COMPARISON OF THE RESULTS OBTAINED AFTER RADICAL AND CONSERVATIVE TREATMENT OF ECLAMPSIA IN THE OBSTETRICAL DEPARTMENT OF THE JOHNS HOPKINS HOSPITAL

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UNTIL the exact etiology of eclampsia is known, the treatment of patients suffering from it must necessarily be more or less empirical. The methods proposed for the treatment of this disease can be divided into one of two main groups: (1) Procedures in which immediately delivery of the woman is the object to be attained, and (2), those which aim rather at the control of the convulsions, delivery being a secondary consideration. In the latter group methods of treatment are encountered which would appear to be diametrically opposed; (compare for example the method of Stroganoff with the "Dublin" method), yet the advocates of each claim equally good results.

While in certain quarters the immediate termination of pregnancy, by radical surgical procedures if necessary, is still advocated; on the whole the tendency at present tends to follow more conservative lines.

Since the opening of the Obstetrical Clinic of the Johns Hopkins Hospital in 1894, to July, 1924, two hundred and forty-seven cases of eclampsia have been treated in the service, which may be readily divided into two groups, according to the lines of treatment followed. The first series includes those treated in the clinic from its opening until the year 1912, and comprises one hundred and ten cases. Of these sixty-one were of the antepartum, twenty-four of the intrapartum, and twenty-five of the postpartum varieties. In this series there were twenty-five maternal deaths, as follows: fifteen in the antepartum cases, six in the intrapartum cases and four deaths in the postpartum cases; a mortality of 24.6, 25 and 16 per cent respectively; while the gross maternal mortality for this series was 22.7 per cent.

In the treatment of the ante- and intrapartum cases in this series, the prime object in view was immediate delivery, following which other procedures such as sweating, purging, venesection, administration of sedatives, and administration of large amounts of fluid were made use of according to the condition of the patient. Immediate delivery, however, was the first consideration, the choice of procedure depending largely on the condition of the cervix. In the antepartum cases particularly, this involves the performance of numerous major obstetrical operations. In the earlier years, accouchement forcé with

instrumental and manual dilatation of the cervix followed by high forceps or version was the procedure usually employed. Later, the vaginal hysterotomy of Dührssen was employed extensively, and abdominal cesarean section to some extent. Some idea of the consistency of our procedure may be gained from the fact that only two of the 85 patients in this series presenting ante- and intrapartum eclampsia were delivered spontaneously.

Table I shows the division of the cases and the results obtained in the first series.

TABLE I

FIRST SERIES

	NO. OF CASES	MATERNAL DEATHS	PER CENT	
Antepartum	61	15	24.6	21 deaths or 24.8 per cent
Intrapartum	24	6	25	
Postpartum	25	4	16	
Total	110	25	22.7	

The treatment followed in this series of cases was in general similar to that employed in most clinics at that period, and the end-results here, as well as elsewhere, left much to be desired.

In 1912 Lichtenstein reported a series of four hundred cases of eclampsia treated in Zweifel's Clinic, showing a gross maternal mortality of 18.5 per cent and in which the mortality of the antepartum, intrapartum and postpartum cases was 28.57 per cent, 12.6 per cent and 27.14 per cent respectively.

In the majority of the cases of ante- and intrapartum eclampsia, operative delivery of some type was carried out after a varying number of convulsions. On analyzing the results obtained, Lichtenstein found that in general the patients who did well were those who had lost considerable blood at the time of delivery, and he therefore argued that any benefit derived from operative delivery was in all probability dependent upon the loss of blood. Again, inasmuch as the mortality in the postpartum variety was 27.14 per cent, he very plausibly inquires why these results should be so poor if early delivery has any favorable effect on the prognosis, as in these cases one has the earliest possible delivery; that is before the outbreak of the attack. He was inclined to attribute such results as being due to the fact that the majority of the women had been delivered spontaneously and consequently had lost but a minimal amount of blood. Consequently, he concluded that equally good, or better, results should follow venesection without the addition of any serious operative procedure, and prompt improvement was noted in Zweifel's Clinic following the introduction of more conservative treatment.

