

## REDUCTION OF FETAL MORTALITY

IN AN OBSTETRIC SERVICE\*

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**A**N unusually large percentage of fetal deaths in the obstetric service at the Louisville City Hospital during the year 1929 prompted us to make use of every available measure to have a better result in the following year.

We lost 142 babies in 1263 deliveries. Through proper deductions, absolutely nonviable babies, untreated syphilitics, toxemias of the mother and congenital anomalies, 82 could be eliminated, leaving 60 fetal deaths, a percentage of about 4.5, which will after all compare favorably with reports from similar institutions.

In order to reduce fetal mortality and especially to prevent stillbirths, every morbid condition in the mother must be detected and treated during her pregnancy.

An early examination in pregnancy should lead to the recognition of uterine displacements and by the use of a supporting pessary until after the fourth month, abortions on that account should be preventable.

Little beyond the recognized procedures can be done in saving the generally premature fetus in placenta previa and ablatio placenta as the loss of blood on the part of the mother is an additional factor in causing fetal mortality.

It should now be recognized that both conditions are absolute hospital procedures, which except in multiparae with well dilated cervixes, demand cesarean section.

If the fetus is not too premature and in good condition it should have the benefit of a cesarean delivery rather than the certainty of absolute destruction when its body is used in the vaginal delivery as a tampon in order to assure a safe delivery

for the mother. This is especially advocated in central and partial placenta previas as the operation renders the delivery safer for the mother as well.

If the vaginal route is selected in placenta previa and practically in the delivery of all premature babies, especially in primiparae, the principal cause of fetal death, cerebral injury, and intracranial hemorrhage, can be averted to some extent by the use of dilating bags to efface the cervix and of an episiotomy to remove the hazard of a tense perineum.

The present therapy of hyperemesis leaves but little to be desired in that direction and interruption of pregnancy with consequent fetal death should now occur very rarely.

At times, however, over-confidence in our therapy is rudely shaken, when a patient who has ceased vomiting and is taking an abundance of food presents sudden signs of collapse. We still have no reliable means of recognizing such extremely toxic cases. Very early interruption of the pregnancy might save them, but we have no criteria upon which to base the indication of the time for such a radical procedure.

Our therapy has been simplified considerably by the use of the Soresi blood transfusion apparatus and a thermos bottle outfit for the intravenous administration of glucose at a constant temperature and rate.

With proper prenatal care, the incidence of eclampsia can almost be eliminated.

It must not be forgotten, however, that with all our precautions, an indiscretion in diet on the part of a patient may precipitate

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an attack. In practically all of our eclampsias we get the history of some dietary indiscretion. Pork chops, hot tamales, hot dogs, raw oysters, bacon and greens, hot lobsters figure in such recitals and although it is not claimed that such indiscretions are the cause of eclampsia, they certainly precipitate an attack in apparently healthy gravida.

It is claimed that in such instances digestion is interfered with, fermentation of the food products takes place and the toxins absorbed from the decomposed food with those already circulating in the system from the pregnancy, are sufficient to precipitate the eclampsia.

Especial stress accordingly should be put on dietary restrictions in the last months of pregnancy, to prevent eclampsia and fetal deaths on that account. Attention will also be necessary very soon to curb the excessive smoking and drinking of some of our young women, especially during the period of gestation.

In the late toxemias the placenta always shows extensive areas of white infarcts. These are practically inert areas in the placenta and if they are sufficiently extensive they interfere with fetal nourishment and may cause either fetal death or premature expulsion. Again, such devitalized areas are dead spaces in the placenta and the absorption of toxic products from such areas into the maternal circulation will result in fetal death.

This naturally brings up the question of delivery in toxemic patients. From the foregoing it is evident that even if the toxemia is apparently controlled in the mother, the life of the fetus is in jeopardy on account of the absorption of toxins generated by the infarcts of the placenta and the diminished functioning of the placenta due to such devitalized areas. It would seem, if the fetus is viable, that delivery should be instituted as soon as the mother is in a safe condition.

A great number of our fetal deaths were due to premature births in syphilitic women both treated and untreated. The fetal

mortality was of course much greater in the untreated cases. It is advocated by some that a Wassermann test be made in every case of pregnancy. That is hardly practical in all circumstances. What is of more importance, it seems to me, is to gather statistics as to the condition five, ten and fifteen years after the birth of a living child from such a treated syphilitic mother, to determine whether it is a mentally and physically useful member of society or whether by our therapeutic measures we are simply bringing into the world morons, habitual criminals and physically unfit human beings. It is well also to learn that even in women who have had intensive treatment for syphilis throughout the period of pregnancy, the baby apparently free from taint at birth may show extreme symptoms of neurosyphilis one or two years later, as happened in a private case of mine. In plants and animals every effort is now being made to improve the stock by weeding out the unfit. It seems to me that it will soon be necessary to apply the same principle to human procreation. Given a syphilitic mother or father or both, the product of such a conception is surely impaired from the onset and when its physical being is once established, intensive treatment of the mother may prolong the period of gestation and give a live baby but it surely cannot remove the taint of its original inheritance. Nature has wisely decreed that if such cases of conception are left alone that the expulsion of an immature or macerated fetus takes place generally between the sixth or seventh month and we may well question whether our therapy is an improvement upon such destiny.

