A British Medical Association Lecture

ON

SEDATIVES IN LABOUR, PARTICULARLY
"TWILIGHT SLEEP."

DELIVERED BEFORE THE LEICESTER AND RUTLAND DIVISION

BY

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SOME preliminary observations are necessary to emphasize the important part played by sedatives in modern obstetric practice by removing influences inhibiting uterine action.

The chief characteristic of present-day midwifery as compared with that of a generation ago is its permeation with the ideals of preventive medicine, with the preservation of normal function in all systems of the body, as its primary aim. In midwifery our aim must likewise be to secure the normal throughout the processes of reproduction, in pregnancy, labour, lying-in, and lactation, and all interference with or substitution for normal function must be regarded as a failure to attain that end. In accordance with this principle success in obstetric practice will be measured by the proportion of natural pregnancies and labours obtained without disability in mother or child.

Suppose that by careful ante-natal supervision the various discoverable causes of disordered function in labour have, so far as possible, been eliminated—the misfits, malpresentations, malpositions, and such-like—and the physically well-developed and healthy woman, in whom no abnormality, general or obstetric, is found, is alone under consideration, can we be certain that she will have a normal labour and deliver herself without artificial aid? We cannot, and why? Because there may be some failure of the natural powers—particularly of the final expulsive powers—usually the failure to overcome the last obstacle to the birth, the resistance of the muscular pillars at the outlet. Hence the frequency of the low forceps operation, particularly in young and healthy primiparae, in whom fatigue is readily produced by the longer labour. The failure here is generally ascribed to the resistance of the soft parts—a factor undoubtedly—but, with the uterus working strongly and good expulsive efforts, the soft parts would give; in other words, relative weakness of the expulsive powers occurs. No hard-working, self-respecting uterus will be checked for long by soft parts. The failure of function is the non-development of the strong final contractions that are normally excited by the distension of the vagina and outlet.

The possible causes of even these minor failures to complete natural parturition and how they may be removed or circumvented must be thought out by all who approach midwifery in the proper attitude of mind. Those who continue without further thought to fall back on a substitute for the natural powers are living in the mechanical era (of which more anon) and are not imbued with modern ideas. Commonly the reasons are fatigue and weariness of the patient together with the inhibiting effects on uterine action of mental states, such as fear and anxiety, and the elimination of these inhibiting influences by sedatives is an important part of the management of labour.

FREQUENCY OF ARTIFICIAL AID.

Why has assistance in labour become so common that it has been stated that parturition is "pathologic" rather than "physiologic" in the women of to-day? Artificial delivery is more frequent among the more educated and leisured classes. The woman inured to hardship delivers herself easily and is up and about in a short time, for she can submit to conditions impossible to her more imaginative and sensitive sisters. Why are the women, especially of the more leisured classes, to-day less capable of reproducing their species than their great-grandmothers, in whose days forceps delivery occurred in but a fraction of the cases in which it is now practised?

The attitude of the medical profession has undoubtedly played an important part, for medicine as a whole, and

obstetrics with it, has passed through a phase in which substitutes for nature have been developed and perfected—for example, the strong biceps of the accoucheur instead of the uterine muscle, artificial feeding instead of breast-feeding, and the excessive resort to Caesarean section. Also the relief of pain is expected from childhood onwards, for the extraction of a tooth or other minor surgical procedure, and women to-day feel the right to expect from their doctors the relief in labour that chloroform and the forceps can give. Many practitioners, indeed, advocate what they term the "humanitarian" indication for forceps delivery, and it is on that ground that the one who acknowledged to a forceps rate of 100 per cent., "if I am there in time," could be justified. Certainly the rate is five or six times greater in family than in hospital practice. There has thus come about a change in the mental attitude of the women themselves; they are not prepared to do without the artificial relief that the doctor can give, and have not confidence enough in their unaided efforts, and, in the conditions in which family practice is conducted, the pressure on the doctor to give his aid is often too strong to be resisted.

