

Bad Vibrations? Ultrasound disturbs mouse brains

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Christen Brownlee

Prolonged and frequent use of fetal ultrasound might lead to abnormal brain development, a study in mice suggests. The finding sounds a cautionary note for pregnant women getting the commonplace procedure.

In that technique, an ultrasound probe sends high-frequency sound waves into the abdomen of a pregnant woman. The waves bounce back to detectors, creating images of the fetus. Doctors use the pictures to check for birth defects and to assess a fetus' size and movements. Many women also undergo ultrasounds to create collections of early baby pictures.

Ultrasound has generally been regarded as safe. However, a few studies have suggested that it might cause neurological changes, such as delayed speech or an increase in left-handedness. Researchers hadn't studied how the number or duration of ultrasound procedures affects neurons growing in the fetal brain, says neuroscientist Pasko Rakic of Yale University.

Neurons are created in discrete places within the brain as it develops, and they then travel to the brain's outer layers. Rakic and his colleagues study this process, which is known as neural migration.

To determine whether ultrasound affects neural migration, the team worked with mice at a late point in pregnancy, when new fetal neurons have to migrate a long distance to reach the brain's outer layers.

The researchers injected the animals with a chemical that marks newborn neurons and then applied ultrasound to the bellies of some of the animals over the next 3 days. The ultrasound was administered to each pregnant mouse in multiple sessions that totaled 5 to 420 minutes. With the machine turned off, the scientists touched other mice with the ultrasound probe for the same amounts of time. A third group of animals received no procedure at all.

After the mouse pups were born, the team examined brain slices. In animals whose mothers had had ultrasound sessions that added up to 30 minutes or more, the scientists found that a significant number of neurons destined for the brain's outer layers of gray matter had become improperly embedded in inner layers of white matter.

The number of misplaced neurons increased with the total time that a newborn mouse's mother had spent receiving ultrasound. In contrast, the brains of newborns whose mothers had had the sham procedure typically resembled those whose mothers had had no procedure, Rakic's team reports in an upcoming Proceedings of the National Academy of Sciences.

"When cells are in the wrong place, they might affect function of the cerebral cortex," which in people controls such higher brain functions as language and movement, says Rakic. "We just don't know yet what this could do."

He and his team plan to conduct studies that will determine whether the results hold up in nonhuman primates.

Rakic cautions that some women might be getting excessive sonography. He's especially concerned about so-called keepsake ultrasounds, which are often performed by untrained technicians in nonclinical settings, such as shopping malls.

The mouse results reinforce guidelines set by the Food and Drug Administration, says pediatric neurologist Verne Caviness of Massachusetts General Hospital in Boston. "The basic guidelines in this country suggest using ultrasound as little as possible," he says. "Baby pictures aren't a justifiable use for this technology."

HATHOR the COWGODDESS



I WONDER WHAT MAKES THE SCIENTIFIC COMMUNITY SO TROUBLED BY MYSTERIES? THEY'RE OBSESSED WITH CONTROLLING WHAT THEY DON'T UNDERSTAND!



LIKE DUE DATES, THEY DON'T KNOW WHAT MAKES A BABY "READY" SO THEY INDUCE EARLY, NOT EVEN KNOWING THE COST...



AND WITHOUT KNOWING WHAT IT'S MADE OF, THEY TRY TO REPLACE BREASTMILK!

IT'S LIKE IF I TOOK THIS MYSTERY FROM THE BACK OF MY FRIDGE..



AND WITHOUT KNOWING WHAT IT IS, OR WHAT ITS MADE OF OR... HOOWEE! WHAT THE HECK IS THIS?!

THIS IS ONE MYSTERY THAT'S BETTER LEFT UNSOLVED

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