Setting odds on extremity defects after CVS

Many pregnant women, especially those over age 35, rely on chorionic villus sampling (CVS) early in pregnancy to tell them if they are carrying a fetus with a genetic abnormality such as Down's syndrome. Doctors perform this procedure during the first trimester, a period when some women are more comfortable opting for an abortion if a defect exists. In contrast, women who get the standard test—amniocentesis—must wait until the second trimester of pregnancy for results.

Despite its obvious advantages, CVS presents a downside: Some studies have linked the procedure to limb defects. Now, Richard S. Olney and his colleagues at the Centers for Disease Control and Prevention (CDC) in Atlanta add to the evidence that CVS may sometimes cause a particular type of limb defect—missing or improperly formed fingers or toes.

Most doctors already tell their pregnant patients that CVS may increase the risk that a baby will be born with such deformities. However, the new study is the first to quantify that risk, Olney says. He presented his team's data June 30 at the annual meeting of the Teratology Society held in Las Croabas, Puerto Rico.

Olney and his team studied the medical records at seven birth defect registries in the United States. The researchers identified 131 infants born with limb defects from 1988 through 1992. The team then matched those cases with 131 babies born during the same period but with another type of defect.

In addition to looking at hospital charts, the team interviewed the babies' mothers by telephone. They noted whether the mother had had CVS, amniocentesis, or no such testing during the pregnancy in question.

The researchers discovered that compared to children of mothers who had gotten amniocentesis or no prenatal testing, children born to mothers who had received CVS faced six times the risk of missing or malformed fingers or toes.

The earlier the CVS procedure, the greater the risk to the baby, the team discovered. The study suggests that more infants whose mothers undergo the test at the eighth or ninth week of pregnancy would have defects than babies whose mothers get CVS later in their pregnancy.

Moreover, babies whose mothers got the earlier CVS testing faced 11 times the risk of limb defects as babies whose mothers had amniocentesis or no testing. That finding fits with an Italian study which showed that infants born to women who chose CVS had 11 times the risk of limb defects, Olney says.

All pregnant women run a slight risk of bearing a baby with such defects, even if they don't undergo CVS, Olney points out. The researchers estimate that the absolute risk of finger or toe defects after CVS exposure remains small—about 1 in 2,900.

Laird G. Jackson of Jefferson Medical College in Philadelphia says the CDC report is just the latest development in the debate over the safety of CVS. He points out that a study he reported in 1993 showed no association between CVS and limb defects. Jackson doesn't want to rule out a very small increase in risk after CVS, but he says that in the hands of a skilled CVS technician, the procedure proves quite safe.

All agree that many questions about CVS remain unanswered. For example, researchers have yet to identify a mechanism by which the procedure might actually cause limb defects. Some scientists speculate that the test somehow blocks the blood supply to the extremities, thus damaging tissue in the fingers or toes of the fetus.

Until the debate gets sorted out, women trying to decide between amniocentesis or CVS should ask their physician to help them size up the risks and benefits of each procedure, Olney says. Women at high risk of having a child with a genetic defect may find that the risks of CVS compare quite favorably to its benefits, he adds.

Women who end up favoring CVS should schedule the procedure at a medical center with a good track record, Jackson notes. And most researchers agree that the safest time to undergo this procedure is after the 10th week of pregnancy. *—K.A. Fackelmann*

Detecting helium in the early universe

Astronomers have long recognized that the space between stars is filled with a thin mixture of gas and dust. But evidence of whether a tenuous gas also pervades the vast expanses between galaxies has remained elusive.

Now, researchers have obtained what may be the first glimpse of this diffuse intergalactic medium. Peter Jakobsen of the European Space Agency in Noordwijk, the Netherlands, and his collaborators report detecting ionized helium along the line of sight to a distant quasar.

"This breakthrough for cosmology provides the first direct evidence that the intergalactic medium is a highly ionized plasma of hydrogen and helium," comments Kenneth M. Lanzetta of the State University of New York at Stony Brook.

The discovery also confirms the existence of substantial amounts of helium in the early universe, as predicted by theories of the formation of chemical elements shortly after the Big Bang, the researchers say.

Jakobsen and his colleagues report their findings in the July 7 NATURE.

The researchers used the Faint Object Camera aboard the refurbished Hubble Space Telescope to look at ultraviolet light coming from a quasar. Any helium ions with a single positive charge along the line of sight to the quasar would absorb light of a characteristic wavelength, leaving a gap in the spectrum of light detected by the telescope.

To make the scheme work, Jakobsen and his coworkers had to find a quasar that was unobscured by massive hydrogen clouds along the path, which would cut off the helium ions' signal.

The quasar also had to be distant. Singly ionized helium normally absorbs light at 30.4 nanometers, which is well beyond the range detected by the camera. But for a sufficiently distant source, the shift to longer wavelengths caused by the universe's expansion brings this light within range.

"We're confined to looking at very remote quasars with redshifts above 3," Jakobsen says. "And we have to find a break in the [hydrogen] cloud cover at this high redshift."

The researchers came up with one candidate – the quasar designated Q0302-003. To their delight, they found that the spectrum of ultraviolet light from this object showed strong absorption at wavelengths that could be attributed to helium ions.

"We're very happy the helium is there," Jakobsen says. The fact that this helium exists as singly charged ions rather than neutral atoms also confirms notions that the early universe was a harsh environment for atoms, he adds.

"The big surprise, however, is the intensity of the absorption," Jakobsen says. Such a large effect is hard to explain on the basis of helium-containing clouds alone.

"The obvious guess is that there's helium between the clouds," he says. "There's a significant chance we're seeing the intergalactic medium."

To determine the proportion of ionized helium in clouds and in the intergalactic medium, the researchers must obtain a spectrum with enough resolution to reveal the characteristic absorption patterns of individual clouds. This requires an exposure lasting tens of hours with one of the telescope's present spectrographs or a wait of several years until an improved spectrograph is delivered to the telescope in the next servicing mission.

"We need to observe it longer," Jakobsen says. "And we have to look for other possible candidates." *—I. Peterson*