

ORIGINAL COMMUNICATIONS.

ON THE ADMINISTRATION OF CHLOROFORM DURING PARTURITION.

By JOHN SNOW, M.D.

It is unnecessary now to employ or allude to any of the abstract reasons which have been given for using or withholding chloroform during labour, since a sufficient number of observations have been made to enable the question to be decided by experience. I believe that no one disputes the power of chloroform to relieve the sufferings attendant on parturition; and, therefore, the only consistent objection that can be made to it is, that some danger or disadvantage may arise from its use. It is well known that, out of the vast numbers of patients to whom this agent has been administered for the performance of surgical operations, a few have unfortunately died whilst inhaling it, or a minute or two afterwards; but it is satisfactory to know that no accident of the kind has happened in the practice of midwifery. This should not be looked upon as a mere coincidence, for there are sufficient reasons for concluding that there is no danger from the exhibition of chloroform during labour by a medical man using ordinary care, even though he may have had no previous experience in its employment. In the first place, the effect which it is necessary to produce in parturition is so much slighter than is required for a surgical operation, that it is not necessary to approach even half way to a point that would be dangerous if it were exceeded; and, in the next place, the chloroform never requires to be given except whilst there is pain, the relief of which serves as a sign for its discontinuance; which sign is not present in exhibiting it preparatory to the commencement of a surgical operation.

There have, however, been some cases in which death has been attributed by certain authors to chloroform, which had been administered during labour. Dr. Ramsbotham relates one such case;* but I doubt whether he would have considered the result to be due to this medicine, if he had had an extensive experience of its use, either in obstetric or any other class of cases. The chloroform was given occasionally, and apparently very judiciously, during the last four or five hours of labour in this case. Dr. Ramsbotham relates that, at the conclusion of the labour, "the uterus contracted well, and the patient appeared comfortable. At the end of an hour and a half, however, distressing dyspnoea came on, attended with excessive lividity of the face, and all the signs of extensive engorgement of the lungs and heart. Her respiration became more natural under the means employed, and in three hours and a half she lay down to rest; but in half an hour she suddenly arose with a return of the most distressing dyspnoea: this was soon followed by convulsions, and almost immediate death." No inspection of the body took place.

A case somewhat similar to the above occurred in the practice of Dr. Murphy, who, however, does not attribute the fatal result to the action of chloroform.† In this case, the chloroform was exhibited very sparingly during the last two hours of labour, the patient not being rendered unconscious. She fell asleep after the expulsion of the placenta, but awoke in two hours with cough and difficulty of breathing. These symptoms increased in spite of treatment, and the patient died a little more than twenty-four hours afterwards. The lungs were found to be greatly congested, and the kidneys were in a pretty advanced stage of granular degeneration.

Fatal congestion of the lungs is one of the results of Bright's disease. I have seen it in the male subject. It is not improbable that, in the case related by Dr. Ramsbotham also, there was either permanent disease or temporary congestion of the kidneys, and that toxæmia existed

in both cases. The occurrence of convulsions a little before death in the latter case renders this the more likely.* At all events, the symptoms in the above cases do not coincide in the least with the known effects of chloroform, even when exhibited much more freely. It must be remembered also, that the unfavourable symptoms did not commence till an hour or two after the effects of the chloroform had subsided; and in this time the system gets more thoroughly rid of this medicine than of a dose of opium in two or three days.

As chloroform is not a preventive of all the "ills that flesh is heir to", it might be expected that puerperal mania should happen after some few of the many cases in which it is used, especially as it has been inhaled more generally by sensitive and susceptible patients than by others. Dr. Ramsbotham alludes, in a foot-note,† to an attack of puerperal mania "which had supervened on the exhibition of chloroform"; but he does not state at what period the mania commenced; whether, for instance, it was an hour or a month after the inhalation. Other cases, or possibly this same one, have been mentioned in the medical societies; but no particulars have been related. I have been told respecting one case of puerperal mania, that the patient had long been in the habit of inhaling chloroform very freely (taking it often when no one was present), to prevent attacks of epilepsy, to which she was subject.

It was said that, in some of the early cases in which chloroform was employed, the uterine contractions were so much enfeebled by it, that delivery had ultimately to be accomplished by the use of the forceps. It is not improbable that the over free use of this agent might lead to such a result; but I believe it would not arise from its judicious use. It has happened that, in all the cases of manual and instrumental delivery in which I have given chloroform, it was exhibited only in consequence of the operation; for the other cases in which I have administered it have all terminated without artificial assistance.

