



CIRWH NEWS FLASH

Center for Interdisciplinary Research in Women's Health

FALL 2007

THE UNIVERSITY OF TEXAS MEDICAL BRANCH

VOLUME 5, NUMBER 2

From the Director's Desk



This month's issue of the CIRWH newsletter focuses on preterm birth—what causes it, how to prevent it, what to do if you think you're going into preterm labor, and what to do if it does happen.

This topic was chosen to coincide with the Daniel W. Kempner Foundation Seminar, "Babies at Risk," which will be held at the Galveston Island Convention Center on Nov. 27. CIRWH is proud to be a sponsor of this exciting event. There will be some wonderful speakers at the symposium and we encourage you to attend. There is more about this event on page 3.

Our Faculty Spotlight this issue shines on Dr. Mahmoud Ahmed, who, among other research interests, is investigating ways to help pregnant women quit smoking without posing any threat to the developing fetus.

In other CIRWH news, the winner of the 2007 seed grant was Elisabeth Borsheim with the proposal entitled "Visceral Fat Contribution to Very Low Density Lipoprotein Triglyceride Synthesis in Women." We congratulate Dr. Borsheim on her excellent proposal and we look forward to her presentation at the CIRWH seminar series in the Fall of 2008.

Abbey Berenson

Abbey B. Berenson, MD
Director

FOCUS on PRETERM BIRTH

Preterm babies face many challenges as a result of not being able to complete a healthy pregnancy. These challenges may have long-term health consequences such as learning disabilities, mental retardation, cerebral palsy, and blindness or vision impairment. The number of extremely premature babies who survive to adulthood is increasing, so we need to ensure their good health in order to minimize the possibility of problems later in life.



The number of babies born prematurely in the United States has increased in recent years, and in 2003 it was 12 percent of all births, despite a U.S. Public Health Service goal to reduce the premature birth rate to 7.6 percent by 2010. Although multiple births account for a number of the preterm births, the rate for singleton preterm births is also rising.

According to Jennifer L. Howse, PhD, president of March of Dimes, the biggest cause of premature birth is "Factor X": Half of the premature births are to women who have no known risks and do everything right in their pregnancies. Scientists do not know why. Much more research is needed to understand the full molecular biology of normal pregnancy so that premature births can be avoided.

You can find the full CDC article, "Births: Final Data for 2003," on the CDC web site, http://www.cdc.gov/nchs/data/nvsr/nvsr54/nvsr54_02.pdf. Additional information about preterm birth can be found at WebMD, <http://www.webmd.com/baby/tc/preterm-labor-topic-overview>.

Faculty Spotlight: Dr. Mahmoud S. Ahmed

Dr. Mahmoud Ahmed earned his PhD (Biochemistry) at the University of Tennessee Center for Health Sciences and did his postdoctoral training at Johns Hopkins University. He taught and pursued his research at the University of Tennessee in Memphis and at the University of Missouri in Kansas City before coming to UTMB in 2002, where he is now a professor in the Division of Maternal-Fetal Medicine and in the graduate programs in the Department of Pharmacology and Toxicology and the Department of Biochemistry and Molecular Biology.



What is the focus of your research in women's health?

Our lab focuses on understanding the molecular mechanisms underlying the changes in the pharmacokinetics and dynamics of drugs administered during pregnancy. We are one of four sites in the United States that the NICHD funded to conduct translational and clinical investigations of therapeutics used for treatment of the pregnant patient. Dr. Gary Hankins is PI (Obstetrics) and I am the co-investigator

(Continued on Page 3)

Premature Birth: Who's at Risk?

Preterm labor and delivery can happen to any pregnant woman, but some women are at higher risk than others. Researchers have identified some risk factors, but still cannot predict which women will give birth too early. Having a risk factor does not mean a woman will have preterm labor or preterm birth. It means she is more likely to have preterm labor or birth than other women.

Three groups of women known to be at greatest risk of preterm labor and birth include:

- Women who have had a previous preterm birth
- Women who are pregnant with twins, triplets or more
- Women with certain uterine or cervical abnormalities

If a woman has any of these three risk factors, it's especially important for her to know the signs and symptoms of preterm labor and what to do if they occur.

