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The Use of Morphia in Eclampsia, with a Report of Two Cases.

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I DESIRE in reporting the following cases to bring to the attention of the Society a form of treatment which deserves a more careful study than has hitherto been devoted to it. Morphia should not be relied upon as a safe means of treating every case of eclampsia, but there are cases in which its use can be replaced by that of no other form of treatment. The first of the two cases which follow, although not an absolute proof of this latter proposition, shows a result which compares more than favorably with that obtained by the more accepted plans of treatment. The second case affords an instance in which the indications for treatment were met exactly by the use of morphia.

Case I. — The patient, a primagravida, aged 21, was admitted to the hospital, without history, at 9 P.M., March 10, 1890. She was delirious and restless. Her countenance was œdematous, corresponding to the general œdema which was present. The os admitted one finger. There were no labor pains. The fœtal heart sounds were detected on the right side below the umbilicus. The first convulsion after admission occurred at 9.25, the next at 10.5, the next at 11 and the last at 6 A.M., March 11. At 2 A.M. the patient was in a state of narcosis from the effects of morphia, which was given after each convulsion in the following doses: .01 gramme, .01 gramme, .02 grammes, .02 grammes, amounting to .06 grammes, or gr. $1\frac{1}{5}$ in eight hours and a half. Chloroform was administered at the time of each convulsion. At 8 A.M. the patient showed great restlessness, probably due to labor pains. The labor was terminated naturally at 2 P.M., the second stage lasting only a half hour. The child, which was born at the end of the eighth month, was living. The urine, upon boiling, after the addition of acetic acid, showed albumin equal to one-third the volume. The secretion in twenty-four hours amounted to

[1] Read before the Obstetrical Society of Philadelphia, April 7, 1892.

twenty-one ounces. The patient was discharged on the sixteenth day; the œdema had almost disappeared, and an examination of the urine showed a small amount of albumin and granular casts.

Case II.—A Pole, aged 20, also a primagravida, was admitted to the Lying-in Charity, October 16, 1891. In the eleven hours preceding her entrance to the hospital she had had thirteen convulsions. She was comatose in the interval between the attacks, but the approach of each convulsion was marked by restless delirium. Morphia was administered hypodermically as follows:

5.30 P..M . . . . . gr., ½
9.00 P.M. . . . . gr., ¼
2.30 A.M. . . . . gr., ⅛
5.30 A.M. . . . . gr., ⅛

During the afternoon of the day succeeding that of her admission she was given gr. ¼, making gr. 1¼ in twenty-four hours. Between the hour of admission (5.30 P.M.) and 11 P.M., in which time gr. ¾ had been given, there were but three convulsions, each less severe and of shorter duration than the preceding. The patient was bled at 11 P.M., on account of the vascular tension, shown in the congestion of the face and throbbing of the arteries. Fifteen ounces were abstracted. The convulsions ceased after this, but the morphia was continued, as noted above, to control the restlessness. During the next twelve hours sufficient morphia to keep the patient narcotized was administered. Within the sixteen hours after admission twelve ounces of urine, containing one-third volume albumin, were voided. Elaterium, gr. ⅛, calomel, gr. iii, were given. On the morning of the second day labor came on, and in five hours after the first signs were noticed a macerated child was born. The hospital chart gives the following:

Duration of first stage, not noted.
" of second stage, five hours.
" of third " six "
Extraction of placenta.

On the day following her labor the patient suffered from a chill, the temperature rising to 101⅘°. Necrotic shreds of decidua were removed by an intrauterine douche. The patient's recovery was uninterrupted, and she was discharged on the twelfth day. An examination of the urine, obtained by the catheter two days after labor, revealed a few granular casts. The quantity of albumin gradually decreased until upon dismissal a mere trace was revealed by the ring test. In this case only slight œdema was present.

The first of these cases I had the privilege of observing under the direction of Prof. Winckel. The treatment was outlined by him, notwithstanding his advocacy of the use of chloral. In his work on obstetrics (1886) he describes his treatment as follows: "When convulsions supervene I treat them, without exception, with chloral, gr. xv–xxx at each dose, by enema, and with chloroform. As soon as the patient becomes restless and the first signs of an approaching attack appear, chloroform is administered and continued until the spasms have ceased. The chloroform serves as a sedative until the chloral can act. The dose of the latter is repeated after each seizure, and the amount is increased without risk, until three drachms in twenty-four hours are given." His recognition, however, of the claims advanced for morphia

appears in the following sentence: "It must by further observation be shown whether morphia will exclude the accepted treatment by chloral and chloroform."