MAINTENANCE OF NATURAL FUNCTION.

Although the securing of natural function in parturition is a more difficult problem than it was, our object must be to find an answer to the question, How can we circumvent the social and psychical changes that have come with advances in medicine and with the changed attitude of mind in which the reproductive function is approached by the women of to-day?

The problem may be stated in terms of the physiology of labour. There are certain factors that augment uterine action—for example, the reflex effects of the dilatation of the cervix, the distension of the vagina, and the stretching of the perineum by the foetal head; and certain inhibitory factors—distension of bladder and bowel, fatigue and emotional states, together with the loss of the augmenting effects by the diminished reflex response that comes with anaesthesia and other means of lessening sensitiveness to pain. The question thus resolves itself into considering how far the good results of anaesthesia, analgesia, and sedatives generally can be obtained with the least loss of augmentor reflex response. Further, it must be our object to lessen pain and distress and avoid the more protracted recovery that may follow any severe nervous strain.

Recognizing that the factors mentioned are largely psychical, something can be done by educating the pregnant woman, and encouraging her to regard herself as better able to perform a natural function than her granddam, and as well able as the hardier woman of the working classes; also by explaining what she has to do herself and when she can get relief. Every one of us must acknowledge the value of the first-class midwife in keeping up her patient's confidence and encouraging her to make the most of her own powers. Something can be done in ante-natal and intra-natal management in this direction.

SEDATIVES.

To come to our subject, the use of sedatives. You all use them to some extent, and it does not matter in what form, but my own preference is for morphine, occasionally combined with a sleeping draught, such as a bromide and chloral mixture. A sedative may be indicated early in labour when the onset of the true rhythmic pains is delayed, and the woman is worried and fatigued by short, sharp pains that appear to do no good, or by a period, perhaps a day or more, of "niggling" pains, before the long, steady, and useful contractions are established. Also when the patient is tiring any time before the os is fully dilated and the head low in the pelvis. If she is left alone she may lose self-control, weep and throw herself about, and later become played out, and her uterus will not function properly. A hypodermic injection of morphine should be given when she is tiring, and before she is tired; the rest and comparative relief will enable her to regain her self-control, and uterine action will return with fresh strength after a period of rest. The relief to the patient also brings relief from the insistent pressure of distracted relatives that is so trying in domiciliary midwifery.

Punch, always a keen critic of the frailties of the day, hit it off in that delightful picture of the doctor assuring the prospective and overwrought father that in all his midwifery experience he had not yet lost a father.

Another indication for the use of a sedative is what is called rigidity of the os. Commonly it is spasmodic, organic rigidity being very rare, and is most often met with in nervous, highly strung, but perfectly healthy primiparae. This rigidity is not to be considered as a specific condition of the cervix, for it is merely the expression of poor or erratic uterine action; with good contractions there will be good dilatation, with poor contractions poor dilatation. Rigidity frequently accompanies the cases already described in which the pains are short and sharp and without rhythm, sometimes termed "colicky" action. The rigid os is to be regarded as a sign of disordered uterine action, and of the kind that yields to an opiate or other sedative.

Whenever there are signs of commencing fatigue, loss of control, and irregular uterine action, a liberal dose of some sedative should be given and repeated if need be. Practically all our emergency cases of delayed labour sent into hospital for immediate delivery—in many of which premature efforts at instrumental delivery have been made—are given morphine (1/4 or 1/3 grain), and it is surprising how many of those without gross mechanical difficulties will deliver themselves after four or five hours' sleep—and sometimes catch us out by performing an unlooked-for "B.B.A." My experience of this type of case in hospital and of cases seen outside that take on a fresh aspect after a few hours' sleep has made me feel that enough use is not made of a sedative sufficient to secure for the patient a rest before resort is made to artificial delivery. If the head is near the outlet it is too late to secure rest, and simpler to try first an injection of pituitrin as a stimulant to uterine action, and if not successful in a quarter of an hour to deliver by the forceps. Also, morphine at this stage is liable to result in the foetus being born narcotized.

