Study Purpose
What questions are the researchers trying to answer?

The researchers wanted to find out if having an ultrasound when pregnant would increase the chance of having a baby with Autism Spectrum Disorder (ASD).

Over the past 30 years ultrasound has been used by obstetricians to make sure the fetus is growing. And, to see if there is more than one fetus (twins, triplets), and to find out the baby’s due date. Some women don’t know when they became pregnant. It is important for doctors to know when a baby is due. Research shows that as obstetricians have more experience using ultrasound that women may have three or more ultrasound scans while they are pregnant.

Doctors have established safety guidelines so pregnant women are not exposed to ultrasound when it is not needed. When the guidelines are followed, doctors believe that ultrasound is safe and should not create any risk to the fetus. Scientists think that we should study the effects of ultrasound on fetuses, to make sure it is safe. We need scientific proof that ultrasound (especially more than one in a pregnancy) is safe for the fetus. Researchers have studied fetus exposure to ultrasound and how babies do once they are born. They have found mixed results—that is some found it made a slight difference, others found it didn’t.

One set of studies found a modest but significant increase in Autism in boys who were not right-handed and were exposed to ultrasound when their mothers were pregnant. Most people are right-handed. Being left-handed or being able to use both hands is not a disability or a problem. Some studies have found that more children with autism are not right-handed compared to children without autism. This doesn’t mean autism causes children to be left handed or to be able to use both hands.
Research Design
What did the Researchers do?

The researchers looked at medical records of children born between January 1, 1995 and December 31, 1999. All children were born in a Kaiser Permanente of North California (KPNC) hospital. The researchers only chose children who were single births (that is they were not twins, triplets, or other multiple births). The researchers wanted all children in the study to get the same quality of care. They required that the children get pediatric care from Kaiser for at least 2 years after they were born. The mothers of all of the children studied had to be enrolled in the Kaiser health plan through their entire pregnancy.

The final sample (the number of children and mothers studied) included 362 children with ASD. The children had to have at least one diagnosis of ASD based on diagnosis codes in the International Classification of Diseases (ICD; this is what health care providers use to diagnose health problems). There was a second group of 393 children who were “controls.” Children in the control group were matched to the children with ASD in the following way. They were born the same year, they did not have an ASD diagnosis, they had the same gender (male or female), and they were born in the same hospital.

Researchers gathered data from the medical records of these two groups, a total of 755 children (and their mothers). They found all ultrasound exams each child’s mother received when she was pregnant. They recorded the date and time of the ultrasound scan, gestational age (how many weeks pregnant) when the scan was done, the type of scan the mother received, and other key information.

Researchers put all of the data into a database and compared how many ultrasounds children in both the ASD and Control groups received. They were trying to see if mothers of children with ASD had more ultrasound exams than the mothers of children who did not have a child with ASD. They also studied if it made a difference if the fetus was younger or older when the ultrasound was given. They studied if male or female children with ASD had more exposure to ultrasound. Finally, if there was a difference in any of these areas they did a statistical test to see if the difference was “statistically significant” or whether the difference was just by chance.

Results
What did the Researchers find?

The researchers found the following (none were statistically significant). (1) Mothers of children with ASD were older than the mothers of children in the control group. (2) Mothers of children with ASD had significantly more years of education than mothers of children in the control group. (3) Gender (male/female), birth weight, maternal race/ethnicity, and year of birth were not statistically different between the two groups.
In general, the Researchers found that ultrasounds during pregnancy did not increase the risk of having a baby with ASD. There was no link between if the ultrasound was early or late in pregnancy or how many ultrasounds a woman had.

Researchers in this study recommended that other studies of children with ASD be done. The studies could look at ultrasound exposure for children who have mild versus severe autism or children with ASD and other disabilities.

There were two potential problems with this study. First, researchers were not able to identify ultrasound exposure to the fetus (this is call “dose”). It is possible that the amount of ultrasound exposure may make a difference and increase the risk of the fetus having ASD. Second, while the ASD diagnoses were written in the medical record there was not good information about who made the diagnosis and what clinical information was used. The medical record data did not say if the ASD was mild or severe. This might also be important to study in the future.

What does this mean for my child and my family?

If you are concerned, talk to your pediatrician or obstetrician about this study. You might take this brief with you and show it to your doctor.

If you become pregnant, ask your obstetrician about how many ultrasounds you will get. You may want to show this article to him or her.

To read the original scientific journal article please use the following web address link: http://www.springerlink.com/content/k2m83011370n23ph/fulltext.pdf

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Glossary of Terms

**Ultrasound** — This is a type of imaging technique (like taking a picture); it can also be called a “scan.” It uses a device to expose parts of the body to high-frequency sound waves to produce a picture that the doctor can look at. Ultrasounds can show the shape of something and movement, too. Ultrasound exams do not use radiation like x-rays.

**Autism Spectrum Disorders (ASD)** — This term describes a set of psychological conditions which involve abnormalities in social interactions, communication, very limited interests and repetitive behavior. Not all children with autism have problems in all of those areas—some are mild and some are very severe.

**Safety Guidelines** — Doctors and health professionals use “guidelines” to help them provide the right care for patients. Guidelines are not rigid rules for practice. Doctors and health professionals must make decisions about what is right for their patient. When tests are used like x-rays and ultrasound, there are guidelines about how often to use them and when to use them.

**Risk** — Refers to the chances something negative might happen.

**Sample** — This describes who is being studied. It can include their age, whether they are male or female, their race or ethnicity or language spoken, how much education they have.

**International Classification of Disease (ICD)** — This is a way to code diseases, signs and symptoms, abnormal findings, complaints, classified by the World Health Organization (WHO). It provides a number for each disease so that medical providers use the same terms and definitions when they write in medical records.

**Control** — In research studies, one way to be sure that the researcher’s findings are accurate is to collect the same data on people who are identical to the people being studied, except they don’t have the condition being studied. In this study the researchers compared children with ASD to children without ASD (the control group).

**Statistically Significant** — In research, mathematical tests are done to see if a result is statistically significant. This means that we can be confident that the result is likely to be a real difference, not just chance.