

OBSERVATIONS ON THE USE OF CASTOR OIL, QUININE, AND PITUITARY EXTRACT IN THE INDUCTION OF LABOR

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THE value of castor oil, quinine and pituitary extract in the induction of labor has not received the proper recognition by obstetricians, notwithstanding the contributions of Watson^{1, 2} and others. Additional data will probably be welcome.

Regardless of propaganda for prenatal care and the great volume of matter written on the subject, sufficient stress has not been laid on the one safe method of combating and defeating many of the abnormalities found during the prenatal period and at term.

The probable reason induction of labor is rather reservedly used by obstetricians, and scarcely thought of by the general practitioner, is its formidableness when done with bags or bougies. The dangers of the bag and bougie are numerous. Intrauterine manipulation, early rupture of the membranes, dislodgment of the presenting vertex, the occasional concealing of hemorrhage, prolapse of the cord, maceration of the cervix and the jeopardizing of the patient in case cesarean section has to be resorted to, do not obtain when the induction is made with castor oil, quinine and pituitary extract.

Much of the advantage of prenatal care is lost when one allows the head of the fetus, by sheer growth, to reach a stage of marked disproportion with the pelvis of the mother who carries it, when induction will avoid this complication.

Women with histories of rapid or precipitate labors, or with thin, dilated cervixes at term, should not be allowed to suffer precipitate labor while on the way to the hospital. Nor should those with toxemia, progressive, in spite of treatment, be further endangered by delay. The woman at term who is suffering distress and discomfort due to pain, pressure, insomnia and nervous anxiety, should not be permitted to reach the stage of exhaustion because one wishes to let Nature take her course. Nor is it good obstetrics to allow a woman near term, whose membranes are ruptured, to go longer than twenty-four hours without inducing labor.

The following series of cases is analyzed and offered as additional corroborative evidence of the value of castor oil, quinine and pituitary extract in the induction of labor. This series is composed entirely of cases from my private practice, who had strict and active prenatal care and who were under close observation during the antenatal, natal and postnatal periods. This series also comprises all of the inductions done by me in the last five years. None have been omitted.

There are 91 cases in all, 52 primiparae, and 39 multiparae. Eighty-eight of the inductions were successful (96.7 per cent), in three it failed (3.3 per cent). The failures were all in primiparae.

INDICATIONS

In this series of 91 cases the indications are shown in Table I.

TABLE I

Postmaturity	30
Large baby*	16
Distress and discomfort*	8
Fear of precipitate*	4
Premature rupture of membranes*	8
Multiple fibroids*	1
Toxemia	11
Large baby at term	8
Premature rupture of membranes	3
Bilateral pyelitis	1
Chronic pulmonary tuberculosis	1
	91

*These cases were also postmature.

METHODS

The method used is a modification of the method described by Watson. I have overcome the main objectionable feature of the Watson method by reducing the dose of pituitary extract to three minims. This dose seems to be less harsh and I have never found it to raise the blood pressure more than five points. I have also attempted to concentrate the actions of the castor oil, quinine, and pituitary extract and the enema in such a way as to make their actions more or less simultaneous. I have also used a greater number of injections of pituitary extract before conceding failure. This modification I think has given a slightly higher percentage of successes. The method is as follows: In the hospital, the patient is given two ounces of castor oil and ten grains of quinine sulphate and exactly two hours afterward, a hot soapsuds enema is given and as the enema is about to be expelled, three minims of pituitary extract are given by hypodermic. This same dose of pituitary extract is repeated by hypodermic every thirty minutes until labor starts and *no longer*. From then on, the labor is conducted as though the onset had been normal. Failure is admitted and the procedure stopped if eight hours pass without labor being started or if there is absolutely no sign of any effect toward the induction or if the continual use of the hypodermic is too trying to the mother. In such cases, the procedure is stopped, the mother is given an hypnotic or sedative and after twenty-four or forty-eight hours, the induction is again started.

In only eight cases, because of urgency and with the cooperation of the mother, were more than twelve hypodermic injections of pituitary extract given. Nearly all of these inductions were made by my own special nurse, who remained with the patients during the induction and subsequent labor. This nurse has reached a high state of efficiency in the recording of the fetal heart, rectal examination and in noting the progress of the induction and the labor. There were some cases in which labor had apparently started but in which after an hour or two, the contractions had disappeared entirely. In these cases the injections of pituitary extract were started again in the routine manner.

FAILURES

In the entire 91 cases in this series, there were three failures; all in primiparae, 3.3 per cent. The cases in which the induction with castor oil, quinine and pituitary extract were unsuccessful are detailed below.

CASE 1.—The indication in this case was a large baby with the head floating, at term, in which I was unable to fit the head into the pelvis; and the routine was stopped after 14 injections of pituitary extract without regular contractions. Labor began normally forty-eight hours later and was followed by a normal delivery. The baby weighed 4390 grams, and there was no morbidity of mother or child.

CASE 2.—The indication was a large head that could not be fitted into the pelvis. After the second attempt at induction, the head fitted well into the pelvis. Labor commenced normally six days later and was terminated with a left lateral episiotomy and low forceps. The baby weighed 4200 grams, and there was no morbidity in mother or child.

