

## *Ultrasound Exposure During Pregnancy*

### **Links to Learning Disabilities, ADD and Behavior Disorders**

The following is one chapter from a 1997 Graduate Student Research Project conducted at the University of South Florida. The project involved locating published peer reviewed medical journal articles which have shown various environmental and chemical exposure factors can cause learning disabilities, hyperactivity and other disorders by damaging the delicate brain growth process in the unborn child during pregnancy.

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**Learning Disability Research Web Site:** [www.chem-tox.com/pregnancy/learning\\_disabilities.htm](http://www.chem-tox.com/pregnancy/learning_disabilities.htm)

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#### Ultrasound During Pregnancy

Suggest Routine Exams Not as Safe as Once Thought

**SOURCE:** *Neurotoxicology and Teratology*, Vol. 17(2):179-188, 1995



Ultrasound is used routinely today and usually once or twice during most pregnancies. Physicians and medical personnel have come to believe ultrasound is safe which explains its widespread use. This belief in safety came from the early studies which did not reveal any adverse effects of ultrasound on the human fetus (19,22). However, later investigators reported low birth weight (26) and dyslexia (36) in the exposed children Moore et al. (27), concluded that the most consistent effect of ultrasound exposure appeared to be low birth weight. This is not supported by other workers (24,33). This conflict in research thereby generates enough doubt to allow ultrasound to be used today.

However, as research becomes more sophisticated, researchers are able to detect effects upon the fetus that were missed previously. Also, as mentioned earlier in this paper, the timing of the exposure during pregnancy is often critical for determining whether there is or is not a harmful outcome on neurological development.

The researchers in this present study, were attempting to determine what effect ultrasound would

have if given on two periods early in the test animals' development. Neurological areas tested included assessment of locomotor activity, learning and memory. The procedure involved exposing 23 Swiss albino mice to two 10 minute ultrasound periods on the sixth and eleventh day of their pregnancies. The offspring were then allowed to develop normally and tested for detrimental effects at 3 and 6 months.

Although the head length and brain weight did not show any statistically significant difference from the average control mice values, the researchers did find the ultrasound exposed group had an 8.6% growth retardation rate compared to 3.3% for the non-exposed control group.

According to the researchers, the animals experienced "*hypoactivity and impairment in learning*" as a result of the ultrasound exposure. Learning and memory were tested using a standard passive avoidance test in which the mice were placed into a box that contained a lighted chamber and a dark chamber. If the animal walked into the dark chamber it was given a slight .6 milliamp shock for 2 seconds. After a resting period of 1 minute the animal was reintroduced to the lighted chamber. If the animal did not re-enter the dark chamber for 3 minutes it was considered as a sign of the animal having learned. The researchers did find that the ultrasound exposed group required more trials to learn the shock hazard of the dark area. Whereas, 38% of the control animals required more than 3 trials to learn, 58% of the ultrasound group required 3 or more trials to learn.

In summary, the researchers stated,

*"The postnatal mortality was significantly higher only in the U + U group (Double Ultrasound Exposed Group),,,,,There was a significant change in the locomotor activity with a reduction in the total activity at 3 and 6 months of age in the U + U group. Latency in learning capacity was also noticed in this group. **The results indicate that repeated exposures to ultrasound or its combination with X-rays could be detrimental to the embryonic development and can impair adult brain function when administered at certain stages of organogenesis (organ growth).**"*

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*Neurotoxicology and Teratology, Vol. 17(2):179-188, 1995*

<http://www.chem-tox.com/pregnancy/ultrasound.htm>