The propriety and advantages of administering chloroform in parturition being admitted, a frequent inquiry is, "In what cases ought it to be employed?" It will be readily conceded that, in cases where the pain is not greater than the patient is willing to bear cheerfully, there is no occasion to use chloroform; but when the patient is anxious to be spared the pain, I can see no valid objection to the use of this agent, even in the most favourable cases. The benefits arising from chloroform in severe cases of labour are experienced in a lesser degree in favourable cases; and the patient may be fairly allowed to have a voice in this, as in other matters of detail which do not involve the chief results of the case. The determination of the kind of labours in which chloroform should be used or withheld is really a matter of not much importance, because, as we pass from cases that are severe and protracted to those which are short and easy, the quantity of chloroform that is used, and the amount of diminution of the common sensibility, and of interference with the mental functions, become so trifling, that very little remains about which to hold a discussion. Indeed, from what I have observed of the continued use of this agent in medical cases, and its use by healthy persons for experiment, I believe that the quantity which is inhaled in a short and easy labour might be continued daily for an indefinite period, without appreciable effect on the health.

The above remarks apply also in some measure to the question as to the period of the labour when the exhibition of chloroform should commence; for, in proportion as the pains are feeble, it must be more sparingly administered. The most usual time when the accoucheur and I have determined that the inhalation should be commenced, has been when the os uteri was nearly dilated to its full extent, and the pains were taking on an expulsive character. In many of the cases which I have attended, it has, however, been commenced much earlier; for the suffering caused by

* Principles and Practice of Obstetric Medicine. Third edition, p. 160.
† See Lectures on Parturition, p. 474.

* See ASSOCIATION JOURNAL, January 21st, p. 64.
† Opus cit., p. 154.

the dilating pains in the first stage of labour is often very great, and the chloroform is consequently of the utmost service when employed at this time.

As regards the manner of giving chloroform, I shall first allude to cases not requiring manual or instrumental assistance. In such cases, when it has been determined to resort to inhalation, the moment to begin is at the commencement of a pain; and the chloroform should be intermitted when the uterine contraction subsides, or sooner, if the patient is relieved of her suffering. It is desirable to give the chloroform very gently at first, increasing the quantity a little with each pain, if the patient is not relieved. The practitioner easily finds, with a little attention, the quantity of vapour which it is desirable to give at any stage of the labour, and in each particular case; his object being to relieve the patient without diminishing the strength of the uterine contractions and the auxiliary action of the respiratory muscles, or with diminishing it as little as possible. At first, it is generally necessary to repeat the chloroform at the beginning of each "pain"; but, after a little time, it commonly happens that sufficient effect has been produced to get the patient over one or two uterine contractions without suffering, before it is resumed.

When the practice of inhalation in midwifery was first introduced by Dr. Simpson, he very naturally adopted the plan which is usually followed in surgical operations, making the patient unconscious at once, and keeping her so to the end of the labour. It was soon found, however, by other practitioners, that this is not necessary; and indeed it would not be safe in protracted cases. Drs. Murphy and Rigby were, I believe, amongst the first to state that relief from pain may often be afforded in obstetric cases, without removing the consciousness of the patient; and I soon observed the same circumstance.* Some persons indeed have alleged that the pain of labour can always be prevented, without making the patient unconscious of surrounding objects; whilst others have asserted that no relief can be afforded unless unconsciousness be induced. But both these opinions are directly opposed to experience. There are comparatively few cases in which the suffering can be prevented throughout the labour without interfering with consciousness, although there are very many cases in which it can be in this way prevented in the early part of the labour. This difference depends in some measure on the constitution of the patient, but chiefly on the severity of the pain to be prevented. It is in accordance with what is observed in medical and surgical cases, that the pain should be removed in some instances without abolishing consciousness, and that in other instances it should not; for, in certain cases of neuralgia, the pain is so severe, that no material relief can be obtained by chloroform as long as consciousness is retained; and in surgical operations, although it now and then happens that the minor and concluding parts of an operation, such as tying vessels and introducing sutures, can be performed without pain, whilst the patient is consciously looking on, a free incision in the skin can hardly ever be made under similar circumstances without pain.

The external evidences of the uterine contractions continue as before, when the patient is rendered unconscious by chloroform; and the muscles of respiration are called freely into play, to assist the action of the uterus in the second stage of labour. The aspect of the patient under these circumstances, is generally that of one who is suppressing the expression of her sufferings; and any relative or friend who comes in, without knowing that chloroform has been given, begins to praise the unconscious patient for her fortitude. On some occasions, indeed, there are groans and cries, as of suffering; but the mind being unconscious of pain, it can hardly be said to exist.