CASE 3.—The indication was a severe recurrent bilateral pyelitis due to colon bacillus infection. This patient was in a very serious condition, but because of religious beliefs, induction was prohibited until the period of viability arrived. There were two failures with castor oil, quinine and pituitary extract, and then bagging was resorted to because of the urgency, and was successful. The baby weighed 2324 grams. There was postpartum morbidity of the mother in this case due to the pyelitis and the case is again considered under "morbidity."

MORBIDITY

There were four cases of morbidity (patients who had rises of temperature up to 100.4° on two different days). (4.4 per cent.)

CASE 1.—This patient had lost her first baby at birth because of toxemia. She had chronic nephritis and developed severe toxemia in the last month of pregnancy. Treatment for two weeks in the hospital did not control the toxemia, hence, labor was induced. The first effort at induction failed, but the second was successful, and she had a normal delivery. The baby was born in good condition and weighed 3370 grams. The patient developed a mild degree of phlebitis of the right leg and left the hospital in the sixth week with her baby; both in good condition.

CASE 2.—This woman had severe bilateral pyelitis from the fifth month of pregnancy and was in the hospital from that time until her baby was born. Because of religious beliefs induction was prohibited until the period of viability arrived.

There were two failures with castor oil, quinine and pituitary extract and the bag was resorted to because of urgency. The baby was delivered by low forceps and left lateral episiotomy. There was a recurrence of the pyelitis four days after the delivery but this very soon improved and the patient left the hospital in the fourth week in good condition. Baby weighed 2324 grams at birth and left the hospital with the mother; both in good condition.

CASE 3.—This patient was delivered normally except for a median episiotomy. She had a temperature on the fourth day of 101.6° and on the sixth day a temperature of 100.4° due to nonsuppurative mastitis.

CASE 4.—Labor was induced in this patient because of contracted pelvis. After a test of labor of many hours, a cesarean section was done because the head did not engage or could not be fitted in and definite disproportion existed. She suffered considerable primary shock. On the fifth day, after a chill, her temperature rose to 104°. On the sixth day there was another chill and a fever of 105°. At this time colon bacillus was found in a cultured, sterile collected specimen of urine. There seemed to be no other basis for the fever. Following treatment, she improved at once. She left the hospital in the third week with her baby, both in good condition.

In the total series of 91 cases, there was no morbidity of the babies which could be attributed to either the induction or the type of delivery and there were no maternal deaths or fetal deaths, either early or late.

SUCCESSSES

Sixty-two inductions were successful on the first attempt, twenty were successful on the second attempt and six required three attempts before success was obtained.

In 39 multiparae, all of which were successful, the average number of hypodermic injections of pituitary extract necessary was six and one-half; and in 52 primiparae, the average number of injections in the successful cases was six; and in the failures, ten and one-half. The multiparae averaged three and eight-tenths hours in labor, the longest labor being nine and one-half hours; the shortest being three-quarters of an hour. In 52 primiparae, the average hours of labor was nine and one-tenth. The longest labor was twenty-two and one-half hours; the shortest, two hours.

CONCLUSIONS

In this series of 91 cases in which induction of labor was successful in 96.7 per cent with castor oil, quinine and pituitary extract, there were no maternal deaths and no fetal deaths, either early or late.

There were eight cases in which there was early rupture of the membranes (after labor had commenced but before the cervix was dilated two fingers). This had no bad effect on the labors, and there was no morbidity. The longest labor in this group was eight and one-half hours in a primipara, and the shortest was one hour in a multipara.

There were two cesarean sections in the series; in both of which was a serious doubt as to whether or not the patients could deliver due

to disproportion and inability to fit the head into the pelvis. They were both primiparae and induced at term with the idea of giving them a test of labor. One was a woman of eighty-five pounds, with a just minor pelvis and hydramnios; after having been in hard labor for four hours, with the cervix dilated to four fingers, the head was still floating and could not be fitted into the pelvis. The other was a short, stocky woman with a funnel type pelvis; after several hours of real hard labor, the head had not engaged and could not be made to engage. The first made an uneventful recovery, and the second is detailed as Case 4, under the heading "morbidity."

The termination of labor in the entire number of cases was as follows: normal thirty-three; low and midforceps, fifty-one; version and breech extraction, five; cesarean section, two. The average weight of the babies was 3848 grams, the largest baby weighed 4734 grams and the smallest 1927. There were twenty-three babies that weighed over 3800 grams and three that weighed under 2200 grams. There were 92 babies in all, one mother having twins. There were 91 vertex presentations, one of these having been converted from a breech presentation before labor, and one breech presentation.

In two of the three failures, the head which before labor was floating, could not be fitted into the pelvis, and showed signs of disproportion, fitted well down into the pelvis during the attempted induction and removed the indication for the induction.

It appears advantageous to modify the method of Watson by giving only three minims of pituitary extract instead of $\frac{1}{2}$ to 1 c.c., and by giving the first dose of pituitary extract as the enema is being expelled, and furthermore, by continuing the attempt at induction over a longer time than he advises.

REFERENCES

- (1) *Watson, B. P.*: AM. JOUR. OBST. AND GYNEC., 1920, i, 70. (2) *Watson, B. P.*: AM. JOUR. OBST. AND GYNEC., 1922, iv, 603.

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