Higher anxiety associated with poorer functioning in children with 22q11.2 deletion syndrome

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UC Davis researchers have found that for children with the genetic disorder known as chromosome 22q11.2 deletion syndrome anxiety—but not intelligence—is linked to poorer adaptive behaviors, such as self-care and communication skills, that affect daily life. The developmental syndrome, which is associated with a constellation of physical, cognitive and psychiatric problems, usually is apparent at birth or early childhood, and leads to lifelong challenges.

The study findings suggest that helping children cope with fear-based symptoms may be the best strategy for increasing independence and protecting against psychiatric problems later in life. The article, titled, "An examination of the relationship of anxiety and intelligence to adaptive functioning in children with chromosome 22q11.2 deletion syndrome," is published online today in the *Journal of Developmental and Behavioral Pediatrics*. It will appear in the December 2012 print issue of the journal.

"Our study confirmed our impressions from seeing patients with 22q deletion syndrome that those with more severe anxiety symptoms tend to be most impaired in their everyday functioning," said Kathleen Angkustsiri, lead study author and assistant professor of developmental and behavioral pediatrics with the UC Davis MIND Institute. "It highlights the critical importance of recognizing and treating anxiety in these very vulnerable children."

The disorder also is known as velocardiofacial syndrome, referring to some of the common physical anomalies associated with the disorder, as well as DiGeorge syndrome, after one of the first physicians to describe it. The currently preferred name of chromosome 22q11.2 deletion syndrome identifies the location on the twenty-second chromosome where a small piece of DNA is missing. It is inherited in an autosomal dominant fashion, meaning that the child of a parent with the syndrome has a 50 percent chance of developing the syndrome; however, in 90 to 95 percent of cases, no family history of the syndrome is known, and the mutation arises for the first time in the affected person. The syndrome is estimated to affect about 1 in 2,000-4,000 people, making it the second most common condition after Down syndrome, another genetically based developmental disorder.

Manifestations of the syndrome vary among affected individuals. It may be diagnosed soon after birth because of symptoms related to heart defects as well as anomalies of the mouth, palate and throat, affecting feeding, speech and facial structure. Children with 22q11.2 deletion syndrome have a high prevalence of mental-health disorders such as anxiety and attention deficit hyperactivity disorder (ADHD), and IQs usually are in the borderline-to-low range. In early adulthood, about 30 percent may develop a psychiatric disorder such as schizophrenia.

The study evaluated 78 children with the syndrome, ages seven to 15 years, with a battery of standardized tests related to behavior, anxiety, adaptive functioning and intelligence. Thirty-six typically developing children with no known genetic syndromes were also evaluated for comparison. Assessment involved neuropsychological testing and developmental-behavioral pediatric evaluation of the children as well as parent questionnaires about their child's symptoms.

Mean anxiety scores were found to be significantly higher in children with 22q11.2 deletion syndrome than in typically developing children.

Fifty-eight percent of children with the syndrome were found to have at least one elevated anxiety score, although only 19 percent had previously been diagnosed with an anxiety disorder.

In addition, higher anxiety scores correlated with lower adaptive function among children with the syndrome. Adaptive functioning is a measure of age-appropriate everyday living skills surrounding self-care, home and school living, communication and other factors. Specific anxiety subscales that were associated with poorer adaptive behavior included panic-agoraphobia (anxiety associated with unfamiliar environments), physical injury and obsessive-compulsive disorder.

"Anxiety appears to be under-identified by health-care professionals despite known elevated risk in this population," Angkustsiri said. "It is possible that more aggressively recognizing and treating anxiety in these children will prevent more severe problems as they enter adulthood."

For reasons that are not well understood, children with 22q11.2 deletion syndrome have a high risk of developing schizophrenia as they reach adulthood. In the general population, anxiety disorders also are associated with schizophrenia.

No relationship was found in the study between IQ and adaptive skills in children with 22q11.2 deletion syndrome, although an association was found in typically developing children and has been found in other studies of children with developmental disorders. The study authors postulate that the lack of correlation in 22q11.2 deletion syndrome could be explained by anxiety, so that because of fearfulness, children do not attain the maximal adaptive functional skills one might expect given their intellectual potential. In addition, children may not be reaching their optimal learning potential because of being distracted by worries or compulsions during learning opportunities.

The good news is that we have many good interventions to treat anxiety, such as medications and counseling, while cognitive impairments are not as amenable to treatment," said Angkustsiri. "We are hopeful that targeting anxiety can make a difference for children with this disorder, as well as in other vulnerable children."

The researchers are further studying factors that contribute to children with 22q11.2 deletion syndrome either being a "struggler" (characterized by high anxiety and low adaptive functioning) or someone who is coping—a "coper"—as well as interventions that may help the strugglers to become copers.

"This study provides an important key to significantly helping children with 22q deletion syndrome cope better with everyday life and improve their outcomes," said Tony J. Simon, principal investigator of the study and professor of psychiatry and behavioral sciences at UC Davis and the MIND Institute.

"The effects of anxiety should not be underestimated, and physicians caring for children with special needs should be proactive in diagnosing and treating it."

The team recently has started the "22q Healthy Minds Clinic" in order to put this research into practice. A team including a developmental-behavioral pediatrician or child psychiatrist, child psychologist, and cognitive neuroscientist evalutes children with 22q11.2 deletion syndrome and provides recommentations for intervention. For more information about referrals to the clinic, click here, or email cabil@ucdmc.ucdavis.edu and specifiy that you are interested in the 221q Healthy Minds clinic.

Provided by UC Davis