 64.

†*J. Obstet. Gynaec. Brit. Emp.*, 1954, 61, 590.

of the patient are usually served by conservatism. In hospital practice there is a place for induction of labour in ante-partum eclampsia, but usually such intervention is delayed until the fits are controlled by sedatives, by which time labour has often ensued spontaneously. Caesarean section is not to be regarded as a treatment of choice in any circumstances. It is inevitably associated with a high maternal mortality in eclampsia. There are occasional cases, however, where it may seem justified to a person with very great experience of the treatment of eclampsia.

Observation of the eclamptic patient must be close and uninterrupted. Changes in skin colour, the depth of coma or degree of restlessness, the temperature, pulse and respiration, the variations in blood pressure, the volume of urinary secretion, the activity of the uterus, all require watching. Too much disturbance of the patient is to be avoided, but a four-hourly report from the midwife is a great support in controlling treatment. There is little point in being scrupulous about the foetal heart sounds during the acute phase of the disease, for the foetus is always in grave danger in eclampsia and the detection of signs of foetal distress is unlikely to influence treatment greatly. Despite the old adage, intrauterine death of the foetus does not have much influence on the maternal prognosis.

First Aid

The fit of eclampsia is essentially similar to that of epilepsy except that there is no phenomenon strictly comparable to the aura of epilepsy. After slight facial twitching a tonic phase sets in, being followed by the onset of clonic spasms. The end of the fit is usually preceded by the coincidence of a clonic inspiratory effort with relaxation of the muscles controlling the glottis. Cyanosis at once diminishes. A moment or two later the jaw muscles relax completely and the fit may be said to have passed off. Coma of variable length and depth follows. In comparison with post-epileptic coma it is relatively brief.

The primary concern of first aid is the prevention of injury during the clonic phase. Gentle restraint for the writhing body will prevent the patient rolling out of bed or knocking her limbs against walls or furniture. Little more than this is possible. The advice to force a gag, a wedge of wood, or the handle of a spoon between the teeth is sound enough in theory, but usually the clenching of the jaws is much too firm to allow this to be done without the risk of loosening teeth or causing other damage. It is some comfort to recollect that if the tongue lies between the teeth at the moment of onset of the fit, nothing can save it, while if it is internal to the opposed jaws it is in any case safe. The time for insertion of a gag or dental prop is immediately after the fit, opportunity being taken to remove any artificial dentures and to swab out the mouth and pharynx if the tongue has been bitten or if there has been any regurgitation of gastric content.

The intravenous administration of sodium thiopentone in dosage of 0.25 to 0.5 g. is very sound as a first-aid procedure. It may be expected to arrest the fit at any stage, and by its prompt administration some lives may be saved which would otherwise be lost during a single unusually severe eclamptic convulsion. Unfortunately the preparation of the injection takes a little time, so that a first convulsion may have come and gone before it can be administered. If this is the case it is prudent to put down the syringe containing the injection in some safe but accessible position, so that it will be instantly available if there be a further attack.

At one time it was customary to endeavour to control the fits by the exhibition of prodigious quantities of chloroform. There is little doubt that the liver damage of eclampsia was often fatally aggravated by this additional insult. Inhalational anaesthetics are useless during the respiratory arrest of the convulsion. Their employment immediately after the convulsion is justifiable as a first-aid measure to delay the onset of further attacks where fits are following each other in very

rapid succession and thiopentone is for any reason unavailable. Chloroform on a Schimmelbusch mask at the rate of approximately 15 drops per minute for not more than 2-3 minutes may allow time for less damaging sedatives to take effect. Ether, theoretically preferable, is too apt to produce salivation, an added embarrassment to breathing.

The immediate management of the eclamptic patient includes certain examinations. It is most useful to obtain some idea (a) whether the patient is in labour or likely soon to be in labour, (b) whether there is any abnormality likely to give rise to mechanical difficulty, and (c) whether her urinary output is satisfactory. As the necessary examinations may well precipitate a convulsion in a restless semi-conscious patient, it is well to take the opportunity to carry them out in the period of coma immediately following a seizure, especially if thiopentone or chloroform has been given. The unconsciousness is then likely to be prolonged by a few additional minutes which will allow a quick abdominal and vaginal examination and the passage of a catheter. If a self-retaining catheter is available, its use should certainly be considered. A clip can be applied to it when the bladder has been emptied, and thereafter the release of the clip at four-hourly intervals enables the urinary output to be exactly measured without further disturbance of the patient.

