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A STUDY OF SCOPOLAMIN AND MORPHINE AMNESIA AS EMPLOYED AT LONG ISLAND COLLEGE HOSPITAL.*

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BEFORE taking up the consideration of the application of scopolamin and morphine amnesia in abnormal obstetrics there are certain questions which the obstetrician must answer to the satisfaction of the profession.

First: Is twilight sleep, as it is called, a reality or a fad?

Second: Has scopolamin amnesia actually a place in rational obstetrics?

Third: What advantages can be gained for the patient by its use?

Fourth: Is the child really subjected to a greater danger when this adjunct to labor is employed?

Fifth: Is its employment feasible in abnormal cases and what are its limitations and contraindications?

Experience has shown us that it is possible to produce a satisfactory *Dämmerschlaf*, as it is called by the Freiburg School, in 85 to 90 per cent. of the cases subjected to this treatment. Dämmerschlaf is the application of partial narcosis to labor by the administration of morphine and scopolamin. The narcosis is so light as to eliminate only the memory of subjective pain, without interfering with the uterine contractions. The patient should have no recollection of the sequence of occurrences and wakes hours afterward

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refreshed, with the mind a blank as to the events through which she has passed. This satisfactory effect can only be produced by individualizing patients, using the minimum dosage, and in the proper surroundings. The environment and type of women has much to do with the success or failure of "twilight." The intelligent, highly strung, nervous woman is the best subject.

The exceptional results of Gauss have been obtained (1) by individualizing the patient and so minimizing the dose of the drugs employed; (2) by giving each woman the full test of labor without reducing her physical strength by subjecting her to the nerve-racking pain of prolonged labor; (3) by limiting the number of vaginal examinations, following the course of labor by abdominal and rectal palpation; hence all operative procedures were done in dilated passages and trauma to the soft parts and infection were reduced to a minimum.

It should be distinctly understood that the conduct of labor under scopolamin demands a fundamental knowledge of obstetrics and the obstetric art, as well as the ability to recognize and meet complications as they arise. Its employment has the *same relation to the first stage of labor* as the administration of chloroform or ether to the perineal stage. When intelligently employed it is a useful adjunct to the woman's comfort. Its employment is making us all more careful and competent obstetricians; we are observing more critically, and the condition of the child is receiving greater consideration.

We have, through the courtesy of my associate, Dr. Ralph M. Beach, been permitted to study the end results from the records of nearly 1300 cases in America, the data of which he has compiled, and compared with a similar series of cases in which twilight was not employed. These tables are convincing in that they prove that Dämmerschlaf is a reality, not a fad.

The advantages of painless labor to the woman are: that it permits us to give each woman the full test of labor without reducing her physical strength by subjecting her to the nerve-racking pain of a prolonged first stage, with less nervous shock, less muscular effort, and easier and more prompt dilatation than can be obtained without its use. This ensures better preparation of the soft parts, with diminished trauma, less liability to intervention, and consequently less sepsis.

It cannot be denied that suffering exhausts more than physical effort. Anyone who has seen one of these women a few hours after a twenty-four- or thirty-hour labor under "twilight" cannot fail to be impressed with the absence of all evidences of exhaustion. Neither

can it be denied that our present-day women are poor obstetric risks. Modern civilization has left a definite impression upon the physiological functions of our women. The character of their labors has been changed. Primary inertia is not uncommon before complete dilatation of the cervix is obtained. Excluding hard part obstruction and inflammatory changes in the cervix, nervous exhaustion is the most potent cause for this inertia. After labor is once established Dämmerschlaf eases the pain, relieves the restlessness, but does not interfere with the efficiency of the uterine contractions, and so expedites dilatation. Soft part injuries are minimized, and we feel that the greater care and watchfulness given these women during their confinements actually makes their labors safer. We have educated the public how to prevent disease; they are going to educate us how to prevent the disasters of childbirth by insisting on better prenatal and interpartem care. Even now they insist on routine antepartem examinations of the pelvis, of the urine, of the blood pressure, and mensuration of the fetus.