Lifestyle and Environmental Risks

In addition, some studies have found that certain lifestyle factors may put a woman at greater risk of preterm labor. These factors include:

- Late or no prenatal care
- Smoking
- Drinking alcohol
- Using illegal drugs
- Exposure to the medication DES
- Domestic violence, including physical, sexual, or emotional abuse
- Lack of social support
- Stress
- Long working hours with long periods of standing



Medical Risks

Certain medical conditions during pregnancy also may increase the likelihood that a woman will have preterm labor. These conditions include:

- Urinary tract infections, vaginal infections, sexually transmitted infections, and possibly other infections
- Diabetes
- High blood pressure
- Clotting disorders (thrombophilia)
- Bleeding from the vagina
- Certain birth defects in the baby
- Being pregnant with a single fetus after in vitro fertilization (IVF)

- Being underweight before pregnancy
- Obesity
- Short time period between pregnancies (less than 6-9 months between birth and the beginning of the next pregnancy)

Researchers also have identified other risk factors. For instance, African-American women, women younger than 17 years or older than 35, and socioeconomically disadvantaged women are at greater risk than other women. Experts do not fully understand why and how these factors increase the risk that a woman will have preterm labor or birth.

What Can Women Do?

Remember though, even if a woman has one of these risk factors, it does not mean she will have preterm labor. It just means that she is at greater risk than a woman who does not have one or more of these risk factors. That's why it's so important that women:

- Know the signs and symptoms of preterm labor
- Know what to do if they begin experiencing any of them
- Make an extra effort to take very good care of themselves and their babies while they're pregnant

This is the best way for women to protect themselves and their babies against preterm labor and delivery.

Preterm Labor Warning Signs for Pregnant Women

Here are the warning signs:

- Contractions (your abdomen tightens like a fist) every 10 minutes or more often
- Change in vaginal discharge (leaking fluid or bleeding from your vagina)
- Pelvic pressure—the feeling that your baby is pushing down
- Low, dull backache
- Cramps that feel like your period
- Abdominal cramps with or without diarrhea

If You Think You're Having Preterm Labor . . .

Call your health care provider (nurse, doctor or midwife) or go to the hospital right away if you think you're having preterm labor, or if you have any of the warning signs. Call even if you have only one sign.

The March of Dimes is funding research to better understand risk factors and the causes of premature birth. This information was obtained from the March of Dimes web site at http://www.marchofdimes.com/prematurity/21239_5810.asp.

Additional Resources on the Internet:

WebMD – <http://children.webmd.com/tc/Premature-Infant-Frequently-Asked-Questions>

March of Dimes – <http://www.marchofdimes.com/prematurity/prematurity.asp>

Mayo Clinic – <http://www.mayoclinic.com/health/premature-birth/DS00137/>

Daniel W. Kempner Foundation Symposium

The Center for Interdisciplinary Research in Women's Health is a sponsor of the Daniel Kempner Foundation Symposium "Babies at Risk" scheduled for Nov. 27, 2007. The event will be held at the Galveston Island Convention Center.

The keynote talk will be "Chronic Disease in Adults Begins in the Womb," presented by David Barker, MD, PhD, FRC. Dr. Barker is the originator of the "Fetal Origins Hypothesis," which claims that "coronary heart disease, and the diseases related to it, originate through responses to undernutrition during fetal life and infancy." This risk for later chronic disease is further increased if the baby has low weight gain after birth and at two years old is thin or stunted.

These findings point to the importance of protecting the nutrition and health of the pregnant woman and protecting the growth of infants.

In addition, Dr. Donald Mattison, who is Senior Advisor to the Directors of the National Institute of Child Health and Human Development, and Senior Advisor and Chief of the Obstetric and Pediatric Pharmacology Branch in the Center for Research for Mothers and Children, will give a talk entitled "The Challenges of Prematurity"; and Dr. Jon Tyson, Director of the Center for Clinical Research and Evidence-Based Medicine at the University of Texas – Houston Medical School, will discuss "Evidence-Based Ethics and the Care of the Extremely Premature Infant." Additional speakers are Susan Keeney, MD, George Saade, MD, Karen Smith, PhD, and Monica Longo, MD, PhD (UTMB).

Additional information about the symposium can be found at www.UTcme.net or you can call 409-772-9308.

Faculty Spotlight, *continued*

(Pharmacology). We are also funded by NIDA (Drs. Ahmed, Nanovskaya, and Hankins) to investigate drugs available for treatment of pregnant opiate and nicotine addicts.

Why did you go into this area of research?

In 1975 opiate receptors were identified for the first time, and I became fascinated with the molecular mechanisms of drug addiction, especially in pregnant women and their unborn babies. Since then, the emphasis of my research has extended to other therapeutic drugs that are prescribed for pregnant women, including drugs used to treat gestational diabetes and preterm deliveries. The physiological changes in women with the onset of pregnancy affect the distribution of the drug, so risks may differ at different stages of pregnancy in the same individual as well as between women due to their genetic make-up/race.