Further Management

When "Flying-Squad" Service Available

If such a service operates in the practitioner's area and is willing to undertake treatment of the eclamptic prior to and during her movement to hospital, then the hospital should be contacted without delay. A joint scheme of treatment can be worked out in accordance with local policy.

No Flying-Squad Available but Removal to Hospital Possible

In city practice it is enough to move the patient as quickly as possible by ambulance from her home to the hospital of choice. The practitioner should accompany his patient. It is useful to take a gag and tongue forceps, a Schimmelbusch mask, and a bottle of chloroform. Where distances are greater it is wiser to begin sedative treatment in the home and to delay moving the patient until such sedatives have had time to take effect. A very useful drug for this purpose is bromethol, of which 5.5 ml. dissolved in 220 ml. of tap-water at body temperature may be administered rectally. This acts within 20 minutes and the deep narcosis which follows renders the transport of the patient fairly safe. Unfortunately, the use of bromethol in general practice is limited by the fact that it is now rarely obtainable outside maternity hospitals, its vogue as a basal anaesthetic in general surgery having expired. It is an excellent "flying-squad" medicament, but the unaided general practitioner will often need to adopt other expedients. Of these morphine with all its faults as a respiratory depressant is the most useful and generally available. Its reinforcement with some other sedative (e.g., chloral or a barbiturate) is usually practised, since it may then be possible to avoid very full doses of morphine. The following scheme of dosage is advised, the hour of commencing treatment being represented by the symbol "H." All drugs are administered intramuscularly.

Hour	Drug	Dose
H	{ Morphine	.. 15 mg. (½ gr.)
	{ Sodium phenobarbitone ..	.. 0.3 g. (5 gr.)
H+1	.. Morphine	.. 10 mg. (1/6 gr.)
H+2	.. Depart by ambulance	

The second dose of morphine should be omitted in the unlikely event of any real respiratory depression (e.g., respirations 10 per minute or less), but if so an appropriately loaded syringe should be entrusted to the ambulance nurse to use if the patient has a further seizure during transit. It must be emphasized that the delay in moving the patient is justified only if the first injection produces some degree of control of her fits. If she continues to have fits some thirty minutes after starting treatment, no time should be lost in giving the second injection of morphine and dispatching her to hospital.

Removal to Hospital Impossible

Faced with the need to treat his patient entirely at home, the single-handed practitioner cannot hope to apply treatments which may tax the resources of a fully-staffed maternity hospital. Methods involving prolonged medical supervision can hardly be selected, and it is not practical to consider such treatments as the continuous intravenous thiopentone management of O'Donel Browne. The drugs readily available to the practitioner are likely to be limited to those of sedative type, and accordingly a Stroganoff type of management is likely to be forced on him. The aim should be to keep the patient deeply narcotized for at least 24 hours, and thereafter to prolong the sedation in lesser degree for a further 24 hours. Most patients are out of danger by that time. The following dosage scheme is suggested, the hour of commencing treatment being represented by the symbol "H"; all drugs are administered intramuscularly.

Hour	Drug	Dose
H	{ Morphine	.. 15 mg. ($\frac{1}{4}$ gr.)
	{ Sodium phenobarbitone ..	.. 0.3 g. (5 gr.)
H+1	.. Morphine	.. 10 mg. ($\frac{1}{6}$ gr.)
H+4	.. Morphine	.. 15 mg. ($\frac{1}{4}$ gr.)
H+8	.. Morphine	.. 15 mg. ($\frac{1}{4}$ gr.)
H+12	.. Sodium phenobarbitone ..	.. 0.3 g. (5 gr.)
H+18	.. Morphine	.. 15 mg. ($\frac{1}{4}$ gr.)
H+24	.. Sodium phenobarbitone ..	.. 0.3 g. (5 gr.)
H+30	.. Morphine	.. 15 mg. ($\frac{1}{4}$ gr.)
H+36	.. Sodium phenobarbitone ..	.. 0.3 g. (5 gr.)