TWILIGHT SLEEP.

The morphine-hyoscine narcosis, or "twilight sleep" (Gauss), must be regarded neither as an anaesthetic nor an analgesic, for its aim is the production of amnesia of the events throughout labour. Its success is complete if the mother awakes from sleep or drowsiness following her delivery without any recollection of what she has been through, and if neither she nor her infant shows any ill effect from the narcosis. Dulling of pain to some degree is usually obtained, but the real objective is to abolish the memory of the recurrent pains, and thereby their psychical effects. The patient may groan during uterine contractions, wake up and perhaps raise her head and shoulders from the bed, exhibit the facial expressions of pain, and even complain bitterly and emphatically, but will sink back into a recumbent position and drowsy state when the contraction passes off, and no mental impression that can be recalled will remain. The successful induction of amnesic narcosis removes almost entirely the inhibitions of uterine action of emotional and psychical origin, greatly lessens fatigue, and increases the chances of rapid recovery without the nervous exhaustion that may follow a painful and trying experience in a sensitive subject.

It may be said that labour in such circumstances is not physiological, and it is true to the extent that drugging of a patient in this way diminishes the reflex response to those stimuli augmenting the strength of the contractions; but, on the other hand, it represents the attempt to remove those factors interfering with good expulsive power that the circumstances of our modern social life have brought about. Its use will be justified if the cases in which the narcosis is adopted are limited to those in which the avoidance of fatigue and the exclusion of inhibitory factors will give greater benefit than the disadvantages of lessening reflex response.

Method.

It is best to begin as soon as rhythmical labour pains are definitely established and cause distress. Some would have a degree of dilatation of the os to a size admitting one or two fingers, but examinations for the purpose of determining the amount of dilatation are not advisable. As will be explained later, it is, however, nearly always possible

to begin induction after labour has been in progress some time by starting with light chloroform anaesthesia.

It is very important that the usual preliminaries preparatory to labour, particularly a thorough emptying of the bowels, should be got over before induction of the narcosis is begun, in order to lessen disturbance of the patient. Isolation and quietude for the patient are essential, to exclude so far as possible all external stimuli. She should be shaded from the light, her ears plugged with wool, and disturbed as little as close watching of her condition and the necessary attentions will allow.

The dosage is best described by taking a standard one and suggesting modification in one or other direction in certain conditions. The usual initial dose is 1/4 grain of morphine with 1/150 grain of hyoscine, followed at hourly intervals by 1/450 grain of hyoscine. The morphine is rarely increased beyond 1/4 grain, and is repeated only in special circumstances and in smaller quantity, but the hyoscine may be increased to 1/100 grain for the initial dose, or more often to 1/300 grain for the second dose if the response to the usual initial dose is insufficient. The general rules for determining the best dosage in the individual case may be stated thus. The standard dose should be increased in first labours and for big women of strong physique, and for imaginative, oversensitive, and nervous patients. Morphine 1/6 grain and hyoscine 1/450 grain will suffice for multiparae, for women of a small or frail build, and for those of an easy-going unimaginative type. If begun early in labour, and the patient is a big, strong primigravida intolerant of pain, the first dose should be morphine 1/4 grain and hyoscine 1/100 grain, the frequency of the injections and dosage of hyoscine afterwards being determined by the effect obtained. Idiosyncrasy to hyoscine must be watched for, and the subsequent injections lessened if need be.

The standard time for the subsequent injections of hyoscine is, roughly, at hourly intervals, but in practice the frequency is determined by the effect produced, the memory test being adopted as an index of the amnesic state. The time of the second injection may be anticipated if the response to the first is feeble, but, generally speaking, it is better to keep to the 1/450 grain at shortened intervals rather than increase the amount to 1/300 grain, unless very little effect has been obtained from the first dose.

