

# Pulmonary HT in Pregnancy With 100% Survival

BY MITCHEL L. ZOLER

Philadelphia Bureau

PHILADELPHIA — A Milwaukee cardiologist seems to have defied the textbook on what happens to women who develop pulmonary hypertension while pregnant.

The medical literature generally says that about half of these women will die during or soon after delivery if they carry the pregnancy close to term.

But a series of 40 pregnant women with pulmonary hypertension who were seen or consulted on by Dr. Diane L. Zwicke during 2000-2008 have all survived, and 39 of them delivered healthy infants, she reported at the annual meeting of the American College of Chest Physicians.

The pregnancy of the 40th woman was electively terminated at 22 weeks.

Despite this perfect survival record so far, Dr. Zwicke is very cautious about the immediate implications of her series.

"I have not encouraged any women with pulmonary hypertension to get pregnant. We don't have enough data to say that yet." In all except one instance the 27 women directly treated by Dr. Zwicke and the 13 cases for which she provided ongoing consultation involved women who were diagnosed with pulmonary hypertension after they became pregnant.

She also warns the women who choose to continue their pregnancy that they must be willing to do everything she instructs them to do, they must come in for every appointment, and they must understand what the medical literature says: that in the past many of these pregnancies have been fatal for the mothers.

The cases are generally first identified at 15-20 weeks gestation. The first clue that something is wrong is when exercise-induced dyspnea or the woman's weight gain is disproportionate to the pregnancy, said Dr. Zwicke, a cardiologist in a group practice in Milwaukee.

The patients that she has managed had an average

age of 27 years (range 19-36 years). The most common cause of their pulmonary hypertension was idiopathic, in 50%, followed by congenital heart disease in 18%, mitral valve disease in 10%, and lupus in 10%.

Their average pulmonary artery pressure was 59 mm Hg (range of 37-86 mm Hg), their average right-ventricular ejection fraction was 30%-35% (range of 20%-45%), and their average right atrial pressure was 10 mm Hg (range 7-20 mm Hg).

Thirty-nine of the mothers were treated with intravenous prostaglandin infusions; 1 patient was primarily treated with a calcium channel blocker. Several other drugs were also used throughout pregnancy, but prostaglandin infusion is key. "There is never too much prostaglandin," she said. "The dosage must rise as soon as possible."

Thirty-four of the babies were delivered vaginally following induction. The remaining five live births were by cesarean section. No pregnant mother with pulmonary hypertension should expect a natural delivery, Dr. Zwicke said.

One newborn required 2 days on a ventilator after delivery. All of the other 38 were ready to go home by the third day after delivery.

Following diagnosis, the most critical time during pregnancy is weeks 30-36, when hormonal and fluid shifts start to become dramatic.

Prior to 30 weeks' gestation, women can be monitored every 4 weeks by ultrasound.

Starting at week 30, ultrasound examination of the right heart must be done weekly. These exams should be done by the same echocardiographic technician to help insure consistent images.

The key member of the delivery team is a cardiologist or pulmonologist, who is the person reading the weekly echocardiograms and deciding whether the

patient's clinical state and right-heart function has deteriorated so severely during the prior week that delivery must occur immediately. This happens when the patient can no longer do the exertional tasks that they could do the prior week, and when their right-side ejection fraction, right ventricular size, and right atrial size have all become very compromised.

During this key period of weeks 30-36, if "I can identify a reason why the patient is deteriorating and I can fix it, then we'll let the pregnancy continue." But if there is no obvious explanation for the deterioration and their status is worrisome or worsening, then delivery is immediately begun.

Right-heart status is more important than their pulmonary artery pressure, Dr. Zwicke said. If no crisis occurs, delivery is induced after 36 weeks' gestation.

Once delivery starts, the key to success is careful fluid control. Every milliliter that enters the women must eventually get taken out because of the high risk from excess fluid in these patients. "It's all about the right ventricle being able to handle the fluid," she said.

