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Important facts about the prevention of premature delivery

Introduction:

Preterm labor presents with different symptoms and some times without symptoms at all. In the normal pregnancy, the cervix is a very important organ for the protection of the growing fetus (unborn). It possesses the fascinating quality of remaining tightly closed until the end of the pregnancy and during normal term labor the cervix all but vanishes and thus allows the baby to be born.

In the normal pregnancy, as the baby grows and the uterus stretches, the pressure on the cervix increases dramatically. The normal cervix has the ability to withstand such pressure and remain closed until the last 2-3 weeks of gestation. At such time, the cervix starts to get shorter and softer, and when its length approaches zero, dilatation begins. Partial dilatation may start before the onset of normal labor in the last 2-3 weeks prior to delivery. However, most of the times dilatation starts after the onset of normal labor. The cervix then goes on to a complete dilatation of approximately 10 cm (4 inches) in diameter and this is enough of an opening to allow most normal babies to descend into the pelvic canal and thus be born.

Preterm labor and premature delivery is a totally different situation. Here, the cervix starts changing (getting shorter) much earlier and at a time that neonatal survival is limited. If the neonate survives, the chance of prematurity related complications is very high. If the cervix fails before 24 weeks the pregnancy is lost most of the times because survival before 24 weeks is very low. Almost 60% of the neonates that survive between 23 and 24 weeks gestation suffer from severe prematurity related complications.

Prematurity can cause the following neonatal (newborn) complications:

- Lung immaturity and lung damage from excessive oxygen use during the early days of life. This is known as broncho-pulmonary dysplasia (BPD) and may last for years.
- Retinopathy of prematurity from excessive use of Oxygen. This is a condition where the baby's inner eye layer is damaged and the baby loses his sight (blindness).
- Intracranial / intra-ventricular hemorrhage. This condition leads to variable degrees of brain damage which in turn may cause neonatal death, cerebral palsy and some times severe learning disabilities and mental retardation.
- Increased risk for infant death. Many newborns that are born prematurely survive enough to go home alive and in a stable condition but they die in the first year of their life from the serious prematurity related complications.

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- Necrotizing enterocolitis. The baby's intestine is damaged from decreased blood supply when premature babies suffer from oxygen deprivation. This condition is treated with surgical removal of the damaged intestine. Depending on the degree of damage, the newborn may or may not survive. The neonates that survive may have life-long intestinal problems.
- Premature babies are vulnerable to infections due to the fact that their immune system is immature and unable to fight such infections. Most of these infections are treated successfully with the extensive use of antibiotics. However, many neonates succumb to such infections; those that survive may suffer brain damage.

With modern neonatal care many premature babies survive well and develop normally into productive and healthy adults. However, a significant number of premature babies are negatively affected by the above mentioned complications and although they may survive to reach adulthood, the quality of their lives is poor. It is well documented in the recent years that poor quality of intrauterine life as well as poor quality of early neonatal life are associated with adult diseases such as diabetes, obesity, hypertension (high blood pressure), cerebral-vascular accidents (strokes) and cardiovascular diseases (heart attacks).

It is of course clear that the care provided to these premature babies is extremely expensive. The average bill when a premature baby is discharged home is now approaching \$200,000.00 and rising. As the amount on the bill increases, so does the probability that the neonate will have chronic problems as noted above.

It becomes then obvious that having a premature baby is not a normal thing and certainly not a desirable one. Over the last 20-25 years we have realized that prematurity is preventable in most cases. The basic dictum that guides our management of patients at risk for premature delivery is the fact that cervical incompetence and preterm labor are part of the same continuum. The old school of thought dictated that incompetent cervix and preterm labor are mutually exclusive. This is a false conception that has been responsible for many lost babies and many more premature babies. We believe (based on clear and thoughtful scientific evidence) that cervical weakness and preterm labor are caused in most patients by the same factors that cause inflammation, namely, pro-inflammatory cytokines. This may be the result of infection (vaginal, cervical or intrauterine) or tissue damage (damage of the placenta, amniotic membranes and the intrauterine lining). In our experience infection is a very small portion of such cases (2-3% of all cases we have managed in the last 5 years according to our statistics). The majority is caused by placental damage and the fact that most if not all of the premature babies are also growth deficient supports this fact. For this reason, we have focused our attention on preventing placental damage in order to prevent prematurity as well as other placental related pregnancy complications.

We manage patients that are at the highest levels of risk for premature delivery. Specific groups of patients we manage are as follows:

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- Patients with history of infertility that conceived by means of IVF or ovulation inductions and intrauterine insemination (IUI). The prematurity rate of singleton pregnancies that conceived by artificial reproductive means (ART) is 35%. Needless to say that multiple gestations of such patients are at least twice as much at risk for preterm delivery.
- Patients with previous preterm delivery are at 50-60% risk for a new preterm birth.
- Patients with recurrent pregnancy losses in the second trimester with or without the use of cerclage (cervical stitch). These patients are at almost 100% risk to lose their next pregnancy.
- Patients with recurrent first trimester pregnancy loss are at risk for preterm delivery if they have a successful pregnancy that made it past the first trimester. Such patients may have a risk for premature delivery as high as 35% and they behave very similar to the patients with history of infertility in this matter.
- Patients with previous placental problems that led to a medically indicated premature delivery (abruption, placental thrombosis, etc.).
- Patients with history of chronic hypertension and/or pre-eclampsia. Such patients have a 30% risk for a similar outcome during the current pregnancy.

