HYOSCINE AMNESIA IN LABOUR

AN ANALYSIS OF FIFTY CASES

BY

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The use of hyoscine during labour was first brought to my notice in a paper by Jennings (*British Medical Journal*, November 2nd, 1929), in which a series of twenty-four cases was reviewed. The method is attributed by him to Dr. Bertha Van Hoosen of Lyola University, U.S.A., who, working on the suggestion that morphine used in the usual twilight sleep technique was responsible for the oligopnoea and asphyxia of some of the newborn, developed a technique in which hyoscine alone is used for the production of amnesia.

The drug used is hyoscine hydrobromide, and it is given by hypodermic injection. The Burroughs Wellcome tablets of 1/100 grain have been used.

NUMBER OF INJECTIONS AND DOSAGE

At the commencement of treatment three injections of hyoscine 1/100 grain are given at half-hourly intervals, and a further dose of 1/100 grain is given two hours later, and repeated every two hours until the termination of the second stage. In many cases the initial three doses are sufficient, and they are given without regard to the age or weight of the patient. The effect of the first injection is slight, and the actual injection is always remembered by the patient. After the second injection, in some few susceptible patients, semi-coma develops, the woman sleeping deeply between the pains, and only stirring slightly during contractions. In such cases the third injection is omitted. The vast majority still complain after the second injection, and a third is then given. In this series of fifty cases no patient received less than three injections. After the third injection amnesia is well developed in most cases. Many patients remember being given the second injection, but they are all oblivious of the third. When fully under the influence of hyoscine the patient sleeps quietly in the intervals between the pains. During the contractions she wakes up, moves the legs and arms, sometimes talks incoherently, but does not cry out. At any time she can be roused sufficiently to open her eyes, but cannot answer simple questions. If she can carry on a conversation, or if she cries out with the pain, a further injection is required.

The state of obtuseness begins to wear off about two hours after the last of the three injections. At this time the patient will begin to complain of the pains; she will cry out and will be able to answer questions put to her. The fourth injection is then necessary. In most cases delivery has been effected before a further lapse of two hours, but if this is not the case a further injection may be given if the signs of returning awareness appear. In this particular series a fourth injection was given in eighteen cases. In no case in this series was a fifth one necessary, although in cases not here included I have given up to seven injections.

WHEN TO COMMENCE TREATMENT

It is essential that uterine contractions should be occurring regularly and with some strength before hyoscine is given. The cervix must be taken up, and should admit two fingers. Hyoscine is not given whilst an elongated cervix can be felt.

As soon as pains are occurring with regularity and with ten to fifteen-minute intervals, a rectal or vaginal examination is made. If the cervix is effaced, and if the os

admits two fingers, the injections of hyoscine are commenced. If the cervix is not effaced chloral and bromide are given if the patient is complaining. If the cervix is effaced and dilated but pains are absent or infrequent an enema, or quinine 10 grains, is given, and as soon as good pains commence the hyoscine is started.

No distinction has been made between primiparae and multiparae, the indications for commencing the injections in both cases being the regular occurrence of pains, the effacement of the cervix, and commencing dilatation.

COURSE OF LABOUR

An important feature of the amnesic labour is the absence of the bearing-down efforts of the patient during the second stage. This absence of the action of the abdominal muscles does not retard the labour seriously, if at all, though the point is difficult to determine. Owing to the absence of visible bearing-down efforts it is difficult to tell from observing her whether the patient is in the first or second stage of labour, and unless frequent examinations are made the onset of the second stage will not be appreciated.

In this series of cases examinations, usually rectal, have been made to determine the state of the cervix before giving the initial injection of hyoscine. In many cases no further examination has been made: in others the descent of the head has been followed by one or more further examinations. These can always be made satisfactorily by the rectum, and only if in doubt as to the state of the cervix or the position of the presenting part in cases of delayed descent need a vaginal examination be made.