After delivery, the mother is taken to the ICU and closely monitored and treated so that she loses an average of three liters of fluid a day for 3 days.

This is another critical time for the mother, especially the last several hours leading up to a full 72 hours elapsed following delivery. The normal redistribution of fluid within the mother that occurs at this time must be very tightly monitored.

The mother can usually be discharged on a low-dose diuretic 7 days after delivery and should be completely stable within 6-8 weeks.

Dr. Zwicke has follow-up data on her 40 patients for a minimum of 2-3 months following delivery and during that period there were no complications. ■



**Right-heart status is more important than their pulmonary artery pressure.**

DR. ZWICKE

## Contingency Mx Helps Pregnant Women Stop Smoking

BY FRAN LOWRY

Orlando Bureau

BOCA RATON, FLA. — In a pilot study of pregnant women who continued to smoke cigarettes despite knowing they were pregnant, 11 (37%) of 30 women who received contingency management achieved abstinence, compared with just 2 (10%) of 23 women who did not.

This result highlights the effectiveness of contingency management as a strategy to help pregnant women stop smoking, Dr. Sarah Heil said at the annual meeting of the American Academy of Addiction Psychiatry.

The women in both the contingent group and noncontingent group were seen every day for the first 5 days of the study.

During this time, abstinence was based on a breath carbon monoxide level of 6 parts per million or less, said Dr. Heil of the University of Vermont, Burlington.

After the first 5 days, the women were seen according to the following schedule:

- ▶ Twice a week for 7 weeks.
- ▶ Once a week for the next 11 weeks.
- ▶ Once every other week until delivery.

▶ Once a week for the first 4 weeks post partum.

▶ Every other week for the next 8 weeks.

Abstinence in this phase of the study was assessed by measuring urine cotinine levels; levels of 80 ng/mL or less were indicative of abstinence.

The women were rewarded with vouchers, which were earned contingent on biochemically verified abstinence.

The voucher value began at \$6.25 and escalated at a rate of \$1.25 per consecutive negative sample up to a maximum of \$45.

"These vouchers are like having a bank account with us. We put their money into an account, and they are allowed to spend it on things we believe are appropriate. So there were a lot of gift certificates, paying of credit card bills, and shopping at Wal-Mart and grocery stores," Dr. Heil said.

Women who were randomized to noncontingency management got

vouchers independent of their smoking status.

The vouchers were a flat \$11.50 per antepartum visit, and \$20 per each postpartum visit.

The women in the study had been smoking for about 8 years; most of them lived with other smokers.

They smoked approximately one pack of cigarettes a day before pregnancy, but had reduced this amount by roughly 50% by the time they entered the study.

"They had very high intentions to quit while they are pregnant," Dr. Heil noted.

Most of the women had less than a high school education, and few of the women were married.

To be considered abstinent at each time point, the women had to self-report that they had not had a cigarette—"not even a puff"—in the last 7 days, as well as the appropriate urine cotinine level.

The effects obtained in the study per-

sisted 3 months after delivery, and for a further 3 months, even though the voucher program was discontinued at 3 months post partum.

This was true for women in the contingent and noncontingent groups, Dr. Heil said.

Importantly, fetuses in the contingent group gained weight faster than those in the noncontingent group. Fetal weight was estimated by measuring fetal length and abdominal circumference by ultrasound.

"We are really excited by these results," she said.

Cigarette smoking is the leading preventable cause of poor pregnancy outcomes in the United States.

Placental abruptions, small gestational age, preterm and still birth, low birth weight, and increased risk for sudden infant death syndrome are all associated with cigarette smoking by the mother.

The adverse effects of smoking on the neonate cost \$1,630/birth per year in 2008 dollars.

Dr. Heil said she hopes to extend her research on contingency management to include pregnant smokers who are also opioid dependent. ■



**The women were rewarded with vouchers—earned contingent on biochemically verified abstinence.**

DR. HEIL