When we care for such patients as mentioned above, we manage their pregnancies according to the following protocols:

1. Protocol for the management of pregnancies conceived by artificial reproductive technologies (ART)
2. Protocol for the management of preterm labor
3. Protocol for the management of placental thrombosis/thrombophilia

The above protocols are used in various combinations according to the patient's condition and symptoms. These protocols embrace several powerful diagnostic and treatment modalities. The core of our protocols is based in the deployment of the latest and most sophisticated ultrasound equipment that allows us to diagnose, treat and monitor the progress of the treatment. When ultrasound is used according to the American Institute of Ultrasound in Medicine (AIUM) standards it is the safest diagnostic modality for fetal diagnosis. Our facility is an AIUM accredited facility. We use proprietary technology and secure private internet access lines. Our practice locations are linked in such a way that our doctors may view your baby and the placental development from everywhere that a fast internet access is present. This allows us to provide the same high quality of care remotely and at the practice location that is convenient to the patient.

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Clinical aspects of prematurity prevention

Patient symptoms and signs:

Many of the patients that develop premature cervical changes experience vague symptoms that may last for weeks and go unnoticed. Very few patients experience cervical changes without any symptoms. The latter group is most likely to experience incompetent cervix. However, even in this group most of the patients have some warning symptoms and signs that if noted may help prevent loss of pregnancy or premature birth.

The following symptoms have been described by patients who either lost their pregnancies in the early second trimester (between 13 and 24 weeks gestation) or delivered prematurely (between 24 weeks and 37 weeks gestation):

1. Pelvic pressure
2. A feeling of stretching and pulling in the pelvis
3. Low back pain (in the region of the tail-bone).
4. Pressure in the vagina
5. Excessive discharge (feeling wet in the vagina)
6. Having pelvic discomfort that they cannot define clearly
7. A feeling of menstrual cramping
8. Intermittent deep pelvic discomfort
9. Gas pains
10. Rectal pressure and constipation

The above mentioned symptoms are usually ignored by most patients and their obstetricians. This is detrimental and leads to pregnancy loss and /or premature delivery.

Diagnostic modalities:

The best modality is vaginal ultrasound. The above symptoms can only be considered normal after a cervical evaluation by means of vaginal ultrasound reveals a normal cervix in length and appearance. Vaginal ultrasound may disclose the presence of lower uterine segment contractility and/or “bulging” of the lower uterine segment. These findings represent the earliest signs of preterm labor and premature delivery.

Treatment modalities:

At Kofinas Perinatal, the following modalities are employed in the management of patients with signs of preterm labor:

1. Bed rest
2. Indomethacin as needed
3. Procardia as needed
4. Cerclage (cervical suturing) if the above treatments fail.

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The above treatment schemes may be adjusted according to the individual patient's needs and responses to treatment. We believe strongly based on our long experience in treating such patients that every patient is unique and requires customized management. One size does not fit all.

Significant Note regarding Magnesium Sulfate:

The standard of care by other perinatal services for the management of premature labor has been up to now the utilization of hospitalization for days to weeks at a time and intravenous Magnesium Sulfate administration. This is usually combined with Terbutaline pump and home uterine monitoring after discharge. Both treatments have failed miserably and the proof of that is that in the last 15-20 years prematurity has increased from 8% to 13%. This represents an increase of 60% in 15-20 years. This is a dismal record and this remains the standard of care employed by 99% of perinatal services in this country.

At Kofinas Perinatal we have changed our protocols over the last 8 years because valid and quality scientific evidence made it clear that Magnesium and Terbutaline are not only worthless but lethal to both mothers and babies. Magnesium has been shown to delay delivery for 24 but has never been shown to prevent prematurity which is the desirable and valuable outcome. Terbutaline has never been shown to inhibit labor and is not any better than placebo (sugar pill). In contrast, chronic administration of Terbutaline exaggerates uterine contractility and causes premature labor and delivery. Magnesium is a lethal medication if the therapeutic levels are exceeded. Overdose causes paralysis of the respiratory muscles and death by suffocation. To avoid such events, the medication is administered by infusion pump. Infusion pumps are electronic devices that remain unattended for several hours at a time and if they malfunction, can result to maternal death. Human error may also cause improper function of the pump that can lead to maternal overdose. In addition, premature neonates born with magnesium in their blood are up to 3 times more likely to die than similar age premature neonates that have not been exposed to magnesium. As many as 5,000 premature neonates die annually because of inappropriate magnesium usage. This is a crime against humanity committed in the name of "standard of care". A recent article in the most prestigious obstetrical journals called the use of Magnesium Sulfate for the management of premature labor "***shaky, poor science and worse ethics.***" {*Magnesium Sulfate Tocolysis: time to quit. D. A. Grimes, MD, and K. Nanda, MD, MHS 2006 108;4:986-9*}