DURATION OF LABOUR

It has been observed that under hyoscine amnesia the total duration of labour is somewhat lessened (Jennings). In this series of cases it was not possible accurately to obtain the exact time of onset of labour. Instead, the duration of labour after the initial injection of hyoscine has been measured. It has not been found to be unduly long. The interval between the initial injection and the termination of the second stage in forty-seven cases was found to average 5.4 hours in primiparae and 4.5 hours in multiparae. The actual intervals were as follows. In thirty-two primiparae four cases were completed in three and a half hours or less, seven in over six and a half hours, whilst the majority, twenty-one, fell between four and six hours. In multiparae six were completed in three and a half hours or less, one took seven hours, whilst eight were between four and six hours.

These times represent the duration of labour after two-finger dilatation of the effaced cervix—that is, the time taken for the termination of the first stage and the whole duration of the second stage of labour. It was not deemed expedient to make the necessary examinations in order to determine accurately the duration of the second stage, but these figures clearly indicate that there is no serious delay in labour, if in fact there is any delay at all.

THE THIRD STAGE

There is no ill effect on the third stage nor is there any effect on the post-partum loss. In two cases the duration of the third stage was not noted; in one case the placenta was adherent and manual removal was necessary. In the remaining forty-seven the time varied from five minutes to thirty-five minutes, the majority being about fifteen minutes. In thirty-seven cases the duration of the third stage was between fifteen and twenty-five minutes, in three between five and ten minutes, and in seven between twenty-five and thirty-five minutes.

It was not found practicable to measure accurately the total amount of post-partum loss, but in no case was this excessive, nor did it differ from what experience has led one to expect after any normal labour.

RESTLESSNESS

The only drawback to the more general application of the method is the restlessness which occurs in about half the cases.

In this series twenty-three cases were restless, the symptoms varying from simple agitation during the pains to more decided efforts to get off the bed. The remaining twenty-seven cases were quiet, showing little reaction, except slight movements during pains. Of the restless cases three were very restless. In none of the cases did restlessness extend beyond the pains, all lapsing into somnolence during the intervals. These patients may cry out, kick, sit up, endeavour to get off the bed or to stand up, and they are very troublesome. The percentage of these very difficult cases is small. They require the time of two nursing attendants. The great majority of those classified as restless are easily controlled by one nurse. Of the twenty-seven quiet cases ten were very quiet, barely evincing evidence of the pains, and being comatose in the intervals.

There is no means of ascertaining which patients may be expected to be quiet and which restless. A nervous or hysterical patient may be most favourable, whilst a more stolid individual may give considerable trouble. The depth of amnesia is not affected by the behaviour of the patient, the very agitated and difficult cases being completely unaware of the trouble they may have caused. As mentioned, in this series of fifty cases, twenty-seven were quiet, twenty were restless and required active restraint, whilst three necessitated the presence of two nursing attendants for some hours.

THE PUERPERIUM

The puerperium was normal in forty-seven cases. Two cases developed recrudescence of pregnancy pyelitis, but in both cases, as the pyelitis had been present during the eighth and ninth months, this was to be expected, and does not mean that pregnancy pyelitis is a contra-indication to the method. One case developed puerperal mania, but here again the history was one of mental instability with two previous nervous breakdowns. During labour the pupils are widely dilated and remain so for some hours after delivery. Vision is blurred from paralysis of accommodation, but returns to normal within a few hours, the time varying with the amount of hyoscine given and the duration of somnolence after the labour.

Much has been written concerning the occurrence of terrifying nightmares after morphine-scopolamine narcosis. In my experience this is not true of hyoscine amnesia. The only two cases I have met with of unpleasant dreams after labour have been in two rather highly strung cases, and even these were not bad.

NEED FOR ADDITIONAL ANAESTHESIA OR FORCEPS DELIVERY

In twenty-two cases no other anaesthesia was necessary. In the remaining twenty-eight chloroform was given during delivery of the head. This additional anaesthetic is given rather to prevent restlessness than to alleviate pain. The twenty-eight cases in which additional chloroform was given included eight in which forceps were applied, and one case of delivery of the after-coming head. Of those receiving no other anaesthesia fifteen were quiet and the remaining seven restless. Of those receiving chloroform thirteen were quiet and fifteen restless. Two

cases were delivered by forceps without additional anaesthesia.