In studying the treatment of eclampsia, it is important, first, to distinguish between the form of treatment, which is effective in the convulsive stage, and that in the stage of threatening intoxication. Veit, the strongest advocate of morphia, recommends in his clinical teaching, not the exclusive use of morphia, but its combination with eliminative treatment. Winckel, who is the exponent of the chloral treatment, emphasizes as an introduction to the subject of the therapy of eclampsia the usefulness of the treatment by catharsis and diaphoresis as follows: "In the last ten years I have come gradually to the adoption of the following measures, the advantages of which I have recognized over those of other forms of treatment. To every gravida whose urine contains albumin to a marked extent, is given, daily, a pill of aloes and colocynth, in order to induce a decided cathartic effect. In addition to this a warm bath is given. Secondly, we must consider the previous history of the case, the amount of albumen which has been present, the presence of tube casts, the deficiency in the excretion of urea and the severity of premonitory symptoms; for on these depends the choice between the induction of labor and palliative measures. Thirdly, we must take into consideration the constitution of the patient. Strong, full-blooded women, who present the signs of vascular obstruction, are benefited by bleeding. In eclampsia we not only have the condition so aptly described by Auvard as a "strike on the part of the organs of elimination," but we have also three other elements entering into the pathology, namely:

(1) The presence of a source of irritation.

(2) The increased vascular tension.

(3) The increased nervous tension.

Venesection certainly relieves two of these conditions—the two former—by eliminating some of the poison in the blood and by reducing the vascular tension. How far the effect, in these directions, of the bleeding influences the third element in the pathology, the increased nervous tension, is a question of much importance.

Morphia on the one hand and chloral on the other are given to meet special indications, and are not advocated, either as substitutes for other forms of treatment or to the exclusion of important accessory measures. Morphia is no longer useful when the convulsions and restlessness have ceased and the patient has fallen into coma. Its influence lies in its power to control convulsions; its danger is to be looked for in its effect upon the process of elimination. Whatever may be the pathology of eclampsia and whatever the relation between the condition of the kidneys and the convulsions, it is clear that in eclampsia elimination is checked. When elimination is restored by diaphoresis, venesection or diuresis, the patient is benefited. It is equally clear that, unless the convulsions are controlled by chloroform, chloral, morphia, or by the induction of labor, the termination of the case is likely to be fatal.

It is possible, by resorting to early treatment during pregnancy, to avert

the dangers of eclampsia; but a time comes in the treatment of certain cases where the choice must be made between those measures which will act, if time is given for their effect, and those which will act at once. These are the cases in which the convulsions are threatening life. The question is, in such cases: What are the means at our disposal which are most effective in controlling the convulsions? In the second case which I have reported, each injection of morphia was followed by a cessation of delirium and was effective in averting the convulsion. It is doubtful whether chloral would have been so rapid in its effects, for the advocates of the treatment by chloral recommend the administration of chloroform to quiet the patient until the chloral acts.

Morphia is serviceable, not only on account of the promptness of its action, but because it favors rather than retards the process of elimination in one direction, namely, by diaphoresis. The danger from its effects upon the kidneys has been overrated. Upon looking closely into the subject we find that morphia decreases to a slight extent only the excretion of urea. Wood, Bruton, Loomis,[1] in discussing the treatment of uræmia, allude to morphia "as an agent that not only has the power to control muscular spasm, but at the same time, by its action, tends to reopen the avenues of elimination, either by counteracting the effects of the uræmic poison on the nerve-centres, and thus facilitating the action of diuretics and diaphoretics, or itself acting directly as an eliminator." He cites a number of cases of uræmic poisoning, one of them a case of ante-partum eclampsia, in which morphia was used successfully. The description of two of these cases will serve to show the action of morphia. The first case was that of a middle-aged man, suffering from chronic nephritis, in the course of which he was threatened suddenly with uræmic symptoms. These failed to yield to purgation and baths, and recourse was had to hypodermic injections of morphia. As a result, the patient fell into a quiet sleep, during which diaphoresis was established. Twenty to thirty drops of Magendie's solution were given once a day for a number of weeks, together with one half-ounce of infusion of digitalis twice daily. The second case was one in which the convulsions of acute uræmic intoxication were arrested by morphia. The treatment was followed by profuse diaphoresis. Four hours after this the catheter was used, and five ounces of highly albuminous urine, containing blood and granular casts, were drawn. Loomis adds in conclusion: "It would appear that if a large hypodermic injection of morphia be administered at the onset of uræmic eclampsia, and repeated whenever the premonitions of a convulsion are present, we offer these distressing cases the best chance of recovery. The almost uniform effect of morphia so administered is, First, to arrest muscular spasms, by counteracting the effect of the uræmic poison on the nerve-centres; Second, to establish profuse diaphoresis; Third, to facilitate the action of cathartics and diuretics, especially the diuretic action of digitalis."