The very construction of the syphilitic placenta is such as to preclude the possibility of a living infant. The syphilitic placenta is larger, heavier and paler than normal, both the size and weight being due to edematous infiltration. The individual villi are larger and closely packed. The pallor is due to the obliteration of many blood vessels by thrombosis, and there is a

perivascular fibrosis which in time obliterates the vessels by pressure and accounts for the thrombosis.

Under the microscope syphilitic villi appear abnormally large, opaque and irregular in shape with swollen ends. The almost complete obliteration of the intervillous space, due to the increase in size of the villi, the inflammatory reaction in the intima and media of the vessels of the villi, the cellularity of the stroma and the apparent invasion of the stroma by the syncytial layer are all characteristics of the syphilitic placenta. Consequently the death of the fetus in syphilis is not due to the effect of the disease upon its organs, but upon the destructive changes produced by the syphilitic infection upon the structure of the placenta. It may also be presumed, then, that intensive treatment of the syphilitic mother during her pregnancy largely expends its force in preventing these destructive changes in the placenta making it possible for the mother to carry her syphilitic infant to full gestation.

Denmark has set the world a remarkable example of the efficient handling of the syphilis problem and it will be well for other nations to follow its precepts.

In my opinion the proper course to pursue at present is to inform the husband and the wife, that untreated she will give birth to a premature living or dead syphilitic fetus. That if properly treated she may give birth to a living child that will probably have syphilis. This cannot possibly interfere with any religious principles and will place the responsibility where it belongs.

A considerable number of fetal deaths will always occur from complications of labor. In breech deliveries improper extraction and twisting may result in fractures of the spine, injuries to the cord and suprarenal glands, and cerebral hemorrhage, all due to haste or wrong technique. In consequence external cephalic version is advocated by many in breech presentations. That has not been the custom in our clinic. Rather, have we tried to perform

all steps in the delivery of such cases with gentleness and deliberation, taking plenty of time in bringing down the after-coming head, refraining from traction on the neck and aiding at once with the forceps if the after-coming head does not come down readily.

Forceps deliveries will account for many fetal mortalities. Premature infants should never be delivered with forceps as but slight compression of the soft head will initiate a cerebral hemorrhage. With the cervix properly dilated with a large Vorhees bag and an episiotomy when the head reaches the perineum, spontaneous delivery should be possible in all such cases. High forceps operations should be abolished. When the head will not descend into the pelvis with full dilatation then it is an indication of disproportion and it requires discrimination then to decide between a version and a cesarean section.

In middle and low forceps operations the safety of the procedure depends upon an accurate diagnosis of presentation and position, made by the location of the sutures and fontanelles and verified by the posterior ear. Then there should be a careful cephalic forceps application with extraction by careful, gentle traction in the proper direction, with release of the forceps blades between pains, to minimize cerebral injury.

In cases of contracted pelvis we have been over conservative and have lost a number of babies by conscientiously giving the mother a prolonged test of labor, when by an earlier cesarean section a living child might have been secured.

It is unfortunate that the real test of labor and the capacity of a given pelvis cannot be definitely determined until after full dilatation and rupture of the bag of waters and as is well known with each hour of such delay the prognosis for both mother and child is more unfavorable.

If we consider that in the best of circumstances the fetus, forced by nature through such abnormal passages, is subjected to the danger of more or less cerebral hemor-

rhage, it may justify us in prompter resort to abdominal delivery when pelvic measurements and high riding of the fetal presenting part indicate at least a difficult vaginal delivery.

Abnormalities of the umbilical cord will at times lead to disaster. The short cord will indicate its presence by delay and recession of the presenting part after each pain in the second stage of labor. It may lead to premature separation of the placenta and fetal death unless prompt measures are instituted to terminate such a situation. In prolapse of the cord the patient should at once be placed in the Trendelenburg position, over the rungs of a chair placed on the bed if the condition occurs in a private house. This generally removes the pressure of the presenting part upon the cord and circulation in its vessels is re-established. Further steps in the delivery can meanwhile be carefully planned.

Every now and then a baby is born which, after resuscitation seems to breathe with difficulty and presents signs of venous congestion, the so-called "blue baby." The general belief has been that this was due to delayed closure of the foramen ovale but now we learn that it may be caused by hyperplasia of the thymus gland. Apparently sudden engorgement of this gland may result from too vigorous attempts at resuscitation, especially bending and twisting the newborn baby to make it breathe, together with rough wiping of the throat to remove mucus. The actual cause of death in these blue babies can of course only be ascertained post mortem, and it will be well in the future for obstetricians to regard thymus engorgement as a cause for the calamity.