The recurrence of fits despite treatment might well justify the acceleration or increase of the doses of morphine. Indications to delay the next dose include undue respiratory depression (respirations 10 or fewer per minute), persistent cyanosis, and accumulation of bubbling secretion in the trachea and bronchi—usually an indication for full dosage of atropine (i.e., 1 mg.—1/60 gr.).

In addition to sedatives, some value is attached to the parenteral injection of hypertonic solutions of glucose or magnesium sulphate. These may have some effect in reducing cerebral oedema. Glucose is believed also to favour diuresis, while magnesium sulphate may reduce blood pressure slightly and appears to potentiate the anticonvulsant action of morphine. Glucose is given intravenously in daily dosage of 1,000 ml. of 20% aqueous solution. Magnesium sulphate is usually given intramuscularly in 50% aqueous solution, in dosage of 10 ml. repeated after each convulsion up to a total daily dose of 60 ml. The side-effect of paralysis of voluntary muscle must be kept in mind, and a total dose of 20 ml. should not be exceeded without making sure that the knee-jerks are present at the time each fresh injection is given.

Other useful drugs are: (a) *Sedatives*: Chloral hydrate, oral or rectal, 3 g. (45 gr.)—4 g. (60 gr.); paraldehyde, rectal, 40 ml. (1 fl. oz.), intramuscularly, 10–20 ml. (2–4 fl. dr.). (b) *Veratrine*, intramuscularly, 0.6 ml. (10 minims)—as initial dose. Further doses, if necessary, may be started after 30 minutes. They must be controlled by blood-pressure readings at 15-minute intervals. The aim is to secure an early reduction of systolic blood pressure to less than 120. Thereafter veratrine is withheld unless the systolic pressure rises above 150 mm. Hg. For details see Stern and Burnett's paper mentioned earlier in this article.

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**INTERNATIONAL FEDERATION OF
GYNAECOLOGY AND OBSTETRICS**

The constitution of the International Federation of Gynaecology and Obstetrics has now been adopted by 42 countries, including Great Britain, Canada, Eire, India, New Zealand, the United States, and Russia. The Federation was founded during the International Congress on Obstetrics and Gynaecology in Geneva last year, and has the following objects:

(a) To promote the development of science and assist in scientific research work relating to all the fields pertaining to gynaecology and obstetrics, to further the attainment, by all appropriate means, of a higher level of physical and mental health of women, mothers and their children, to develop and improve the exchange of information and ideas in the field of gynaecology and obstetrics, to contribute to the research of fresh knowledge in this field, to contribute to the improvement of teaching standards in the profession, to promote international co-operation and facilitate relationships between national medical bodies of the profession.

(b) To recommend a common policy in regard to these matters on the proposal of member societies.

(c) To represent member societies whenever joint scientific action can be pursued in such matters.

(d) To foster the initiation and development of all activities aiming at the attainment of the objects of the Federation as defined under (a) above.

(e) To organize international congresses, including all countries or certain groups of countries. Circumstances permitting, each international congress shall be held successively on a different continent. Members of national societies may attend all congresses.

The executive board of the Federation is composed as follows: *president*, Professor H. de Watteville (Switzerland); *vice-presidents*, Professor L. Gérin-Lajoie (Canada) and Professor E. Cova (Italy); *secretary*, Professor R. Keller (France); *treasurer*, Dr. F. L. Adair (U.S.A.); *members*, Professor César A. Brea (Argentina), Professor O. Rodrigues Lima (Brazil), Professor H. Martius (Germany), Dr. V. B. Green-Armytage (Great Britain), Professor B. N. Purandare (India), Professor Hideo Yagi (Japan), Professor A. Bravo (Mexico), Dr. J. Harbutt (New Zealand), Dr. Howard C. Taylor, jun. (U.S.A.), and Professor A. Belochapko (U.S.S.R.); *executive secretary*, Dr. W. Geisendorf (Switzerland).

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