First-Trimester Stress May Prompt Early Delivery

B Y B E T S Y B A T E S
Los Angeles Bureau

R ANCHO M IRAGE , C ALIF . — Moth-er hormones, Dr. Sandman said at a confer-ence, stress hormones, but those in their third trimester have much higher levels of stress hormones, Dr. Sandman said at a confer-ence on sleep in infancy and childhood sponsored by the Annenberg Center for Health Sciences. Months later, women who had been exposed to the stress of the earthquake early in pregnancy were sig-nificantly more likely than other mothers to deliver early.

An early maternal message that it’s a hostile world primes the placental clock for a CRH (corticotropin-releasing hormone) response later,” he said.

Subsequent studies in 550 consecutive pregnant subjects confirmed a consist-ent link between high levels of maternal cortisol early in pregnancy and elevated levels of placenta-derived CRH in the third trimester. Every 1 U of cortisol (µg/dL) measured at weeks 14-16 predicted 34 U of CRH (pg/dL) at 32 weeks’ gestation.

Elevated CRH not only seems to speed delivery, but also appears to have profound consequences on the fetal response to stim-uli and, later, a child’s response to stress.

The complex interaction between ma-trernal stress, fetal CRH, pregnancy out-comes, and infant and childhood behavior has been the target of studies conducted over more than 12 years as part of the women and children’s health and well-be-ing project at UCI, Dr. Sandman explained.

More than 1,000 women and 600-700 in-fants have been enrolled thus far in stud-ies that began with extensive prenatal as-sessment beginning at about 10 weeks’ gestation. Neuroen-docrinologists measured CRH, the matern-al stress axis, while ul-trasonic examina-tions and studies of fetal behavior contin-ue throughout pregnancy.

Infant stress examinations begin with the routine first heel-stick test received in the nursery, when researchers take advantage of a naturally occurring opportunity to evaluate salivary cortisol. Babies’ respons-es to stress and release of immunos-competent lymphocytes are measured and analyzed as early as 4-6 weeks.

The children continue to be followed. Be-ginning at aged 5-7 years, they are assessed with cognitive tests and structural MRI.

A number of intriguing observations have emerged from the UCI studies, in-cluding evidence that suggests stress in the womb may have far-reaching conse-quences on health and behavior.

The metabolic story begins early in pregnancy, with an increase in neuroepi-thelial from the maternal hypothalamic-pi-tuitary-adrenal stress axis. Apparently in response, the placenta produces circulat-ing CRH, which in turn downregulates the maternal stress system, blocking commu-nication between the hypothalamic and placental systems. Both the quantity and the timing of stress hormone production is important.

“Women, as pregnancy advances, be-come immunized to the effects of stress,” explained Dr. Sandman, who said the find-ing explains why stress hormones were not as high in subjects who experienced the earthquake late in pregnancy.

Further research by the UCI group sug-gest that the fetus is very much influ-enced by stress signals. Fetuses exposed to high levels of stress hormones show a di-minished ability to respond to new and fa-miliar auditory stimuli. After birth, babies exposed early to high levels of stress hor-mones exhibit altered fear responses.

Dr. Sandman said preliminary findings are not altogether surprising. Ani-mal studies show that drought or famine produces smaller offspring, born early. This represents adaptation, since those who survive are rare, requiring less food than usual in an environment of scarce resources.

Preterm birth may be an attempt to es-cape an inhospitable environment, identi-fied as such by an exquisitely sensitive pla-centa measuring signals suggesting malnourishment or high levels of stress.

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Dr. Wu

In a retrospective study, vacuum de-livery from the OP position was four times more likely to result in a sphincter-injuring third- or fourth-degreec tear than vac-uum delivery from the occiput anterior (OA) position.

“This is an im-portant issue to consider when weighing the risks and benefits of performing a vacuum delivery from the OP position, es-pecially when one of the goals is to reduce the risk of maternal perineal trauma,” said Dr. Wu of the University of North Carolina, Chapel Hill.

She retrospectively analyzed a total of 393 vacuum deliveries performed at the university from 1996 to 2003. Anal sphinc-ter injury was defined as a third- or fourth-degree laceration. There were 48 deliveries from the OP position and 345 deliveries from the OA position. Women in the OP group were significantly younger than those in the OA group (24 years vs. 28 years), more likely to be nulliparous (87% vs. 74%), and more likely to have received an episiotomy (35% vs. 14%). The infants’ gestational age, head cir-cumference, and birth weight were not significantly differ-ent between the groups.

Overall, the anal sphincter injury rate was 24%. Signifi-cantly more women in the OP group sus-tained an anal sphincter injury (42% vs. 22%).

In a multivariate analysis that took into account fetal head position, body mass in-dex, race, nulliparity, length of second stage, episiotomy, birth weight and head circumference, the OP position was four times more likely to be associated with an anal sphincter injury than the OA position.

In a previous retrospective study of 588 forceps deliveries, Dr. Wu also found an in-creased anal sphincter injury rate among OP deliveries, compared with OA deliver-ies (51% vs. 33%).

—Michèle G. Sullivan

OP Vacuum Combo Raises Anal Sphincter Injury Risk

White Sulphur Springs, W. Va.—Occiput posterior fetal head position during a vacuum delivery incrementally in-creases the risk of anal sphincter injury above the risk imposed by the vacuum alone, Jennifer Wu, M.D., said at the annual meeting of the South Atlantic Association of Obstetricians and Gynecologists in her retrospective study, vacuum de-livery from the OP position was four times more likely to result in a sphincter-injuring third- or fourth-degreec tear than vac-uum delivery from the occiput anterior (OA) position.

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