It may be remarked, that complete *anæsthesia* is never induced in midwifery, unless in some cases of operative delivery. The diminution of common sensibility to a certain extent, together with the diminution or removal of con-

sciousness, suffice to prevent the suffering of the patient during labour; and she never requires to be rendered so insensible as in a surgical operation, when the knife may be used without causing a flinch or a cry. The nerves of common sensation must be allowed to retain their functions to a certain extent during labour; otherwise the assistance of the respiratory muscles, which consists of reflex action, or "motion arising from sensation, without the aid of volition", would not take place, even if the contractions of the uterus should still continue.

The effects of chloroform on the brain should not be carried during labour beyond what I denominate the second degree of narcotism, or that condition in which the mental functions are diminished, but not altogether suspended, except when the effect of the vapour is associated with natural sleep. The patient under the influence of chloroform to this extent, has no longer a correct consciousness of where she is, and what is occurring around her, but is capable of being aroused to give incoherent answers, if injudiciously questioned. In this state, the patient will sometimes assist the labour by bearing down voluntarily, if requested to do so, and be otherwise obedient to what is said; and by withholding the chloroform for a few minutes, she at any time becomes quite conscious. As a general rule, it is desirable not to hold any conversation whilst the patient is taking chloroform, in order that her mind may not be excited. The plan mentioned above, of giving the chloroform very gently at first, also has a tendency to prevent its causing mental excitement, the patient coming gradually under its effects. In surgical operations, excitement of the mind can nearly always be avoided by carrying the patient pretty rapidly into a state of insensibility, in which the mental functions are necessarily suspended. But in the practice of midwifery, it is not allowable to cause a state of coma or insensibility, except in certain cases of operative delivery, hereafter to be mentioned.

I nearly always employ, in obstetric cases, the inhaler that I use in surgical operations.* There is not the same necessity for an accurate means of regulating the proportion of vapour in the air which the patient is breathing during labour, where but a trifling amount of narcotism requires to be induced, as in surgical operations, where a deeper effect is necessary; still I find the inhaler much more convenient of application than a handkerchief, and it contains a supply of chloroform which lasts for some time, thereby saving the trouble of constantly pouring out more. When I do administer chloroform on a handkerchief during parturition, I follow the plan I recommended in a former communication on this subject,† of putting only about fifteen minims of chloroform on the handkerchief at one time.

The quantity of chloroform administered during any one pain, never exceeds a very few minims; but the quantity used in the course of a protracted labour is often considerable. Two ounces and a half by measure is the largest amount I have used in one case; but, as the apparatus was used, this quantity would go as far as seven or eight ounces employed in the most careful way on a handkerchief. I have not kept any patient continuously unconscious for more than two hours; and eight hours is the longest time I have had to administer chloroform in any case, but it has been continued for a much longer period without ill effects, by Dr. Simpson and others.

Chloroform can be best applied when there is an additional medical man, who has not to attend to the ordinary duties of the accoucheur; but it can be given very well by the accoucheur himself, so as to save the greater part of the suffering of labour; although he perhaps cannot always administer it in the perfect way in which he could, if he had no other duties to divide his attention.

It is probable that the use of chloroform has no particular influence over the duration of labour, in the whole

* This plan has been described, *Med. Gaz.*, vol. xlii, p. 848.

† *Lond. Journ. of Med.*, vol. i, p. 54. It should be recollected that minims of chloroform are very different from drops; two minims being equal to nine drops from the lip of a small phial.

number of cases in which it is employed; but individual labours are occasionally either retarded or quickened by it, according to circumstances. In some cases, the chloroform, even when very moderately employed, diminishes both the strength and the duration of the uterine contractions, and prolongs the interval between them, thereby making the labour somewhat longer—a matter of no consequence, however, as the patient is not suffering in any way. In other cases, the inhalation causes the uterine action to become stronger and more regular, by removing the excess of sensibility by which it has been interfered with. This occurs more particularly in the first stage of labour. In some cases, also, the chloroform seems to act as a direct stimulant to the uterine contractions, increasing their force and frequency—a circumstance at which we need not be surprised, when we remember that both opium and brandy, in moderate quantity, often act in the same manner. Chloroform has also the effect of promoting the dilatation of the os uteri in many cases, even when no rigidity exists; and when there is rigidity of the os uteri, the inhalation is of the utmost service, and shortens labour very much. This is the case, also, when there is rigidity of the perineum.

During delivery with the forceps, or by perforation, the chloroform requires to be administered very much in the same way as in ordinary cases. It must be given at each pain, so as to prevent the suffering of the patient without checking the uterine contractions. It generally, however, requires to be given a little more freely than in natural labour. Dr. Murphy has related three cases of delivery by the forceps, and one by perforation,* in which I assisted him, four or five years ago, by giving chloroform and Dutch liquid, which I was trying at that time. The operations were chiefly undertaken on account of deformity of the pelvis; and the patients all recovered very favourably. I have given chloroform in only one case of midwifery in which the knife was used. It was a case of Dr. Murphy's, in which he had to make an artificial os uteri. Of course, under such circumstances the patient is made insensible at the time of operation.