Owing to the non-participation of the patient during the second stage, the conscious bearing-down efforts are, as already stated, not present under hyoscine, though their absence has little effect on the descent of the head as far as the perineum. Descent may be aided to some extent by pressure exerted on the fundus during the pains. It has been my practice, if any delay occurs after the scalp can be seen at the vulva, to expedite the final stages by applying forceps. This has been done more particularly in the restless cases. In this series of fifty cases forceps delivery was necessary in ten. In seven of these low forceps were applied to help the head along the perineum. The remaining three included two cases of persistent posterior occipital rotation, and one of generally contracted pelvis. The instrumentation rate is thus low, and were it considered undesirable to apply low forceps at the termination of labour the figure could have been kept lower still.

EFFECT ON THE INFANT

Of the fifty infants two were stillborn. Of these, one was a post-mature foetus, presenting as a breech with extended legs and arms, and the other was a premature foetus (thirty-five weeks) with imperforate anus. The final injection of hyoscine had been given three hours before delivery in this latter case. A premature baby (thirty-six weeks) lived only eight hours. The last dose of hyoscine was given five hours before delivery. Of the remaining forty-seven babies one was noted as being blue at birth, and this was a thirty-fourth-week baby weighing 4 lb. 8 oz. It rapidly recovered and did well. In this case hyoscine had been given four hours before delivery. The remaining forty-six babies were normal in all respects, crying lustily at birth, and showing no signs of asphyxia or apnoea. It can definitely be stated that hyoscine, as given above, has no ill effect whatever on the foetus, even when given a short time before delivery. In this series the shortest interval between the last dose of hyoscine and the time of delivery was thirty minutes.

DURATION OF AMNESIA

Patients remember the first injection, sometimes the second, but never the third. The total duration of amnesia was between four and six hours in thirty-seven cases, below four in five cases, and above six in eight cases. In twenty-three cases there was no recollection of any event from one and a half to two hours before delivery; in twenty-two the amnesia extended back from three to five hours; in four amnesia was for one hour before delivery, and in one case for half an hour only, but in this case the third injection was given forty minutes before the child was born. In all cases there was no memory of the actual delivery, and amnesia extended for some hours afterwards.

The amnesia after delivery persisted for from one to two hours in forty cases, and in the remaining ten it was between three and five hours. *That is, it was not until from one to five hours after the birth of the child that the patient awoke to the realization of her surroundings. The patients appear well and smiling, and are generally incredulous when they learn that the baby has been born.* The most striking feature is their fresh and smiling appearance a few hours after delivery, compared with their flushed and often somewhat dishevelled appearance during the labour, and if one is inclined to abandon the method during the conduct of a particularly obstreperous labour, one is amply repaid by the sight of the placid, smiling patients, who have no knowledge of the trouble they may have occasioned.

CONCLUSIONS

It may be stated that hyoscine amnesia in labour has in my hands proved an entirely safe method, as regards both the mother and the child. Labour is not delayed, puerperal morbidity is not increased, and the babies are born without circulatory or respiratory defects. Amnesia is absolute, and covers a period including the whole of the second stage of labour. There have been no fatalities nor accidents attributable in any way to the hyoscine.

The only disadvantages are the need for constant supervision during the labour, and the occasional necessity for two nurses to control the patient. I do not wish to minimize this difficulty, as it is a real one, and the only serious objection to a more general use of the method. It may, however, be emphasized that restlessness occurs in less than half the cases, and is only of serious degree in a small minority—three cases in this series of fifty.

I have never adopted hyoscine amnesia in domiciliary midwifery, and would not do so unless I could be assured of the presence of the possibly necessary skilled assistants. I consider that the best results will always be obtained when one has the assistance of a nursing staff who are thoroughly acquainted with the details of the treatment. The cases in this series have been consecutive and were treated in one nursing home with a constant nursing staff.