Painless labor by partial narcosis with scopolamin and morphine is therefore an assured fact, and when used properly in selected cases where the pelvic relations are normal, or approximately normal, permits nature to take time to prepare the cervix, the vagina, and the vulvovaginal orifice for the passage of the fetus without producing physical or muscular fatigue or effort in the mother. This has been shown in our experience at the Long Island College Hospital, and in that of my associates Drs. Beach and Holden, by the diminution in the number of lacerations produced as well as in the reduction of the number of forceps operations performed in primiparæ. Our observations prove that scopolamin and morphine actually shorten the first stage of a primiparous labor by more promptly overcoming the soft part obstruction. This is not so, however, with the second stage, which may be prolonged beyond safe limits if too much morphine has been used or if the operator has attempted to induce twilight sleep too late in labor.

Scopolamin-morphine amnesia is not without danger; neither is the production of narcosis with ether free from accident or complication. Yet in the proper hands these dangers are and can be minimized. Certain women take ether poorly; so certain women are poor subjects for the induction of twilight sleep. Our experience has shown us that where it is difficult to produce amnesia that it is safer to discontinue the use of the drugs. Probably further experience will indicate to us where the difficulty lies. Failures may be averted, to a large extent, by intelligent administration, careful

observation of the fetal pulse rate, individualization of the patient, minimum dosage, proper surroundings, and the free exhibition of water throughout the narcosis.

It is claimed by the critics of this method that the child is apt to be asphyxiated and narcotized. This is not the fault of the method, but the fault of the dosage, and of the individual using it. The child does participate in the twilight sleep to some extent and may suffer from oligopnea for several minutes, and it is common for the cry to be delayed for a minute or two after birth, though the fetal heart may show no disturbance in either rate or rhythm. *Cyanosis*, however, *is the exception, unless the dosage has been too large*, or *given at too frequent intervals*, or *too late in the labor*, or *the second stage has been allowed to continue too long*. We can see no reason why, because scopolamin has been given, that the ordinary obstetric rules as to the management of the second stage should be disregarded. Yet this has been the fact in many of the reported cases. The child, after stretching itself as if awakening from a restful sleep, cries as lustily as the ordinary new-born infant, if the method has been employed with the same intelligence that would be given to the use of an anesthetic in the second stage of labor. Our experience convinces us that the induction of twilight sleep is distinctly a first-stage procedure and should not be begun if the labor is too far advanced. Our own experience as well as the collected statistics of Dr. Beach show that the actual fetal mortality is lessened by the employment of this form of anesthesia.

Contrary to the popular idea of twilight sleep which is advanced by those women who have had successful deliveries here and abroad under its influence, we wish to impress upon you that its employment has distinct limitations in abnormal cases, and must be used with judgment in all. It is particularly indicated in nervous women of the physically unfit type in their first labor, for it is in this type of women in ordinary practice that labor has most often to be terminated artificially, owing to the physical exhaustion so common at the end of the first stage, before cervical dilation is complete, or in the second stage when no more muscular force can be brought upon the uterus by the undeveloped abdominal muscles. The usual obstetric interference by forceps in unprepared soft parts results in a permanent morbidity, and is the largest contributor to our collection of chronic invalids. It is in just this class, the physically unfit, that scopolamin will give the best results, for by its use we are able to obtain full dilatation of the cervix by operation of the normal physiological factors, namely, the bag of waters and the force of the

uterine contractions before the patient begins to show signs of physical tire. In dry labors the exquisite pain which is produced by pressure of the presenting part on the congested, sensitive cervix is relieved by the administration of scopolamin and morphine, and the cervical ring is relaxed. Consequently the presenting part is driven through the pelvis and later into the vagina, and low forceps in dilated passages is the most serious intervention to which the woman is subjected. This statement is proven by the marked diminution in the number of high and medium forceps instituted when twilight sleep has been used.

Border-line disproportions also offer another indication for its use, for all primiparæ with border-line contractions should be given a test of labor before instituting operative measures. This means that the cervix must be dilated, the membranes ruptured, and the uterine contractions aided by a tight binder and proper posture, and the patient be given a chance to drive the presenting part into the pelvis. This all takes time and effective labor pains, and these patients are in need of rest between contractions, because having pain is work, and work exhausts. Under scopolamin amnesia and analgesia this same woman may be carried for hours without showing any of the classical signs of exhaustion, in the character of the pulse and its rate, or in the character of the labor pains, and if operative delivery is indicated, either in the interests of the mother or child it may be accomplished with less shock and with less general anesthesia.

