

The Correlation between Autistic Spectrum Disorder and Prenatal Ultrasound

1 in 68

Introduction

It is known that autistic spectrum disorder is a genetic disorder. The disorder only occurs if the fetus has a genetic predisposition to autistic spectrum disorder and something in the environment triggers these symptoms. Prenatal ultrasound may be one of those outside triggers that can lead to autistic spectrum disorder, but the research is not entirely conclusive. Current recommendations are to receive one or two prenatal ultrasounds during pregnancy, but on average, pregnant women get at least three to five. If the pregnancy is determined to be high-risk, that amount at least doubles (Abramowicz, 2016).

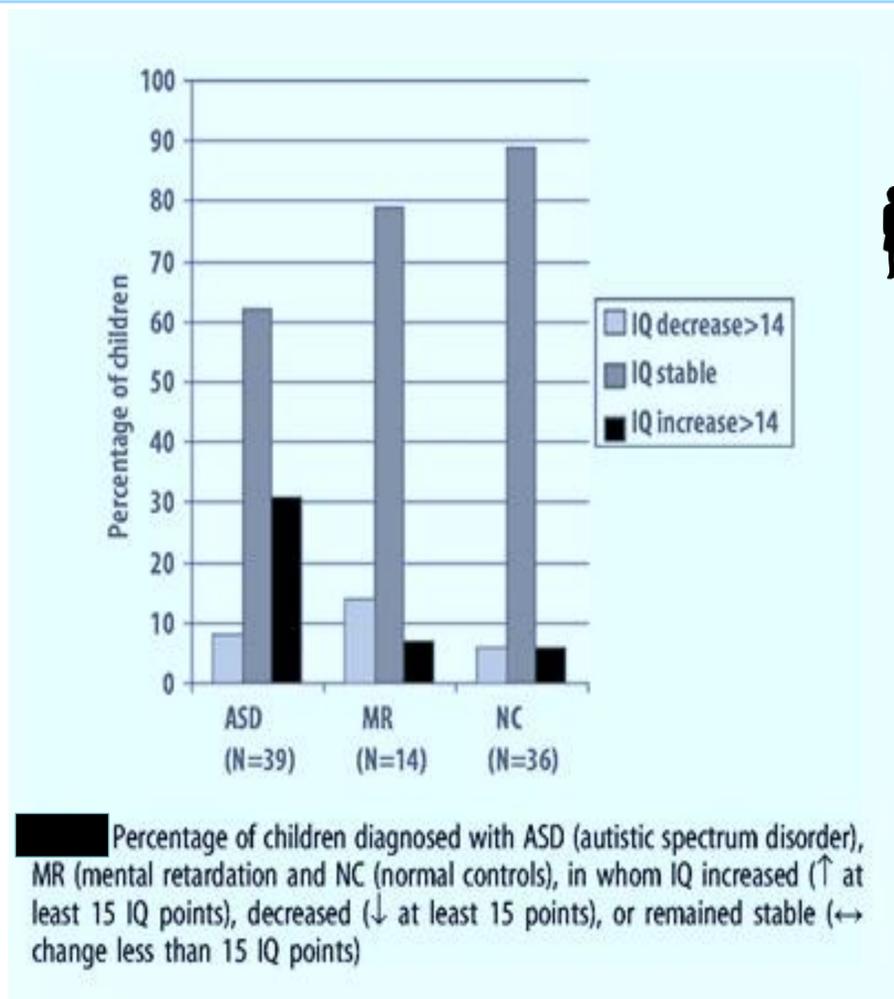
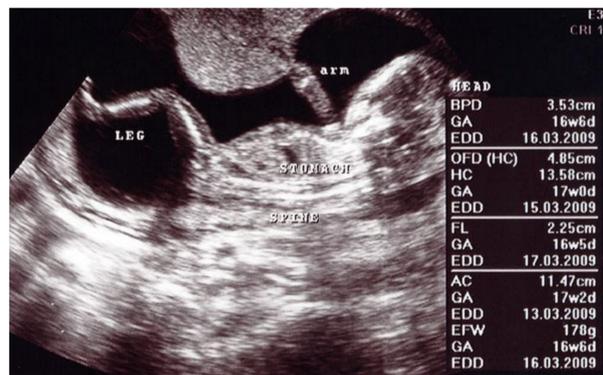
Autistic Spectrum Disorder

Autistic spectrum disorder is a neurodevelopmental disorder. Autistic spectrum disorder can be visualized by a lack of cognitive function including deficits in social skills, communication, and repetitive behaviors. The cerebellum controls cognitive function. Those with autistic spectrum disorder have abnormal cerebellar patterns, which explains why those with autistic spectrum disorder have deficits in cognitive function (See Chart 1). Researchers have matched certain genes and genetics to autistic spectrum disorder. This disorder is also caused by environmental factors if the predisposed genetics exist.

Prenatal Ultrasound

Prenatal ultrasound allows doctors to look at the fetus and potentially diagnose genetic defects (See Image 1). With autistic spectrum disorder, research shows that the fetus' head and bodies grow quicker in the beginning of the second trimester. This knowledge may allow the doctors and parents to prepare for the disorder. If parents learn their fetus has autistic spectrum disorder, they can begin to think about their options. Options may include, but are not limited to, special education programs and support groups they may want to join.