The memory test is carried out by taking some fairly common object that will not greatly tax the patient's muddled intelligence to recognize, showing it to her, and asking what it is. An hour or so later she may be roused, and asked what she was shown. If she has no recollection of it, the object is produced and the question repeated. If the object presented to her brings back no glimmer of its previous presentation, amnesia is complete. The test is not reliable; often women are able, by an effort at the time, to remember objects previously shown, but are found to have lost all memory of the events in the labour after it is over. Also repeated rousing for this purpose is an interruption to the narcotic state. The test should not be begun till after the second or third injection, and, so far as possible, should be carried out when the patient is disturbed for some other reason—for example, for a drink, a hypodermic injection, to pass water, or have a catheter passed. Also, if any attention of this kind of a sufficiently distinctive character is repeated, the opportunity can be taken to see if the memory of the previous occasion remains.

With further experience the need for repeating the hyoscine injections can be largely determined by noticing whether the patient is fully under the influence of the drug and by watching for signs of overdosage. When fully narcotized she should be drowsy, dosing between pains, but wakened up by them, and relapsing at once into drowsiness again. Should she show no evidence of disturbance during the pains no further injections should be given until some effect becomes noticeable. Usually, after the second or third injection, an interval of two or more hours may be allowed before the next one, provided quietness and drowsiness continue.

Flushing of the face and dilatation of the pupils are, usually present early and are not necessarily indications of overdosage. The pulse and respiration rate should be

carefully observed, as any marked alteration either in the direction of slowing or quickening is an indication for ceasing administration for a time. With overdosage the pulse rate is increased and the respiration rate slowed, and therefore a watch should be kept on any disturbance of the ratio between the two. Usually there is at first some slowing of the pulse rate, probably from the previous excitement and subsequent quietude. When once the pulse rate has settled down, however, it should not alter greatly.

Unfortunately patients are very variable in their response to hyoscine; most of them conform to the type described—sleepy or drowsy between pains but roused by them. Some, however, may remain awake and yet be found afterwards to have complete amnesia, and others may become restless and troublesome. There is always considerable mental confusion, but unless it is associated with excitement and difficulty in controlling the patient, it is not an indication for interfering with the injections. Some degree of restlessness is usual in the early stage, before the complete effect of the drugs is obtained, but in occasional instances it may become very troublesome. It is an indication of overdosage with hyoscine, and may require further administration to be discontinued. A watch must be kept on the bladder, and if the patient is unable to empty it voluntarily the catheter must be passed. Thirst is always well marked and leads to frequent drinks being given. Food, usually liquid, must be given in all lengthy cases.

It will be clear from this general account of its administration that the amnesic narcosis calls for the continuous observation of the patient by a skilled nurse and constant attention by the practitioner in charge. The patient may appear quiet and yet wake up suddenly and, in her mental confusion, get up and wander about and do strange things—for example, hide herself or try to escape. No bowls of poisonous lotion should be left within easy reach, for thirst may drive her to sample the first fluid that comes to hand. Also, to get good results calls for experience in the method.

There are sundry modifications that make its partial use easier to those with little experience of it. Its effects are most valuable in the first stage of labour. In the second stage when the stronger expulsive pains and the distension of the outlet are likely to rouse the patient, resulting in her reconstructing the whole labour and making the induction a failure, it is often easier to fall back on a light general anaesthesia, especially once the outlet begins to gape and birth is imminent. If that is done, it may not be "twilight sleep," but amnesia is secured. Also, if the injections have been discontinued or the patient is out of control, chloroform anaesthesia may be induced—just sufficient to allow of a full examination being made—and if the os is not fully dilated or the head not deep in the pelvic cavity, another injection of morphine—a small dose, say 1/8 grain—may be given which will take effect before the general anaesthesia is recovered from.

