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**Mood, Anxiety Disorders Common in Tourette Patients, Emerge at a Young Age
*Obsessive-Compulsive Disorder, ADHD Are Shown To Be Risk Factors For Additional
Psychiatric Disorders In Largest Study To Date***

A new study of Tourette syndrome (TS) led by researchers from UC San Francisco and Massachusetts General Hospital (MGH) has found that nearly 86 percent of patients who seek treatment for TS will be diagnosed with a second psychiatric disorder during their lifetimes, and that nearly 58 percent will receive two or more such diagnoses.

It has long been known that TS, which emerges in childhood and is characterized by troublesome motor and vocal tics, is often accompanied by other disorders, especially attention-deficit hyperactivity disorder (ADHD) and obsessive-compulsive disorder (OCD). In many patients these “comorbid” conditions cause more distress and disability for patients than TS tics themselves.

But the size and rigor of the new study, conducted by an international group of researchers known as the Tourette Syndrome Association International Consortium for Genetics (TSAICG) and published in the February 11, 2015 online edition of *JAMA Psychiatry*, provides the most comprehensive and reliable picture of TS comorbidities to date, said Carol A. Mathews, MD, professor of psychiatry at UCSF and co-senior author of the new report.

“This is the biggest data set of its kind that I know of,” Mathews said. “We’ve interviewed thousands of people and collected a huge wealth of clinical data, which has given us the opportunity to say something meaningful about the clinical presentation of Tourette syndrome.”

Co-senior author Jeremiah Scharf, MD, PhD, of the MGH Psychiatric and Neurodevelopmental Genetics Unit (PNGU), an assistant professor of neurology at Harvard Medical School and TSAICG co-chair, said that the new findings should prove useful to his fellow neurologists, who often treat TS patients but may not be aware of the full spectrum of possible psychiatric comorbidities seen in the disorder.

“The origin of TS is in a part of the brain that is the overlap between neurology and psychiatry,” said Scharf. “Knowing the range of diagnostic possibilities and forming collaborative teams with psychiatrists is important to successfully treat TS.”

Led by first authors Matthew E. Hirschtritt, MD, MPH, a psychiatry resident at UCSF, and Paul C. Lee, MD, MPH, a former postdoctoral fellow at the MGH PNGU, the researchers analyzed diagnostic data for more than 1,300 TS patients gathered in consistent, highly structured interviews completed over the 16-year period from 1992 to 2008. In addition, to determine how comorbid conditions that are frequently seen in TS patients might run in families, the analysis also included diagnostic information from parents, siblings, and other relatives unaffected by TS.

As expected, the report found that ADHD and OCD are common among those with TS. Seventy-two percent of the TS patients studied received one of these two diagnoses, and nearly one-third were diagnosed with both ADHD and OCD. ADHD was seen to emerge as early as age 5 in TS patients, and OCD before 10 years of age.

But the results also show that mood disorders, anxiety disorders, and disruptive behavior disorders are quite common in TS patients—about 30 percent of patients received one of these diagnoses—and that mood and anxiety disorders appear much earlier in life in TS patients than is typical in the general population.

“Anxiety and depression, which in the general population often emerge in adolescence and adulthood, are more likely to emerge early in life with TS, sometimes as early as age 5,” said Scharf. “Social anxiety and ADHD often start in TS patients before tics even arise, which emphasizes the importance of screening young patients for these conditions.”

Moreover, the researchers found that the risk of mood and anxiety disorders is related to OCD and ADHD diagnoses: both mood and anxiety disorders are significantly more common in TS patients with a concomitant diagnosis of OCD or of combined OCD and ADHD.

These observations are presumably a consequence of intertwined genetic relationships between these conditions, said Mathews. “We found that, while OCD and ADHD directly shared genetic relationships with TS, the other psychiatric disorders, such as mood and anxiety disorders, appear to share genetic relationships with ADHD and/or OCD, but not directly with TS. Perhaps of more relevance for clinicians, parental history of ADHD—but not tics or OCD—is associated with a nearly two-fold increase in the risk of having more than one co-occurring psychiatric disorder.”

The researchers found relatively low rates of other psychiatric conditions, including eating disorders, psychosis, and substance abuse, among TS patients.

Mathews and Scharf cautioned that their results are potentially skewed because many TS patients never seek medical attention for the disorder. “This is a somewhat biased sample, because the patients we studied came to a clinic or through the Tourette Syndrome Association. People who come to a clinic for treatment tend to have more severe TS or they have other psychiatric symptoms,” said Mathews. “But this work still gives clinicians a good idea of what they should be on the lookout for.”

The research was funded by the Tourette Syndrome Association (TSA), the National Institute of Neurological Disorders and Stroke, the National Institute of Mental Health, a TSA Research Fellowship to Lee, and a Doris Duke Clinical Research Fellowship to Hirschtritt.

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Massachusetts General Hospital, founded in 1811, is the original and largest teaching hospital of Harvard Medical School. The MGH conducts the largest hospital-based research program in the United States, with an annual research budget of more than \$760 million and major research centers in AIDS, cardiovascular research, cancer, computational and integrative biology, cutaneous biology, human genetics, medical imaging, neurodegenerative disorders, regenerative medicine, reproductive biology, systems biology, transplantation biology and photomedicine.