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Research Update: Reducing Neonatal Respiratory Problems

A multicenter clinical trial led by researchers at Columbia University Medical Center and NewYork-Presbyterian has shown that the use of corticosteroids in mothers at risk for late preterm delivery significantly reduced the incidence of severe respiratory complications in their babies. “Our study demonstrates that administering a medication that is commonly used to prevent complications in babies born before 34 weeks of gestation can also reduce the risk of many serious complications in babies delivered just a few weeks before term,” says **Cynthia Gyamfi-Bannerman, MD, MSc**, a maternal-fetal medicine specialist and Co-Director of the Columbia University Preterm Prevention Center, and lead investigator of the study published in the April 2016 issue of *The New England Journal of Medicine*.

Since the early 1990s, corticosteroids have been widely used in mothers at risk of delivering before 34 weeks of gestation to accelerate the development of the baby’s lungs in order to better clear fetal lung fluid and absorb oxygen. At the time, researchers believed that corticosteroids were unnecessary for later preterm births because 99 percent of babies born after 34 to 35 weeks survive. However, it is now clear that infants born between 34 and 36 weeks have increased neonatal and childhood respiratory complications compared with newborns born at 37 weeks or later.



Dr. Cynthia Gyamfi-Bannerman

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Improving Patient Safety on an Obstetrics Unit

Over his 30-year career, **Amos Grunebaum, MD**, has cared for thousands of women with high-risk pregnancies. “Fortunately, over the last 50 to 100 years we’ve been able to significantly decrease maternal mortality in the United States, but labor and delivery, including Cesarean sections, still carry risks for any woman,” says Dr. Grunebaum, Director of Maternal-Fetal Medicine at NewYork-

Presbyterian/Weill Cornell Medical Center and a leading authority in maternal-fetal medicine.

Dr. Grunebaum has long been a staunch advocate for obstetric patient safety. Between 2003 and 2009, he and his colleagues in the Department of Obstetrics and Gynecology implemented a comprehensive obstetric patient safety program with integrated clinical, technological, and staff components with the goal of reducing sentinel events and adverse outcomes.

“A little more than a decade ago, NewYork-Presbyterian made significant changes to the way we provide care and the way we interact with our patients, moving toward an interdisciplinary team approach,” notes Dr. Grunebaum, who along with several of his colleagues became trainers to teach staff

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“It is possible to continually make childbirth safer. It requires extensive and considerate changes, physician and staff cooperation, constant vigilance, flexibility, and rapid adaptation based on new experiences.”

— Dr. Amos Grunebaum

Reducing Neonatal Respiratory Problems (continued from page 1)

The new study enrolled more than 2,800 pregnant women deemed at high risk of delivery during the late preterm period (34-36 weeks of gestation). The women were randomized to receive two injections of the steroid betamethasone or a placebo, given 24 hours apart.

The investigation found that babies whose mothers received betamethasone had a significantly lower rate of severe respiratory complications shortly after birth compared with those whose mothers were given a placebo. In particular, neonates from the treatment group had significantly lower rates of bronchopulmonary dysplasia and those in the treatment group were significantly less likely to require a long-term stay in the neonatal intensive or intermediate care unit or require respiratory treatments such as surfactant.

Approximately 8 percent, or more than 300,000 babies, are born in the late preterm period each year. Of those, roughly 12 percent need persistent respiratory support or have other serious complications requiring prolonged stays in a special care nursery. Neonates with severe respiratory problems are at higher risk for long-term complications, such as chronic lung disease and neurodevelopmental problems, throughout infancy and childhood. "While survival among late preterm infants is comparable to that of babies born at term, the rate of respiratory problems and other serious complications in this group is not comparable and remains unacceptably high," says Dr. Gyamfi-Bannerman. "Expanding the use of a well-studied, safe medication to improve lung development before

birth offers a means of preventing many of these complications. This will transform the way we care for mothers at risk for late preterm delivery."

In fact, the study, which was presented in February at the Society of Maternal-Fetal Medicine's 36th Annual Pregnancy Meeting, has led to changes in guidelines by the Society. On March 21, the Society issued a statement to help guide clinicians on how to implement the new intervention.

The investigators plan to conduct further studies to determine if giving corticosteroids to mothers at risk for late preterm delivery ameliorates their children's risk of long-term health problems.

Reference Articles

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Episiotomy: Is it Worth the Risk?



Dr. Alexander M. Friedman

According to a recent study in *JAMA* by Alexander M. Friedman, MD, MPH, Assistant Professor of Obstetrics and Gynecology at Columbia University Medical Center, episiotomy declined in the U.S. between 2006 and 2012. This is a relatively common procedure, even though limited use of episiotomy has been recommended because of the risks related to the procedure, such as bleeding, tearing past the incision into the rectal tissues

and anal sphincter, perineal pain, infection, perineal hematoma, and pain during sexual intercourse.

"Episiotomy used to be performed because there was a supposed benefit in preventing more serious vaginal lacerations and promoting healing after delivery," says Dr. Friedman. "Research has shown that this isn't the case, and that the procedure may be associated with worse pain and lacerations."