Lichtenstein's arguments appeared so convincing, and our own re-

sults up to this time had been so unsatisfactory that it was decided to abandon the radical treatment of the ante- and intrapartum cases, and in future to rely upon more conservative procedures, more particularly free venesection.

Since 1912, one hundred and thirty-seven cases of eclampsia have been treated in the clinic along more conservative lines with a most pronounced improvement in the maternal results as shown in Table II. In other words, the gross maternal mortality has been reduced one-half.

TABLE II

SECOND SERIES

	NO. OF CASES	MATERNAL DEATHS	PER CENT	
Antepartum	71	9	12.6	14 deaths or 12.8 per cent
Intrapartum	38	5	13.1	
Postpartum	28	5	17.8	
Total	137	19	13.8	

During this time numerous changes have been made in the treatment followed, particularly in the transition period following the change from active and radical to conservative treatment. Operative procedures aiming at delivery were not suddenly abandoned but have become less and less frequent, so that at the present time we feel that anything in the way of a major operation is seldom indicated except in the presence of actual dystocia.

Whereas in the first series only two of the eighty-five patients suffering from ante- or intrapartum eclampsia were delivered spontaneously, in the second series, spontaneous labor occurred in forty-seven cases or 43.1 per cent, while operative interference was limited almost entirely to low forceps or version and extraction after spontaneous dilatation of the cervix had occurred. Moreover, the types of operative procedure employed vary markedly in the two series, and while accouchement forcé, vaginal hysterotomy or cesarean section was employed in 79 per cent of the cases in the first series, only sixteen or 14.6 per cent of the patients in the second series were subjected to such procedures, and in the past seven years only two major operations were performed on eclamptic patients, one being a cesarean section on account of a generally contracted pelvis.

In the curative treatment of the patients in the second series, free venesection has been the most important feature. The amount of blood withdrawn has varied, according to the reaction of the patient. Most of the patients withstand the withdrawal of considerable quantities of blood without showing any alarming symptoms. While in general 500 to 700 c.c. of blood have been withdrawn, we have not hesitated to take as much as 1000 c.c. if the patient reacted well. On the other

hand, occasionally we have been obliged to discontinue the procedure after withdrawing as little as 200 to 300 c.c.

Morphia, either alone, according to the method advocated by McPherson, or morphia combined with venesection has also been made use of to a considerable extent.

As a result of our experience during the past twelve years we have become more and more conservative, and for the past two years patients suffering from ante- or intrapartum eclampsia have been subjected to the following regime:

1. They are placed in a quiet, darkened room and are disturbed as little as possible.

2. A hypodermic injection of ¼ gr. of morphia is given at once. This may be repeated if indicated (particularly in the presence of undue restlessness or repeated convulsions) but not more than one-half grain is given in the first twenty-four hours.

3. The patient is kept turned on one side with the foot of the bed elevated as long as coma persists. Mucus is swabbed from the pharynx as it collects.

4. Venesection after the second convulsion performed under nitrous oxide anesthesia if necessary. One thousand c.c. of blood are withdrawn unless the systolic blood pressure falls below 100 mm. or the pulse rate shows alarming change during the process. (This is of course contraindicated in the presence of marked anemia.)

5. Water is given freely, as desired, when conscious. Those who cannot drink, on account of coma, are given 500 c.c. of 5 per cent glucose solution intravenously, which may be repeated in twelve hours.

6. A special nurse is in constant attendance until the patient is permanently out of coma.

7. No attempt is made at delivery until the cervix is fully dilated, unless some definite maternal indication apart from the eclamptic condition is present.

The treatment of postpartum eclampsia is identical with the above, except that the amount of blood withdrawn at venesection should represent the difference between the amount of blood lost at the time of labor and 1000 c.c.

At the British Congress of Obstetrics and Gynecology of 1922, Thomas Watts Eden suggested that the results of treatment varied greatly according to the severity of the disease and laid down the following criteria for differentiating between the mild and severe cases: (a) Persistent coma. (b) A pulse rate over 120. (c) A temperature above 103° F. (d) Convulsions numbering more than ten. (e) A urine which solidifies on boiling. (f) Absence of edema.

