

NEWS

Clinical research: Pupil size may signal autism

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The pupils of children with autism react to light more slowly and less efficiently than those of controls, according to a study published 18 December in the *Journal of Autism and Developmental Disorders*¹.

This sort of autonomic response — which reflects basic biological functions such as heart rate, and is easy to measure — may signal risk of autism and related disorders. The researchers see a similar effect in children with other neurological disorders.

Autism is diagnosed using behavioral measures, but people with the disorder also show physiological differences from controls. Researchers hope that some of these differences may become **biomarkers**, assisting with diagnosis and serving as endpoints for treatments.

Although many biomarker studies focus on **brain function**, alterations in the autonomic nervous system are also promising. Children with autism may have an elevated heart rate and larger pupils, and may react to stress more readily than controls do². A 2009 study found that their pupils are **slower to constrict** when exposed to light than are those of controls³.

The new study looked at pupillary reflex in 152 children with autism, 116 controls and 36 children with other neurological disorders, such as Down syndrome and **fragile X syndrome**. The researchers also measured heart rate to test whether alterations in pupil size match up with other measures of the autonomic nervous system.

Children with autism and those with other neurological disorders are all slower to constrict their pupils than controls are. They also constrict their pupils less and do so for a shorter period of time.

Children with autism have a faster heart rate than controls do, and the rate for those with other neurological disorders is faster still. For children with autism, but not the other two groups, a faster

heart rate accompanies slower pupil contraction. Medication use has no statistically significant effect on the pupillary reflex, the study found.

Typically developing children speed up their pupillary reflex between 6 and 8 years of age, the study found. The researchers did not see the same trend for children with autism, suggesting differences in brain development.

Children with other developmental disabilities also did not show a noticeable improvement in the reflex with age, but the small number of participants makes this result inconclusive, the researchers say.

References:

- 1: Daluwatte C. *et al. J. Autism Dev. Disord.* Epub ahead of print (2012) [PubMed](#)
- 2: Ming X. *et al. Brain Dev.* **27**, 509-516 (2005) [PubMed](#)
- 3: Fan X. *et al. J. Autism Dev. Disord.* **39**, 1499-1508 (2009) [PubMed](#)