autistica

Science in the Service of Autism

# Earlier signs of autism detected

Scientists have shown for the first time that measuring brain activity in infants as young as six months may help to predict the future development of autism symptoms.

Funded by the UK Medical Research Council and Autistica, the research was conducted at the Centre for Brain and Cognitive Development, Birkbeck, University of London and published in the 26 January issue of the Cell Press journal *Current Biology.*

In their first year of life, babies who will go on to develop autism already show different brain responses when someone looks at them or away. Although the researchers are careful to say that the study is only a first step toward earlier diagnosis, the findings do suggest that direct brain measures might help to predict the future development of autism symptoms in infants as young as six months.

"Our findings demonstrate for the first time that direct measures of brain functioning during the first year of life associate with a later diagnosis of autism - well before the emergence of behavioural symptoms," said Professor Mark Johnson, MRC Scientist and head of the Centre for Brain and Cognitive Development at Birkbeck, University of London.

The behaviours characteristic of autism emerge over the first few years of life and firm diagnoses are now made in children only after the age of two. As a result, the vast majority of research on autism has necessarily concentrated on children two and up, who have already been diagnosed.

"We still know very little about the earliest appearing symptoms and warning signs," Professor Johnson said.

To find out more, his team looked to six- to ten-month-old babies at greater risk of developing autism later in development because they had an older brother or sister with the condition. The researchers used passive sensors placed on the scalp to register brain activity while the babies viewed faces that switched from looking at them to looking away from them or vice versa.

Earlier studies have shown that the human brain shows characteristic patterns of activity in response to eye contact with another person. That response is a critical foundation for face-to-face social interactions and it is well known that older children diagnosed with autism show unusual patterns of eye contact and of brain responses to social interactions that involve eye contact.

The new studies reveal that the brains of infants who will go on to develop autism already process social information in a different way. "At this age, no behavioural markers of autism are yet evident, and so measurements of brain function may be a more sensitive indicator of risk," Johnson said.

It is important to note, however, that there were cases in which individual babies who showed these differences in brain function were not later diagnosed and vice versa. In other words, the method would require further refinement, most likely in combination with other factors, to form the basis of a predictor accurate enough for clinical use in the general population.

"Differences in the use of eye gaze to regulate social interaction are already a well-recognized early feature in many children with autism from the second year of life and at present it is these increasingly well-documented 'first signs' that will alert parents and professionals to possible differences," said Professor Tony Charman of the Centre for Research in Autism and Education (CRAE) at the Institute of Education, London, who co-led the study. "Future studies will be required to determine whether measurements of brain function such as those used in our study might one day play a role in helping to identify children at an even earlier age."

It will also be important to explore factors that might "protect" some infants who do show early differences in their brains' responses to eye contact from going on to a diagnosis of autism, he added.

**The research has been funded by UK Medical Research Council and the BASIS funding consortium led by Autistica, a charity seeking to fund biomedical research to bring benefits to individuals and families affected by autism spectrum disorders. Christine Swabey, CEO of Autistica, said:**

**"Autism currently affects 1% of the UK population and the hope is that this important research will lead to improved identification and access to services for future generations. Ultimately, the earlier we can identify autism and provide early intervention, the better the outcomes will be in later childhood and adult life."**

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**Autistica Chief Executive, Christine Swabey, talks about the findings on Radio 5, 31 January 2012.**
Listen to interview online.

**Notes to editors:**

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The full paper on this research was published on 26 January 2012 in the journal *Current Biology.* To view the full article please contact Elisabeth Lyons at Cell Press at elyons@cell.com or on +1 617 386 2121.

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**About Autistica:** Autistica was founded in 2004 by Dame Stephanie Shirley. Autistica seeks to fund biomedical research to bring benefits to individuals and families affected by autism spectrum disorders. Autistica is dedicated to supporting high-quality peer reviewed research which focuses on determining the causes and biological basis of autism spectrum disorders; improving diagnosis; and advancing and evaluating new treatments and interventions. The charity is committed to ensuring that increased understanding and new scientific knowledge will improve the quality of life for individuals on the autism spectrum. **www.autistica.org.uk**

In funding Professor Mark Johnson and the BASIS project at Birkbeck College, University of London, Autistica has led a consortium of funders including: The Henry Smith Charity; The Baily Thomas Charitable Fund; Charles Wolfson Charitable Trust; Mercers' Charitable Foundation; The David and Elaine Potter Foundation; Kirby Laing Foundation, The Mason le Page Charitable Trust.