If any two or more of the above symptoms are present the case is

classified as severe; and as mild when none or only one of them is present.

Analysis of our two series of cases upon this basis shows a number of points of considerable interest, particularly from the standpoint of therapy.

In the following tabulations patients with chronic renal disease attended by uremic convulsions have been excluded as far as possible. Also, as the amount of albumin has been determined quantitatively in all our patients, I have chosen the figure of 10 grams per liter instead of (e) above.

Tables III, IV and V, show the results obtained in our mild and severe cases in each variety of eclampsia.

TABLE III

ANTEPARTUM ECLAMPSIA

	MILD CASES	DEATHS	PER CENT	SEVERE CASES	DEATHS	PER CENT
First series	33	5	15.1	28	10	35.7
Second series	23	0	0	48	9	18.7

TABLE IV

INTRAPARTUM ECLAMPSIA

	MILD CASES	DEATHS	PER CENT	SEVERE CASES	DEATHS	PER CENT
First series	16	2	12.5	8	4	50
Second series	19	1	5.2	19	4	21

TABLE V

POSTPARTUM ECLAMPSIA

	MILD CASES	DEATHS	PER CENT	SEVERE CASES	DEATHS	PER CENT
First series	15	0	0	10	4	40.
Second series	16	0	0	12	5	41.6

Or if we tabulate the gross figures for the three types of eclampsia occurring in the second series:

TABLE VI

SECOND SERIES

	NO. OF CASES	MATERNAL DEATHS	PER CENT	
Antepartum	71	9	12.6	14 deaths or 12.8 per cent
Intrapartum	38	5	13.1	
Postpartum	28	5	17.8	
	137	19	13.8	

A perusal of these tables at once reveals the fact that a striking improvement has been brought about in the results obtained in ante-

or intrapartum eclampsia when the two series of cases are compared. I can say very little in regard to the postpartum variety, as the results in the two series are practically identical, and the line of treatment employed in the two series was similar. It would seem that where postpartum eclampsia is of a mild type, the end-results are in general satisfactory, whereas, if it be of the severe type it is an even more serious complication than the severe form of the disease occurring prior to delivery.

If we now compare more fully the end-results obtained in the ante- and intrapartum cases in the two series, we shall see how marked the improvement has been.

TABLE VII

ANTE- AND INTRAPARTUM ECLAMPSIA

	MILD CASES	DEATHS	PER CENT	SEVERE CASES	DEATHS	PER CENT
First series	49	7	14.2	36	14	38.8
Second series	42	1	2.3	67	13	19.4

From the above figures it is seen that under conservative treatment maternal mortality in the mild cases has been reduced from 14.2 per cent to 2.3 per cent, while that of the severe cases has undergone a reduction of 50 per cent.

Notwithstanding this striking diminution in mortality, it should be noted that in the second series of cases five of the women died undelivered. Even when this is considered, the only conclusion that can be drawn from the results is that radical operative treatment not only does no good so far as influencing the disease is concerned, but actually does considerable harm. Further evidence in confirmation of this is afforded by considering the high mortality in the severe postpartum cases, and yet in them delivery had occurred before the onset of the eclamptic seizures.

Furthermore, the cases of so-called intercurrent eclampsia are also of interest in this respect. In twelve women in our second series of antepartum eclampsia, the disease yielded to conservative treatment, yet delivery did not occur until from one till twenty-two days after the cessation of convulsions. That such recovery prior to delivery does not necessarily depend upon the death of the child is evidenced by the fact that five of the twelve women gave birth to living children.

From the maternal standpoint then, our results indicate clearly that immediate delivery of the eclamptic woman by a radical operative procedure is unnecessary in the mild and inadvisable in the severe type of case, and that such treatment definitely increases the maternal mortality in both types of the disease.

The only remaining argument in favor of immediate delivery would be afforded by the fact that it leads to a marked improvement in the

fetal results. That, however, has not been our experience, and while conservative treatment does not improve the chances for the child, yet they are not materially diminished thereby. The fetal mortality will of course always be higher in the antepartum than in the intrapartum variety, as in many cases the child has not yet arrived at the period of viability.