Analyzing data from 2,261,070 women who were hospitalized for a vaginal delivery in 510 hospitals, 325,193 underwent episiotomy (14.4 percent). There was a decline in the rate of episiotomy between 2006 (17.3 percent) and 2012 (11.6 percent). In addition, several demographic characteristics were associated with receipt of episiotomy: 15.7 percent of white women versus

A study by Columbia researchers found that episiotomy rates were above 30 percent in some hospitals, while in others they were below 5 percent.

7.9 percent of black women, and 17.2 percent with commercial insurance versus 11.2 percent with Medicaid insurance. The study also found that hospital characteristics, such as rural location and teaching status, were related to fewer episiotomies.

"Our study found that the probability of receiving an episiotomy depended largely on the hospital where a patient delivered," Dr. Friedman states. "Certain hospitals had episiotomy rates above 30 percent, meaning they are probably doing episiotomies that do not need to be done, while other hospitals had episiotomy rates below 5 percent. Variation between hospitals suggests that episiotomy use could be further reduced by improving care quality."

[Adapted with permission from *Connections*, the newsletter of Columbia Women's and Children's Health, Spring 2015.]

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Friedman AM, Ananth CV, Prendergast E, D'Alton ME, Wright JD. Variation in and factors associated with use of episiotomy. *JAMA*. 2015 Jan 13;313(2):197-99.

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Improving Patient Safety on an Obstetrics Unit (continued from page 1)

about teamwork. “The concept of team training was adapted from the airline industry, which has a long history of incorporating specific training for crew members on working as a team and proven results in safety records.

“We trained about 450 personnel from all different areas, including pediatricians, neonatologists, nurses, unit clerks, residents, and others to improve communication and to share best practices and new protocols,” says Dr. Grunebaum. “Since then, all new staff have been required to attend labor and delivery team training sessions. Attending physicians are instructed that credentialing and privileges will not be granted or renewed if the program has not been completed.”

According to Dr. Grunebaum, at the time they undertook the obstetric patient safety program, liability premiums for obstetricians had reached astronomic levels. “One of the first things we did prior to beginning this project was to do a close assessment of our obstetric service, looking at all of the adverse events and addressing those issues to make sure that they didn’t happen again,” he says. “We looked for commonalities and found several, including the use of oxytocin for inducing labor.”

This led to the establishment of a uniform low-dose oxytocin labor induction and stimulation policy with a 19-item standardized protocol on all labor and delivery units. The new protocol included premixed magnesium sulfate and oxytocin solutions, color-coded magnesium sulfate and oxytocin containers and intravenous lines, using both with “smart pumps.”

Over several years, Dr. Grunebaum and his colleagues in the Department of Obstetrics and Gynecology continued to implement patient safety measures, among them:

- routine thromboembolism prophylaxis for all Cesarean deliveries
- discontinuation of misoprostol, which has been shown to cause complications during labor and delivery
- postpartum hemorrhage kit that includes the four most important drugs used for postpartum hemorrhage



Dr. Amos Grunebaum

- recruitment of an obstetric patient safety nurse, physician assistants for labor and delivery, and an in-house laborist for nights and weekends
- national certification of staff in electronic fetal monitoring interpretation

The Department of Obstetrics and Gynecology at NewYork-Presbyterian/Weill Cornell was also among the first at the Hospital to require electronic medical record charting. They subsequently instituted electronic medical record templates for several clinical situations, including shoulder dystocia and operative deliveries, an electronic online communication whiteboard programmed and implemented by the department, and electronic antepartum medical record charting.

The results of the study following the implementation of these and other initiatives, which were published in the *American Journal of Obstetrics & Gynecology*, demonstrated an increase in patient safety and a decrease in sentinel events. “Our C-section rate also dropped by 25 percent,” says Dr. Grunebaum, “and for the last three years it has been significantly below the national average even though we have a very high-risk population.”

Dr. Grunebaum points out that since they have made numerous changes over several years, the impact of any one change on a single outcome measure cannot be individually determined. However, his message for other obstetrics programs is simple. “It is possible to continually make childbirth safer. To paraphrase Ralph Waldo Emerson, we believe that achieving patient safety on labor and delivery is a journey, not a destination. It requires extensive and considerate changes, physician and staff cooperation, constant vigilance, flexibility, and rapid adaptation based on new experiences. We need to always be on the alert for making changes and to be flexible in order to improve our patient outcomes.”

Obstetric Patient Safety Measures

Personnel

- Labor and delivery team training
- Dedicated gynecology attending on call
- Obstetric patient safety nurse
- Physician assistants for labor and delivery
- In-house laborist for nights and weekends
- Electronic fetal monitoring interpretation certification

Clinical

- Standardized oxytocin labor induction and stimulation protocol
- Premixed, color-coded labeled magnesium sulfate and oxytocin solutions
- Routine thromboembolism prophylaxis for all Cesarean deliveries
- Obstetric emergency drills
- Postpartum hemorrhage kit

Operational

- Electronic medical record charting
- Electronic medical record templates for shoulder dystocia
- Electronic online communication whiteboard
- Electronic antepartum medical records

Reference Article

Grunebaum A, Chervenak F, Skupski D. Effect of a comprehensive obstetric patient safety program on compensation payments and sentinel events. *American Journal of Obstetrics & Gynecology*. 2011 Feb;204(2):97-105.

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