When it is necessary to introduce the hand into the uterus to turn the child, the chloroform requires to be given in a pretty full dose, so as to suspend the uterine contractions; and as soon as the operation of turning is performed, the inhalation should be discontinued for a short time, to allow the action of the uterus to return, and assist in the expulsion of the child. In the autumn of 1849, I administered chloroform in a case of presentation of the shoulder, attended by Mr. French, of Great Marlborough Street, and in a case of presentation of the elbow, attended by Mr. Marshall, of Greek Street, Soho: the operation of turning was performed with singular facility in both cases, although the membranes had been ruptured, and the liquor amnii evacuated some time. The uterus afterwards contracted well in both cases, and expelled the placenta in a few minutes. In a case of natural presentation, in which turning was performed by Dr. Murphy, on account of narrowness of the pelvis, and the impossibility of applying the forceps, the introduction of the hand was difficult from want of space, but the uterus offered no resistance.

In other cases in which it is necessary to introduce the hand into the uterus, chloroform is of equal service. On Dec. 26, 1850, I was requested by Mr. Cooper, of Moor Street, Soho, to assist him in a case of retention of the placenta. The patient had given birth to a child two hours before, and Mr. Cooper had introduced his hand, but had been quite unable to bring away the placenta, on account of firm contraction of the uterus, in a sort of hour-glass form. On the chloroform being administered, the hand was easily introduced, and the placenta detached and extracted. There was very little hæmorrhage. I may here state that I have seen hæmorrhage, to any considerable amount, in only one case in which I have given chloroform, and the patient had suffered from it in some of her previous confinements.

It is often asked, whether the chloroform has any effect on the child. It is quite certain that the fœtus must receive a portion of the chloroform into its circulation, as it does of any other medicine which is absorbed into the blood of the mother; and when sulphuric ether was the agent employed, its odour could be perceived in the child's breath after birth. The fœtus must therefore be influenced by the chloroform, though generally to a less extent than its mother, as it receives its dose only at second-hand. It has seemed in some cases that the child was less acutely sensible to the cold air than usual at the time of its birth; and when the mother is unconscious from chloroform, I have not seen it kick and scream in the violent way, and grasp the bed clothes with the force, during the first minute after its birth, that is often observed under other circumstances. With these exceptions, no effects of the chloroform on the child can be perceived.

18, Sackville Street, June 1st, 1853.

FACTS RELATING TO SCARLET FEVER.

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It would be, on my part, a waste of time and of words to offer any introductory observations on the importance of the disease "Scarlet Fever", or to expatiate on the propriety of investigating the laws by which it is governed. Premising, therefore, that in this essay all theoretical questions in relation to the disease will be let alone, and that matters of fact only will be introduced, I proceed to direct attention to the following subjects:—

- I. Types of Scarlet Fever;
- II. Occurrence of Scarlet Fever at different Periods of Life;
- III. Prevalence of Scarlet Fever in the Sexes;
- IV. Influence of the Seasons over Scarlet Fever;
- V. Recurrence of Scarlet Fever in the same Person;
- VI. Mortality of Scarlet Fever.

I. TYPES OF SCARLET FEVER.

There is perhaps some excuse for the practice that has sprung up and engrafted itself on the professional mind, of recognising three shades or types of scarlet fever; but there is no excuse or reason why these shades or types should receive distinct names; and I would strongly recommend what has been recommended, I believe, by Dr. Watson, that medical men, in speaking of scarlet fever, whether amongst themselves or with their patients, should drop the terms *scarlatina*, *scarlatina anginosa*, etc., altogether, and should call every case of the affection *scarlet fever*; for the disease is an unit, and should be spoken of as one. If indeed a multitude of cases are brought together, and are closely watched by one observer, the unity of the disease cannot fail to become evident, from the universal presence of several important and special symptoms; and from the non-recurrence, as a general rule, of the disease under any type in a person who has once suffered from it in one or other of its forms.

I must remark, however, that, in practice, certain cases are occasionally met with, resembling scarlet fever in many points, in which it is highly difficult, perhaps impossible as yet, to determine whether or not they are true cases of that disease. Let me, in illustration, give a brief description of two such cases, which have within these last six months fallen under my notice.

A young woman, a servant at an inn, was seized with slight shiverings, sensations of chilliness, weight in the head, and thirst. These symptoms lasted about twelve hours, when the body became covered with a bright red rash, the throat sore, and the tongue loaded and white. She was kept in bed, and ordered a simple effervescing

* Observations on Chloroform in Midwifery.