New Tests for Down Syndrome, Preterm Labor

Experimental technologies diagnose Down syndrome and assess amniotic fluid to predict preterm delivery.

BY TIMOTHY F. KIRN
Sacramento Bureau

Reno, Nev. — New technologies that can screen through the entire metabolite or protein compliment of a fluid will soon produce both a test that can correctly identify the patient experiencing early contractions who will deliver prematurely, and a maternal blood test perhaps 100% accurate for Down syndrome, predicted two speakers at the annual meeting of the Society for Maternal-Fetal Medicine.

These tests could be ready for the clinic in a few years, the speakers said.

In much the same way that researchers can study genomics to identify all the genes in a particular cell, and RNA transcriptomics to identify specific genes being expressed in a cell, it is now possible to study proteomics and even metabolomics, to profile all the biochemical components of a given cell, organ system, or fluid in hopes of identifying specific biomarkers for a given condition.

Using that technology, investigators have now identified a profile of amniotic fluid that predicts which patients who go into premature labor with intact membranes will deliver early and therefore warrant tocolysis, said Roberto Romero, M.D., chief of the perinatology research branch of the National Institute of Child Health and Human Development.

Dr. Romero said he and his coworkers profiled 186 metabolites from the amniotic fluid taken from 115 women who were having premature contractions, and were able to find a group of carbohydrates that correctly identified those who actually delivered preterm with 88% accuracy. The women who delivered early had low concentrations of this group of carbohydrates, while those who did not deliver had high concentrations.

The profile correctly identified 39 of 40 patients who delivered at term, 29 of 33 patients who delivered early but had no evidence of intraamniotic inflammation, and all 42 of the patients who delivered early and had evidence of inflammation.

The individual carbohydrates in the group are not unique in any way, Dr. Romero said, and he speculated that they are fetal products.

Dr. Romero declared no personal financial conflict of interest with regard to the study, but the National Institutes of Health has applied for a patent based on the team's findings.

In another presentation, Mary D'Alton, M.D., said she and her colleagues took maternal serum from 50 Down syndrome–affected pregnancies and compared it with serum from 50 unaffected pregnancies, and have been able to identify a group of six proteins that when combined as biomarkers can pick up Down syndrome with 100% accuracy.

Two of these protein biomarkers are overexpressed in Down syndrome cases and four are underexpressed, and this pattern is present in both the first and second trimesters, said Dr. D'Alton, director of the division of maternal-fetal medicine at New York-Presbyterian Hospital, New York.

Most of these proteins have not previously been known to be associated with Down syndrome, and none of them are products of the expression of genes on chromosome 21, she added.

Dr. D'Alton's study was supported by the NIH and ProteoGenix Inc. of Portland, Ore. ■

Long Induction Considered Safe, Does Not Increase Morbidity

BY TIMOTHY F. KIRN
Sacramento Bureau

Reno, Nev. — Allowing a labor induction in a nulliparous patient to proceed for up to 18 hours is a reasonable practice that does not increase the rate of serious neonatal or maternal morbidity and results in vaginal delivery for most patients.

That finding emerged from a study presented in a poster by Charla E. Simon, M.D., and associates at the annual meeting of the Society for Maternal-Fetal Medicine.

The investigators reported on the outcomes of 397 prospectively enrolled nulliparous patients undergoing labor induction, some of whom had a latent phase that went on for 24 hours.

During the first 18 hours, there was no great increase in the percentage of patients who went to cesarean delivery, and—although chorioamnionitis and postpartum hemorrhage became more frequent the longer an induction went on—this did not result in a greater rate of transfusion, hysterectomy, or prolonged hospitalization.

"I think the investigation shows we can be a little patient, and everything is still going to be okay," Dr. Simon, of the department of obstetrics and gynecology at Northwestern University, Chicago, said in an interview.

After 18 hours, however, the rate of cesarean delivery increased significantly, as did the rate of infant admission to the neonatal intensive care unit.