Image 1 – Image of a normal prenatal ultrasound showing head measurements.⁶



Percentage of children diagnosed with ASD (autistic spectrum disorder), MR (mental retardation) and NC (normal controls), in whom IQ increased (↑ at least 15 IQ points), decreased (↓ at least 15 IQ points), or remained stable (↔ change less than 15 IQ points)

Chart 1 – Graph demonstration of autistic spectrum disorder, mental retardation, and normal controls that had certain degrees of change to their IQ⁴

Results

Researchers have long known that the fetus is most fragile during the first trimester. It correlates, then, that the relationship between autistic spectrum disorder and prenatal ultrasound occurs in the first trimester. There is no correlation between autistic spectrum disorder and prenatal ultrasound in the second and third trimesters. Regardless of the number of outside triggers, a fetus can not get autistic spectrum disorder without a genetic predisposition to the disorder. The recent increase seen in autistic spectrum disorder and prenatal ultrasound may have to do with the increase in prenatal ultrasound scans done during the first trimester and continued throughout the pregnancy (See Image 2).

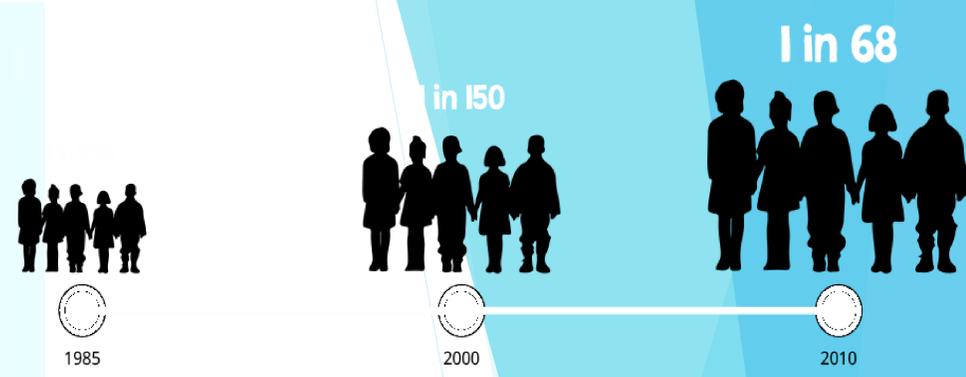


Image 2 – Illustration showing the increase in autistic spectrum disorder from 1985, 2000, and 2010.³

Conclusion

In certain circumstances, a child is born with autistic spectrum disorder and this may present itself if these children undergo certain environmental factors as a fetus. There has been a considerable amount of information discovered about this topic, but almost every resource concluded with the need for more research to be done. There is uncertainty about exactly when prenatal ultrasound has the strongest negative effect. There have been some environmental stressors discovered, but there may be more. With autistic spectrum disorder, there is still a lot of confusion as to why there is such a variance in symptoms. There are certain genes involved, but there may be more. There may be an exact time when these genes and outside stressors must interact. Even though prenatal ultrasound is extremely beneficial for early diagnosis, pregnancy dating, and viewing of the fetus, there is a need to be conscientious of the aggregate amount of prenatal ultrasound done on the fetus.

References

1. Abramowicz, J. S. (2013). Benefits and risks of ultrasound in pregnancy. *Seminars in Perinatology*, 33(5), 295-300. <https://doi.org/10.1053/j.semper.2013.06.004>
2. Abramowicz, J. S. (2016). *Ultrasound in the first trimester and earlier: How to keep it safe*. Retrieved from <https://link.springer.com/book/10.1007/978-3-319-20203-7>
3. Autism Biotech Ltd. (2010). Photograph. *Developing the world's first biochemical test for the early reliable diagnosis of autism*. Retrieved from <https://www.autism-biotech.com/>
4. Dietz, C., Swinkels, S., Buitelaar, J., Van Daalen, E., Van Engeland, H., (2017). Percentage of children diagnosed with ASD (autistic spectrum disorder), MR (mental retardation) and NC (normal controls), in whom IQ increased (↑ at least 15 IQ points), decreased (↓ at least 15 points), or remained stable (↔ change less than 15 IQ points). *Graph. European Child & Adolescent Psychiatry*, 16(6), 409. <https://doi.org/10.1007/s00787-007-0614-3>
5. Dhawan, N., Emerson, B., Popara, R., Lin, C., Rawji, A., Zeiden, R., ... Gupta, V. (2014). Are attributes of pregnancy and the delivery room experience related to development of autism? *International Scholarly Research Notices*, 2014(290837). <http://dx.doi.org/10.1155/2014/290837>
6. McClane, S. (2017). Seventeen Weeks Pregnant Symptoms, Ultrasound and Fetus Development. Photograph. *Pregnancy + Health*. Retrieved from <https://www.pregnancyhealth.net/17-weeks-pregnant-symptoms-ultrasound-fetus-development/>
7. Rogers, T. D., McKimm, E., Dickson, P. E., Goldowitz, D., Blaha, C. D., & Mittleman, G. (2013). Is autism a disease of the cerebellum? An integration of clinical and pre-clinical research. *Frontiers in Systems Neuroscience*, 7(15), 1-11. <https://doi.org/10.3389/fnsys.2013.00015>
8. Webb, S. J., Garrison, M. M., Bernier, R., McClintic, A. M., King, B. H., & Mourad, P. D. (2016). Severity of ASD symptoms and their correlation with the presence of copy number variations and exposure to first trimester ultrasound. *Autism Research*, 10(3), 472-484. <https://doi.org/10.1002/aur.1690>