If we can be thus assured of the eliminative action of morphia, we have

[1] New York Medical Record, 1873.

in its use a form of treatment presenting the advantage of both controlling the convulsions and aiding the excretion of the toxic element in the blood. I believe, however, that this is claiming too much for it, and that if we accept this we shall be tempted to use morphia in cases where other forms of treatment are demanded; for instance, in cases where venesection, chloral in its milder and slower effect and the induction of labor are indicated. This assertion, however, does not vitiate the claim of morphia to the first place among those drugs which are used for prompt sedative action.

The results of carefully collected and carefully noted cases, at the hands of various observers, will alone solve the question of treatment. No practitioner can rely upon one drug or upon one method of treatment; we must have at our command all the resources in treatment, and must learn, from experience, which from among these to select. If this experience can be broadened by the study of the cases in other hands, the number of our resources is increased. Within a year two important discussions upon the subject of eclampsia have appeared in print; one in THE ANNALS OF GYNÆCOLOGY AND PÆDIATRY, April, 1891, entitled "Disease and Functional Insufficiency of the Kidneys in Child-bearing Women, by B. C. Hirst;" the other "A Discussion on Puerperal Eclampsia, in the Section of Obstetric Medicine and Gynæcology, at the Annual Meeting of the British Medical Association, held in Bournemouth, July, 1891." It will be of interest to examine critically the remarks on treatment contained in both of these papers. In the first Dr. Hirst presents briefly the report of eight cases, two of which terminated fatally; the treatment in each case was as follows:

Case I.—Chloral by the bowel, croton oil, chloroform as soon as premonitory signs of the attack appeared, and a hot wet pack.

Case II.—The treatment was the same as in Case I, with the addition of moderate bleeding.

Case III.—Bromide of potash, gr. cxx; chloral, gr. lxxx; morphia, gr. $\frac{1}{4}$, hypodermically; croton oil, gtt. 1, and elaterium, gr. $\frac{1}{10}$. Hot wet pack for more than two hours.

Case IV.—Chloral and bromide of potassium, croton oil, chloroform, hot wet pack and venesection to a moderate degree.

Case V.—Treatment not mentioned.

Case VI.—Chloral, chloroform and hot pack.

Case VII.—Chloral, anæsthesia, hot pack and bleeding to the extent of twenty-four ounces.

Case VIII.—A dessertspoonful of concentrated salts solution, every fifteen minutes, for sixteen hours; sixteen ounces in all.

In the second paper the treatment, in order of preference, of those who took part in the discussion, was as follows:

Galabin.—Venesection, to relieve venous congestion of the lungs and to arrest the convulsions.

Byers.—States that next to chloral, morphia, given subcutaneously, seems most useful in controlling convulsions.

Donovan.—In cases of threatened eclampsia, with marked albuminuria, small doses of chloral, saline, purgatives.

Edis. — Chloroform, followed by either venesection or the administration of either chloral or morphia.

Swayne.—Venesection, followed by chloroform and chloral.

Auvard. — Eliminative treatment, anæsthesia, venesection.

Lawton.—Nitroglycerine, morphia.

Lawrence.—Chloral, hypodermic injections of veratrum viride.

Heywood-Smith and Harvey.—Blood-letting.

Cameron.—Alludes to the effect of morphia in dilatation of the cervix, thereby hastening the delivery.

The majority of those who took part in this discussion advocated the prophylactive treatment by the induction of labor in threatening cases. This coincides with the views expressed by Hirst[1] and Fry[2] in this country.