All of the patients in Dr. Simon's investigation were at 36 weeks' gestation or later, and the outcomes were stratified by the length of the patient's latent phase of labor, which started with the initiation of oxytocin and the performance of an amniotomy and ended either with a cervical dilation of 4 cm with 80% effacement or with a 5-cm dilation with less effacement.

The cesarean rate was less than 20% for those with a latent phase of 0-6 hours. That rate increased to about 30% for those with a longer latent phase and stayed there, even for those in latent labor up to 18 hours. But after 18 hours, the rate rose to almost 70%.

The rate of postpartum hemorrhage was about 12% for those with a latent phase of 12-18 hours. It jumped to 26% for those with a latent phase longer than 18 hours.

The rate of chorioamnionitis was 10% for those with a latent phase of 6-12 hours, jumped to 28% for 12-18 hours, and fell to 16% for those latent over 18 hours.

Regarding neonatal morbidity, the percentage of infants with an Apgar score less than 7 was about 2% when the mothers had latent labor lasting 6-12 hours; it rose to 8% when mothers were latent for 12-18 hours, and to 10% when mothers were latent longer than 18 hours.

The rate of infants admitted to the neonatal intensive care unit was 6% when the mothers had a latent phase of 12-18 hours, and slightly more than 10% when latent labor was longer than 18 hours.

Overall, the study found that by 18 hours, 95% of the induced nulliparous women had entered active labor. ■

Cesarean Delivery Rate by Length of Latent Labor

Time(hr)	Percentage	Number of Patients
0-3	16%	10 of 63
3-6	14%	15 of 111
6-9	33%	35 of 106
9-12	31%	15 of 49
12-15	29%	10 of 35
15-18	36%	5 of 14
18-21	69%	9 of 13
21-24	67%	4 of 6

Source: Dr. Simon

Digital/Manual Rotation Reduces Need for C-Section

BY ROBERT FINN
San Francisco Bureau

Reno, Nev. — Digital or manual rotation of fetuses in the persistent occipitoposterior position reduces the need for instrumental deliveries and cesarean section, reported O. Reichman, M.D., and colleagues at Shaare Zedek Medical Center, Jerusalem.

In a prospective, nonrandomized study, the investigators studied 61 women with a fetus in the occipitoposterior position who had completed half of the normal second stage of labor. The first group of 30 women was allowed to continue labor without intervention. The second group of 31 women underwent digital or manual rotation, the authors wrote in a poster presented at the annual meeting of the Society for Maternal-Fetal Medicine.

A significantly greater percentage in the no-rotation group underwent vacuum extraction (50% vs. 23%) and cesarean section (23% vs. 0%).

There were no significant differences in demographic characteristics between the two groups.

The digital maneuver entails first placing the tips of the index and middle fingers onto the edge of the part of the anterior parietal bone that overlaps the occipital bone in the area of the posterior fontanelle. Next, the clinician exerts pressure with the tips of the fingers to rotate the posterior fontanelle upward and toward the symphysis pubis.

With manual rotation, the clinician inserts the entire hand into the birth canal. He or she first positions the fingers under the lateral posterior parietal bone and the thumb on the anterior parietal bone, and then rotates the fetus's head.

Only 8 of the women in the no-rotation group (27%), compared with 24 in the rotation group (77%), experienced a spontaneous delivery, a significant difference.

A significantly greater percentage of the women in the no-rotation group underwent vacuum extraction (50% vs. 23%) and cesarean section (23% vs. 0%).

In addition, digital/manual rotation was associated with a significantly shorter second stage of labor. As a group, women who underwent digital/manual rotation had a significantly shorter mean hospital stay (3.5 days) than did women in the no-rotation group (4.4 days).

Previous epidemiologic studies have estimated the prevalence of the occipitoposterior position to be about 5%. Among such pregnancies, there is a high incidence of cesarean section, instrumental delivery, third- and fourth-degree perineal tear, postpartum hemorrhage, and puerperal infection.

Although the poster did not mention any adverse events that may have been associated with digital/manual rotation, the authors suggested that the maneuver be considered in cases of occipitoposterior malposition. ■