Its prevention and how it relates to HIE

A baby who is born before 37 weeks gestation is considered premature (1). Roughly 1 in 8 babies in the U.S., and 15 million babies worldwide annually, are born prematurely (1, 2). Babies born premature have underdeveloped lungs, immune systems, digestive systems, and skin. They are at a much higher risk of experiencing short and long-term complications than those born at term (3). Among these complications, preemies (as they are often called) are far more prone to having brain bleeds (intracranial hemorrhages) and blood flow issues in the brain (4). These problems can lead to hypoxic-ischemic encephalopathy (HIE), cerebral palsy (CP), and other long-term disabilities. Premature birth is the largest cause of neonatal death worldwide (2).

One of the key ways that medical professionals can reduce the risk of hypoxic-ischemic encephalopathy (HIE) in their patients is by taking all appropriate actions to prevent a baby from being born prematurely. Doctors can help decrease the risk of a baby being born prematurely by monitoring the pregnancy very closely and taking steps to prevent the baby from being born early if they suspect prematurity is a possibility. There are several procedures that medical practitioners can do when there are indications that a woman may give birth prematurely, or if she has a history of preterm birth/other risk factors. These preventative measures can be found below.

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Cervical cerclage

One of the factors that can cause premature birth is cervical insufficiency (sometimes referred to as 'incompetent cervix'). The cervix is a narrow passage forming the lower end of the uterus. At the beginning of pregnancy, the cervix is long and closed. It remains this way until labor and delivery. In some pregnancies, the cervix begins to soften, shorten, or open up prematurely. This is called cervical insufficiency (5). This can allow the fetal membranes to go through the opening and break, which can trigger early onset of labor and premature birth or miscarriage. Cervical cerclage is a procedure in which a stitch is placed into the cervix to help keep it long and closed and to prevent premature birth. It is usually done between 14 and 16 weeks of pregnancy. Later in pregnancy, usually between 36 and 38 weeks, the stitch is removed so that the baby can be born. Cervical cerclage has been found to significantly reduce the risk of preterm birth (2). In cases when true cervical incompetence exists, cerclage has been found to be 85-90% effective (6). To learn more about cerclage and which women may require one, click here.

Progesterone

Progesterone is a naturally occurring hormone produced in the ovaries. Among other roles, progesterone thickens the uterine lining to help avert preterm delivery and protect a growing baby (1). Women with cervical issues, as well as those who have a prior history of preterm birth or preterm premature rupture of membranes (PPROM) are often given progesterone in order to prevent their babies from being born early. In studies of women with a history of preterm birth, progesterone has been shown to significantly reduce the risk of preterm birth

prior to 34 weeks, preterm birth prior to 37 weeks, need for assisted ventilation, necrotizing enterocolitis, admission into the NICU, and perinatal death (2). Because of such findings, The American College of Obstetricians and Gynecologists (ACOG) recommends that progesterone be offered to women with singleton pregnancies and prior spontaneous preterm birth due to premature rupture of membranes or spontaneous labor (2). Progesterone is given either as an injection or a vaginal suppository. To learn more about the uses for progesterone, click here.

Magnesium sulfate

Magnesium sulfate, an organic salt, has many medical applications. One major application is in the treatment of preterm labor. Magnesium sulfate works by slowing or inhibiting uterine contractions in order to delay preterm birth for several days or longer (7). The treatment is usually given to women less than 32 weeks pregnant with active preterm labor, premature rupture of membranes (PROM), or indicated premature birth within 24 hours (7). This delay of several days or longer allows the baby more time to develop and allows medical professionals the time they need to devise the best method of delivery.

Magnesium sulfate has also been proven to act as a neuroprotective agent, reducing the likelihood of cerebral palsy and other developmental disabilities (8). Doctors may use the time gained with magnesium sulfate to also administer prenatal steroids such as betamethasone, which serve as additional neuroprotectors and prepare the lungs for life outside the womb. To learn more about the use of magnesium sulfate, click here.

Closely monitoring pregnancies

It is critical that physicians closely monitor their patients for high-risk pregnancy conditions that can lead to preterm birth or HIE. Once a pregnancy has been identified as high-risk, doctors must provide more extensive prenatal care and testing. Having more information about the state of the pregnancy can help them determine which measures may be necessary to prevent preterm birth.

Minimizing harm in preterm babies

In some cases, it may be impossible to prevent preterm birth from occurring. However, there are still treatments that may help to minimize the risk of lasting damage to the baby. Two common options are antenatal steroids (betamethasone) and magnesium sulfate. Magnesium sulfate can be used to inhibit uterine contractions but is also used to protect the baby's brain and reduce the risk of cerebral palsy (CP) and other conditions (7).

Antenatal steroids (betamethasone)

One of the most important things a doctor can do if they suspect a baby will be born prematurely is to administer corticosteroids. According to the American College of Obstetricians and Gynecologists (ACOG), a single dose of antenatal corticosteroids, betamethasone, should be given to women — if they are 24-34 weeks pregnant — suspected of experiencing preterm labor within seven days (9). Treatment with antenatal steroids accelerates lung maturity, shortens preemie hospital stays, decreases instances of intraventricular hemorrhage, decreases inflammation rates, and provides many other benefits

Antenatal steroids can help the lungs develop faster, which decreases the risk of respiratory distress syndrome (RDS) (9). It can also decrease the risk of brain bleeds, white matter damage (periventricular leukomalacia, or PVL), and other complications. Related resources

- Preventing Hypoxic-Ischemic Encephalopathy (HIE)
- Intracranial Hemorrhages (Brain Bleeds) and Hypoxic-Ischemic Encephalopathy (HIE)
- Betamethasone
- Magnesium Sulfate for Neuroprotection

Sources

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