The great objection to the routine adoption of this form of narcosis in labour is, to my mind, its undoubted effect in lessening the expulsive contractions of the uterus and voluntary bearing-down efforts, and thereby increasing the number of low forceps operations. The effect on the child—which appears to be almost entirely due to morphine—is of minor moment, as, though born apnoeic and disinclined to breathe, if left alone respiration will be established in a short time. The injection of pituitrin 1/2 c.cm. (that is, up to 5 units) will reduce the number of forceps deliveries, but leave them still above the average, as we found when the method was tried out in a series of cases not specially selected as suitable. The effects on the third stage are not noticeable. Hence my view is that both a careful selection of cases should be made and strict adherence to Gauss's method left to those with long experience of it.

Selection of Cases.

It is valuable for all patients in whom a long and tedious labour may be anticipated, particularly cases of slight disproportion between the head and pelvis, when a long time for moulding is essential. Many of these cases would be of the kind designated as "trial" labours, and

in them it is undoubtedly of great service in lessening fatigue; as soon as the head is well down further administration of hyoscine may be stopped and, if the patient delivers herself, a little chloroform given during the birth of the head. If delivery by forceps is required, anaesthesia is necessary. It is also useful in cardiac cases that have been under ante-natal treatment for decompensation, by lessening fatigue and strain during labour.

Apart from cases in which there is a cause or clear reason for avoiding fatigue, this method is adopted occasionally for cases in which the temperament or excitable state of the patient, especially if associated with a slow and erratic onset of labour, suggests it. It is often asked for by women who have either had a trying experience in a previous labour or have a great dread of what is before them and are without confidence in their unaided powers of going through it. It is always advisable in a medical school to select cases of this type now and then for instructional purposes, so as to keep nurses and students acquainted with the method.

SUMMARY.

Fatigue is of the mind as well as of the body, and is hastened and aggravated by continued pain without relief, by fear, and by loss of self-control, and is a potent factor in the production of inertia and other disorders of uterine function.

With experience on the part of doctors and nurses, success in obtaining amnesia will be attained in nearly three-quarters of the cases, and some relief in the remainder. A great saving of nervous strain is undoubtedly effected by this form of narcosis, but if carried through to the end it has the fatal objection of increasing intervention in labour. For that reason, save in a few special cases, such as I have indicated, I prefer to use morphine, with or without a sleeping draught, or the single initial injection of morphine and hyoscine as and when it seems to be required.

It will be clear that much patient study and observation is required before a solution is reached of the problem of how the relief of the pains of labour and the avoidance of fatigue and nervous strain can be secured without interfering with normal function. Much more must be done in exploring the causes of failure to complete a natural function among physically well-formed women, and so long as the artificial substitute of the forceps is acquiesced in, so long will obstetric practice fail to become saturated with the principles of preventive medicine.

EPIDEMIOLOGICAL OBSERVATIONS ON HOOKWORM INFECTION.

DISCUSSION OF THE QUESTION OF IMMUNITY AND SPECIFIC REACTIONS OF THE HOST IN HELMINTHIC INFECTION.*

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At the invitation of the Government of the Argentine, two years ago, I had, together with Dr. Roberto Dios and Juan Zuccarini, the opportunity of studying the hookworm question in the northern departments of the province of Corrientes, immediately adjacent to Paraguay. The Argentine is in general practically free from endemic hookworm infection, although the frontiers between it and Paraguay are heavily infested with the worms, especially *Necator americanus*. According to Soper (1925) *Necator* seems to have been introduced from the north by African negroes; Paraguay was infested with the same parasite apparently only fifty to sixty years ago by Brazilian negro soldiers. *Ancylostoma duodenale* has apparently a much longer history in South and Central America, and either was brought over by the Spaniards or, as suggested by Soper (1927), is indigenous to the Indian race. In Paraguay and North Corrientes, however, only 5 to 6 per cent. of the expelled human hookworms belong to this species.

* Being a lecture delivered, under the auspices of the University of London, at the London School of Hygiene and Tropical Medicine on March 12th, 1929.