From a review of these discussions we learn that the choice of treatment depends upon the indications. The advocate of any single form of treatment finds himself at a loss in certain cases, and there are few who can say: "If I were compelled to employ but one remedy, it would be this or that." Morphia cannot be relied upon solely; there are conditions which interdict its use. Tyson states:[3]

"Notwithstanding the enormous number of favorable cases which have been reported from the hypodermic use of morphia, I would still be afraid to recommend it in these cases. The reason the morphia treatment of eclampsia is not attended by fatal termination, I think, is tolerably plain. The vast majority of cases of Bright's disease, in connection with pregnancy, are cases of parenchymatous nephritis or tubal nephritis. These cases bear morphia tolerably well. On the other hand, it is well-known that cases of interstitial nephritis do not bear the use of opiates." The risk here, however, is not so great as appears at first sight, for interstitial nephritis is not commonly associated with eclampsia. Galabin asserts that "Recent acute nephritis is commoner than the existence of a contracted granular, or even a large white kidney." Excluding the chronic forms of Bright's disease, the objection to the use of morphia, on account of kidney affection, is unfounded, according to Fancourt Barnes,[1] who states that in the majority of cases the convulsions are not due to nephritis, and asks: "If there be any analogous example of acute inflammation of an organ passing away in a few hours or even minutes." Wood, on the other hand, writes as follows: "Whenever the kidneys are seriously diseased the physician should be exceedingly careful in the administration of opiates, because the chief channel through which they are eliminated is choked up."

It appears that we have to deal with views which are diametrically opposed. In contrast to the opinion of Wood, we have again the teaching of Veit, who impressed his listeners with the idea that they held in their hands the means of rescuing every woman in eclampsia, namely morphia, and the responsibility of a fatal case rested with them should they fail to use this means.

In conclusion, let us study for a moment the question of treatment from the standpoint of statistics. The treatment by morphia presents the lowest

[1] ANNALS OF GYNÆCOLOGY AND PÆDIATRY, April, 1891:

[2] American Medical Association, Washington, 1891.

[3] ANNALS OF GYNÆCOLOGY AND PÆDIATRY, April, 1881.

[1] British Medical Journal, II, April, 1891.

mortality, 3.3 per cent. (Veit). If we look into this more closely, however, we find that Veit obtains his statistics from over sixty cases, without giving the exact figures. The highest mortality, according to Hirst, is found in cases treated in this country, ranging at about 40 per cent. He presents a table, based upon the records of nine maternity hospitals, showing a mortality of 38.4 per cent. in seventy-eight cases. This is fallacious in one respect, namely, in that the cases which are treated in such institutions are frequently emergency cases, where the treatment is instituted too late. During the past year, at the Philadelphia Lying-in Charity, two cases of eclampsia were treated; both of these were admitted to the hospital in a condition of extreme danger, and after the greatest neglect. One case died, which shows at once a mortality of 50 per cent. In addition to this, the want of care in recording cases in this country—even in the most exact institutions—has much to do with the indifferent results. Galabin[1] states that "In the Guy's Charity, during venesection days, the mortality in fifty cases of puerperal eclampsia was 30 per cent.; since venesection had been discontinued, the mortality in thirty-four cases had been only 20.5 per cent" ("Year Book of Treatment," 1891). These statistics are also defective. It is easy to imagine that in the thirty-four cases, where the mortality was reduced to 20.5 per cent., the number of cases suitable for bleeding may have been small. If the writer had selected fifty cases in which venesection was practiced, and thirty-four cases where it was not, the indications for treatment being, generally speaking, the same in both sets of cases, his figures would have had more weight. If, again, by further observation, he had completed his second set of cases to equal the first, by adding the record of the next sixteen cases treated in Guy's Charity—venesection being withheld—it is highly probable that some cases suitable for this treatment would be encountered, and the mortality be greatly increased.

Winckel speaks of the possibility of reducing the mortality to from 7 to 10 per cent. by the treatment now in vogue in Germany, whereas Löhlein[1] "searching the records of various hospitals has collected 325 cases of puerperal eclampsia out of 52,328 labors. Out of these 325 cases sixty-three died from convulsions, and fourteen from other causes. The mortality was thus 19.38 per cent." ("Year Book of Treatment," 1891).

The points which I desire to make in favor of the use of morphia, based upon the history of the cases which I have presented, upon the testimony of those who advocate its use, and upon the criticism of the statistics just under consideration, are the following:

First, the efficiency of morphia in those cases where the life of the patient is threatened by the severity and rapid recurrence of the convulsions.

Second, the absence of deleterious effects upon the process of elimination, especially in those cases where the kidneys are acutely affected incidentally to the eclamptic state.

[1] British Medical Journal, September, 1891.

[1] Central, f. Gynækologie, June, 1891.