The conduct of labor in cardiac cases is favorably influenced by the administration of twilight. Apprehension, restlessness and physical pain are all ameliorated by the scopolamin, hence the strain of labor, which plays such havoc in hearts which are decompensated, may be greatly reduced by carrying the woman through the first stage of labor under twilight. In our service at the Long Island College Hospital we have employed morphine and scopolamin as a routine in our cardiac cases, whether compensated or decompensated, and by this plan have fortified the women's resources and obtained full dilatation of the cervix without putting strain upon the heart. The same may be said upon the conduct of labor in the presence of tuberculosis where the first stage may be successfully carried through under twilight.

The contraindications to its use are the emergency conditions which arise in obstetric practice, as: precipitate labor, placenta previa, accidental hemorrhage, eclampsia, prolapse of the cord, primary inertia, and a dead fetus. On the other hand, it may be

used as a first-stage procedure to secure dilatation in malpositions, when such malposition is recognized, as it has been shown that the proper employment of scopolamin favors dilatation of the cervix and diminishes the spasticity of the uterus.

Two methods of administration have been introduced into this country, that of Siegel, who uses the drugs according to a definite schedule of doses, a method employed in third-class patients in Freiburg with fair results, and that of Gauss, who individualizes the patient, grading the doses by the condition of amnesia obtained. In this plan, a single dose of morphine hydrochloride is given instead of repeated doses. Until we adopted the latter method, many of our babies showed some cyanosis.

The drugs as used at Freiburg come in ampoules, each containing 1 c.c. of the solution, the strength of which is as follows: Each ampoule contains respectively scopolamin hydrobromide (Straub) 0.0003 gram (gr. 1/200), solution of narkophin, 0.03 gram. According to the Siegel method, they are administered as follows: When the labor is definitely established, 1½ ampoules of each drug is given hypodermically as the initial dose; forty-five minutes later, 1 ampoule of scopolamin is administered alone; while one hour later, ½ ampoule of each is given. The amnesia is maintained by repeating the scopolamin alone in ½-ampoule doses every two hours. It is seldom necessary to repeat the morphine solution, though it may be used every third time, at six-hour intervals, in a long labor. It is the morphine which has the effect on the child.

In the Gauss method an initial dose of morphine hydrochloride, gr. ⅛ to ⅙, with scopolamin hydrobromide (Straub) 0.0003 is used; the morphine is not repeated, but the scopolamin in doses of 0.0003 or 0.00015 gram is given at one-, two-, or four-hour intervals, depending on the degree of amnesia and the clinical picture presented by the patient. Each woman is individualized and carried along with the minimum dose. Smaller doses are required when the sleep is induced early in labor, larger doses when the first stage is well advanced before the initial dose is administered. It is in the latter class that there is most danger to the child, as the child gets the full effect of the drug.

In my personal experience and that of my associates, Drs. Ralph M. Beach and F. C. Holden, at the Long Island College, Jewish and the Methodist Hospitals in Brooklyn, 155 cases in all, there have been but three failures. One hundred and fifty had no recollection of their labor after the second injection, a few have had islands of memory, 10 per cent. have shown some delirium, during the perineal

stage. There has been no fetal mortality. Hence, we must conclude that scopolamin-morphine anesthesia can be used without detriment to either mother or child in properly selected cases. There have been nine low forceps operations in this series, a low average considering that the majority of patients were primipara. So by its use we have diminished the number of operative deliveries and so lessened the amount of obstetric trauma. There has been no case of postpartum hemorrhage, hence we can say that the frequency of postpartum hemorrhage has not been increased, by the use of this method and that the women in whom it has been employed have been in better physical condition, especially after prolonged labor than the same class of patients under ordinary labor. Our observations also show that the milk supply has not been affected.

We are further impressed, as our experience increases, with the wide field of usefulness of scopolamin anesthesia in hospital obstetrics. We feel, however, that for the present, at least, it is a method for the expert in a maternity hospital, and that its greatest usefulness is as a first-stage procedure.

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