What are the ramifications of your research for pregnant women and their babies?

We know that opiates, nicotine, alcohol, and the mother's poor health, including gestational diabetes, can threaten the wellbeing of a fetus. Women with these addictions or who have gestational diabetes or other medical conditions, need to be treated for their own sakes and so that the baby's environment is optimized. Usually, the best a practitioner can do when contemplating a treatment option for a pregnant woman is to weigh the risk to the mother if she does not receive treatment (without whom the baby will not survive) and the possible—unknown and incalculable—risk to the child if she does receive treatment.

We need to know how to treat the mother in order to avoid the known risks of preterm birth and low birth weight—without introducing new risks to the fetus. This is the focus of our research. By treating the mothers without putting the babies at risk, the health problems that preterm and low-birth-weight babies often experience throughout their lifetimes will be avoided.

What do you enjoy most about your work?

This job is never routine. Every day there are new challenges to overcome and problems to solve. In the last 15 years, particularly, I feel that I am coming close to doing something that will benefit humanity.

What do you hope to achieve through your research?

I hope our research will reveal ways to treat a pregnant woman without harming her baby, and thus give the developing fetus the best chance of going to full term.

Dr. Tatiana Nanovskaya is a member of Dr. Ahmed's research team. She received her DDS and PhD (Pharmacology) from Minsk State Medical University in Belarus. She did her postdoctoral fellowship with Dr. Ahmed at the University of Missouri (1999–2002). She is currently an assistant professor in the Division of Maternal-Fetal Medicine at UTMB and director of the core laboratory for the NICHD center at UTMB.

In September Dr. Nanovskaya received an R01 grant from the National Institute on Drug Abuse (NIDA) for research entitled "Development of Bupropion for Smoking Cessation During Pregnancy." Bupropion (sold as Wellbutrin) has proven successful in aiding men and nonpregnant women quit smoking. Babies of women who smoke are more at risk than women who don't smoke, but information on the effects of bupropion on the pregnant woman and developing fetus is scarce. This research aims to provide information on the biodisposition of bupropion and its major pharmacologically active metabolite hydroxybupropion by the human placenta and to determine their concentration in the fetal circulation. If it can be shown that bupropion does not harm the developing fetus, it would benefit both mother and child if the mother stopped smoking.

Preterm Labor and Birth—Prevention

The following information is taken from the Mayo Clinic's web site, <http://www.mayoclinic.com/health/premature-birth/DS00137/DSECTION=8>.

A healthy lifestyle can go a long way toward preventing preterm labor and birth.

- **Seek regular prenatal care.** Mention any signs or symptoms that concern you, even if they seem unimportant.
- **Eat healthy foods.** During pregnancy, you'll need more folic acid, calcium, iron, protein, and other essential nutrients. A daily prenatal vitamin—ideally starting a few months before conception—can help fill any gaps.
- **Manage chronic conditions.** Remember, uncontrolled diseases such as diabetes and high blood pressure increase the risk of preterm labor. Work with your doctor to keep any chronic conditions under control.
- **Follow your doctor's guidelines for activity.** If there are problems with your pregnancy, your doctor may suggest working fewer hours or spending less time on your feet. It may make sense to scale back other physical activities, too.

- **Avoid risky substances.** Smoking may trigger preterm labor. Alcohol and recreational drugs are off limits, too. Even over-the-counter supplements and medications deserve caution. Get your doctor's OK before taking any medications or supplements.
- **Ask your doctor about sex.** Sex may be off limits if you have certain complications, such as vaginal bleeding or problems with your cervix or placenta.
- **Limit stress.** Set reasonable limits—and stick to them. Set aside some quiet time every day. Ask for help when you need it.
- **Take care of your teeth.** Brush and floss daily, and visit your dentist for regular cleanings and dental care. Gum disease may be associated with preterm birth.

Some research suggests that the hormone progesterone may prevent preterm labor in women at high risk. If you're a candidate for this treatment, your doctor may recommend weekly progesterone injections. Although promising, the effectiveness of progesterone treatments in preventing preterm labor isn't yet clear.

The CIRWH News Flash is published quarterly by the Center for Interdisciplinary Research in Women's Health at the University of Texas Medical Branch at Galveston.

Director of CIRWH
Abbey B. Berenson, MD

Contact us: sjentick@utmb.edu
Sarah Enticknap
Phone: (409) 772-2985
Mail: CIRWH
The University of Texas
Medical Branch
301 University Boulevard
Galveston, Texas 77555-0587
Web site: www.utmb.edu/cirwh