According to Henderson a great many infants are lost at birth and in the two weeks following from atelectasis. Examination of the lungs post mortem often shows areas of improper expansion. Accordingly it is advisable that all the older and cruder methods of resuscitating an asphyxiated infant, such as hot and cold dipping, spanking, slapping and swinging, be abol-

ished. In place of these, reliance should be placed on gentle mouth to mouth breathing and the inhalation of a mixture of 93 per cent oxygen and 7 per cent carbon dioxide, as it has been found that the carbon dioxide is the essential stimulant to respiration. This special mixture is available in the market together with an infant's inhalation apparatus with a gas bag and inflatable mask wherewith the administration is exceedingly simplified.

Henderson is so impressed with the value of this procedure at birth and in the early succeeding days, that like the Crede eye treatment, he claims that it should be made compulsory, that every child whether asphyxiated or not be given the benefit of such a treatment for ten minutes several times a day in the first week of its life.

Postnatal pneumonia will account for a large number of fetal deaths. In premature rupture of the bag of waters the baby is in danger from inspiration of infected liquor amnii, the colon bacillus being the most frequent factor. Infection may similarly occur when the head is born and the mouth rests in close proximity to the anus. It follows accordingly that no vaginal examinations should be made in cases with premature rupture of the bag of waters as the baby is in sufficient danger from the microorganisms that can naturally gain entrance to the uterus if the labor is prolonged without having additional germs implanted by the examining fingers. Furthermore, care should be taken to keep the perineum and the anus free from fecal matter at the expulsive stage of a delivery.

Every hospital should be provided with the oxygen carbohydrate apparatus for resuscitation of asphyxiated infants and for the treatment of atelectasis and pneumonia after birth. It may perhaps be unreasonable at present to expect every practitioner to carry such an apparatus with him in home deliveries. He should, however, always be prepared to give immediate assistance to the asphyxiated and narcotized baby. Nearly all physicians now use some form of analgesia in the

conduct of labor cases and in consequence a differentiation must be made between a narcotized and an asphyxiated baby. The narcotized baby as a general thing is blue and makes no effort to breathe. Fortunately in most of such cases respiration can be induced by the intravenous injection of an ampoule of alpha lobelin. The umbilical cord is the most convenient site for the injection in the baby. The injection should be given into the umbilical vein and the vein can best be recognized by the fact that its course is straighter than that of the umbilical arteries, furthermore the umbilical arteries pulsate. A varicosity of the vein on the outside of the umbilical cord is selected about 4 to 6 inches from the vulva and the alpha lobelin injected with an ordinary hypodermic syringe. This procedure with proper removal of the mucus from the throat, gentle mouth to mouth breathing and keeping the baby warm should prove efficient in most cases of asphyxia and narcosis in the home.

Finally there is the class of cases where the fetus can carry on an intra-uterine existence, with respiration, nutrition, excretion and circulation through the placenta and umbilical cord, but which is absolutely unfitted for postnatal existence on account of abnormalities in development. In such cases the fetal heart will have been heard throughout the delivery and yet an apparently deeply asphyxiated baby will be born, perhaps after an unusually easy labor, that does not respond to efforts at resuscitation. Three cases of that kind occurred in our experience. The one after an easy cesarean section showed an imperforate anus and upon postmortem examination, transposition of all the viscera. The left side of the diaphragm was absent with the heart and lungs crowded to the right and the stomach and small intestines pushed up to the clavicle. The second case was on the same order with the exception of the imperforate anus. The third had congenital cystic kidneys with atresia of the ureters. It follows that in all obscure fetal deaths in uncomplicated

deliveries the physician should demand a postmortem examination or at least the possibility of an abdominal inspection and if such an abnormal condition presents itself then it will be a full exoneration of the attending obstetrician in what would otherwise be a very annoying and disheartening occurrence.

In spite of especial care in the conduct of our cases at the Louisville City Hospital we have to report for the year from July 1930 to July 1931, 138 fetal deaths in 1471 deliveries. Of these fetal deaths only 42 were full term, 96 were premature with 38 non-viable. In addition 31 fetal deaths were due to syphilis.

Fifty per cent of the fetal deaths accordingly were beyond our control. Other public institutions of a similar character no doubt have about the same mortality.

Therefore, while we should make every effort to reduce fetal mortality, yet the profession should no longer subject itself to criticism by the medical and lay press from the constantly repeated statement that 200,000 or more babies are lost each year in childbirth and that we rank seventeenth among the nations on account of our obstetrical mortalities, without explaining that fully 50 per cent of the fetal deaths are due to premature, non-viable, syphilitic, and macerated, fetuses, and other unavoidable fatalities, including a large percentage of abortions, which no amount of obstetrical skill or attention can lessen or prevent.

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