TABLE VIII

FETAL MORTALITY

	FIRST SERIES			SECOND SERIES		
	CASES	FETAL DEATHS	PER CENT	CASES	FETAL DEATHS	PER CENT
Antepartum	61	40	65.5	71	49	69.0
Intrapartum	24	9	37.5	38	15	39.4
Total	85	49	57.6	109	64	58.7

(The above figures for fetal mortality include all stillbirths and infants born alive but dying within the first two weeks, as well as the children of women who died undelivered.)

The severity of the disease distinctly influences the fetal mortality. In the two series combined, a gross fetal mortality of 77.6 per cent was noted in the severe antepartum as compared with 53.5 per cent in the mild cases; while the severe and mild intrapartum cases showed a gross fetal mortality of 51.4 per cent and 28.5 per cent respectively. As noted above, however, this was not appreciably affected one way or the other by the method of treatment.

From a study of these two series of cases treated along totally different lines we feel convinced that radical operative procedures should have no further place in the treatment of frank eclampsia, but that the last word in its treatment has not been spoken and obviously cannot be until the etiology of the disease is definitely established.

The treatment at present employed in the Johns Hopkins Hospital presents certain features of several well-known methods. It is to be regarded as purely tentative, and will be modified whenever increasing knowledge shall provide other therapeutic measures of greater promise.

In discussing end-results we agree with Eden that it is most important to distinguish between the mild and severe types of the disease; as the great majority of the former will recover with a minimal amount of treatment. For example, in our second series of cases there were nine patients who literally received nothing in the way of treatment, and yet were delivered spontaneously and made satisfactory recoveries. Had these patients been delivered by cesarean section, for example, barring surgical risks, the results would have been the same, and might well have been employed as a strong argument in favor of that procedure.

The end-results in the severe type of case still leave much to be desired, although those treated by conservative methods show a

marked improvement (50 per cent) over those treated by the radical method.

It might be well to discuss briefly a few of the procedures which have enjoyed a certain degree of popularity in the treatment of this disease, which as a result of our experience, we have either found useless or actually harmful.

Chloroform has been used extensively to control the convulsions. As a matter of practical fact it seldom can be administered in such a manner as to produce this effect, and its damaging effect on the liver is now well known.

The sweat bath also falls in the class of dangerous therapeutic agencies, and in the past a number of our patients so treated have shown alarming symptoms following its use We feel that any advantages which might attend its use are more than offset by the dangers inherent to its use. Patients should be kept warm, but this can be done more satisfactorily with blankets and hot water bottles.

Particularly in the case of markedly edematous patients, large amounts of fluid should not be forced, as was formerly done, as the processes of elimination are unable to cope with the fluid already present.

Of operative procedures, I would particularly mention casarean section. It is the physician who sees only a few cases of eclampsia who is particularly prone to employ it. Doubtless he may have perfectly satisfactory results in several successive cases, but in a large series of cases the end-results are poor.

Peterson reports a gross maternal mortality of 25.79 per cent, while in the series of cases reported at the British Congress of Obstetrics and Gynecology in 1922, there was a gross mortality of 23.8 per cent; or if only the severe cases are considered 43.2 per cent. These results are greatly inferior to those obtained under medical treatment. It is true that the fetal mortality is somewhat lower after abdominal section, but not enough so to justify the added risk to which the mother is subjected.

In our cases where cesarean section was employed, the fetal mortality was 40 per cent. Consequently, our feeling is that cesarean section in eclamptic women should be limited to those cases in which actual mechanical disproportion exists.

CONCLUSIONS

1. The end-results in the treatment of ante- and intrapartum eclampsia are twice as good under conservative as under radical treatment. Those cases do best which are subjected to a minimal amount of obstetric interference.

2. At the present time we feel that chief reliance is to be placed on free venesection combined with the use of morphia in moderate doses.

3. The performance of cesarean section as a routine procedure in the treatment of eclampsia is to be discouraged.

REFERENCES

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