SOME OBSERVATIONS ON THE SYMPATHETIC NERVOUS SYSTEM *

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The sympathetic nervous system and the parasympathetic make up the autonomic nervous system, with which the endocrine glands are in close association. I would, at first, like to call your attention to one or two facts which indicate that the sympathetic system is anatomically arranged to give a widespread physiological effect on stimulation, and that all its diverse activities are co-ordinated to produce in the body the response required to meet most favourably circumstances arising at any particular moment. The bilateral ganglionated cord of the sympathetic system reveals a ganglion for each segmental area of the body (except in the cervical region, where fusion has reduced the number to three); from each ganglion sympathetic fibres proper are carried to each of the spinal nerves by the grey rami for distribution to the somatic areas. The connexions of the ganglia to the cord, however (named white rami), are confined to the dorsal and upper lumbar spinal segments, and each of the fibres making up the white rami synapse with several cells in the sympathetic chain, so that a generalized body effect is produced by stimulation passing out of the cord in a comparatively restricted area. The splanchnic nerves spread their impulses widely in a similar way to the viscera. Moreover, there is a central control situated in the hypothalamic region at the base of the brain, which is, in turn, influenced to some extent by the cortex.

Woollard and Norrish (*Brit. Journ. Surg.*, 1933, xxi, 83) say: "It is to be inferred that the autonomic system as a whole appears comparatively late (in development), and of its three portions the sympathetic system (keeping this term for the thoraco-lumbar outflow) is the last of all to appear." Another feature in development which seems to run parallel with the perfecting of a sympathetic system is the independence of the organism of vagaries in its external environment. This is accomplished by a mechanism for keeping constant the internal environment in all

the many conditions which are always tending to its variation, and the co-ordination of the components of this mechanism are apparently controlled by the sympathetic system and its closely associated allies. The more urgent the demand on this mechanism the more does it seem to be controlled by the sympathetic nerves. In quiet conditions, presumably, the endocrine glands are sufficient protection, since it has been shown by Cannon that the whole of the peripheral ganglionated cords of the sympathetic system can be removed in an animal; and, provided it is not exposed to great variations in temperature or to any other condition which might demand a struggle for existence, it can live comfortably and without difficulty.

If one keeps in mind this fundamental purpose of the sympathetic nervous system it is easy to understand its apparently contradictory action on tissue of the same character: for example, stimulation by strong emotions causes constriction of the unstriated muscle of the peripheral vessels and relaxation of the unstriated muscle of the intestine and bronchioles, the object being to force blood into such important organs as the brain and the heart, to conserve energy which would otherwise be expended on intestinal activity—for the moment wastefully—and to ensure a freer supply of air to oxygenate the rapidly moving blood. Moreover, the spleen is contracted, whereby a large number of red cells are forced into the circulation to carry an increased supply of oxygen to the hyperactive tissues, where rapid oxygenation is essential; and sweating (another sympathetic function) dissipates the heat so engendered, which would quickly become dangerous if not eliminated. I want to emphasize this aspect of the sympathetic system, because surgery has become rather busy with it in recent years, and the localized nature of the operations is apt to make us rather forgetful of the generalized activities of the sympathetic, with which surgery has had little to do as yet.

The chief conditions for which operations have been performed on the sympathetic nerves can be arranged under four headings: (1) vascular; (2) secretory; (3) dysfunction of unstriated muscle of hollow viscera; and (4) certain painful conditions.

ACTION OF SYMPATHETIC NERVES ON VESSELS

The predominating effect of the sympathetic nerves is constriction of the vessels. The more unstriated muscle in the wall the more is the vessel influenced by the vaso-constrictors; consequently the large vessels are little affected, whereas the small arteries can be constricted to the point of complete closure. Section of the vaso-constrictors releases the vessel from its normal tonicity, and dilatation results. It is not known whether there are vaso-dilator fibres to the vessels; if there are, they are probably parasympathetic in origin, and take the same peripheral course as the sympathetic nerves—that is to say, run in the ordinary spinal nerves and innervate the vessels by branches distributed as they pass along the limbs. A limb deprived of its sympathetic supply becomes hot and, at first, rather red, and sweating cannot be induced by normal means. In the course of a few days the redness lessens and the extremity becomes rather paler than the normal side; this is said to be due to the capillaries regaining some tone. The blood, however, still flows more quickly, and the part remains permanently warmer than the other side.

Raynaud's Disease

This being the case it seemed reasonable to expect sympathectomy to be beneficial in conditions which are obviously due to vasospasm, the typical example being Raynaud's disease. This is a paroxysmal, bilateral vasospasm of the digital arteries provoked by cold or emotion in certain subjects, and in severe cases it goes on to

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