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Highlights...

In the page 1 stories in this issue, an expert in tic disorders describes what you need to know to assess and treat these conditions; we also look at ways in which some children may be self-medicating hypersensitivity with substances.



Keep Your Eye On... See page 2

- The increased use of e-cigarettes by teens
- The use of bumetanide in treating ASD symptoms

What's New in Research... See pages 3-5

- Marijuana use by youth, schizophrenia genetic risk examined
- Experts: Treat co-occurring SUDs and mental illness in teens concurrently

Editor's Commentary

- Mental health professionals adapt to the electronic health record
— By Gregory K. Fritz, M.D.

See page 8



Free Parent Handout...



**When you get the
diagnosis: ADHD
primer for parents**

CABL

Tic Disorders

A primer for the treatment of tic disorders in youth

By Robert R. Selles and Jennifer B. Freeman, Ph.D.

Tic disorders commonly occur among youth and are characterized by the presence of sudden and repetitive body movements and/or vocalizations. Tics range in location (e.g., face, legs) and complexity (e.g., eye blinks, humming, multistep movements, phrases). Typically, tics onset early in childhood (i.e., ages 5–8), peak in severity and prevalence in preadolescence (i.e., ages 10–12), and begin to decline during adolescence. Only a small percentage of youth (around 20%) continue to have moderate or severe tics in adulthood.

Treatment of a child with tics should begin with a thorough assessment, including differential diagnosis from stereotypes, compulsive behaviors, or other movement disorders (see Scahill et al., 2006, and Murphy et al., 2013, for a detailed guide). In the case that symptoms are identified

as tics, use of evidence-based assessment measures (see McGuire et al., 2012, for a review), including the clinician-rated Yale Global Tic Severity Scale (Leckman et al., 1989), is helpful in establishing a clinical picture of the tics. Knowledge of the number, frequency, intensity, complexity, and interference of tics, as well as the extent of impairment specific to tics, will be useful for informing treatment decisions. In addition, in youth with tic disorders, clinicians should assess for comorbid conditions, such as attention-deficit hyperactivity disorder (ADHD), obsessive compulsive disorder (OCD), anxiety, and depressive disorders, as these conditions frequently co-occur and are often associated with greater functional impairment than the tics.

See *Tic Disorders*, page 6...

Substance Use Disorders

Teens with SUDs are hypersensitive to aversive stimuli; may lead to relapse

By Alison Knopf

Researchers have found that when adolescents with substance use disorders (SUDs) have a negative visceral sensation — in this case, a limited ability to draw a deep breath — their brain response is more exaggerated than in healthy teens, who are better able to prepare for the negative sensation. This association means that SUDs could make teens hypersensitive to aversive stimuli, or that this hypersensitivity is innate and they are trying to medicate it with substances, or both.

Study details

The cross-sectional, experimental study was done with 18 adolescents ages 15–17 with an alcohol or marijuana SUD, and 15 healthy controls. Subjects were recruited by flier from local high schools.

Subjects had never had a psychiatric disorder independent of SUD, were not currently using psychoactive medications, had no history of major medical disorder or head trauma, were right-handed, and

See *Substance Use Disorders*, page 7...

Tic Disorders

From page 1

Once appropriately assessed, provision of psychoeducation regarding tics is recommended as a first treatment step. At a minimum, patients should be provided with information on the nature of tics (e.g., etiology, course, prognosis, presentations) and their options for treatment; however, identification/development of basic coping strategies (e.g., tic acceptance; strategies for talking about tics with others) as well as a discussion around obtaining accommodations for school/activities (e.g., extra time, permission to leave the classroom) should also be included. This information is beneficial, as it can reduce misunderstanding and stigma surrounding tics and has been shown to help alleviate tic-related emotional consequences. For youth with mild tics (i.e., minimally invasive, noticeable and/or bothersome), this brief information, followed up with symptom monitoring, is likely sufficient, given that in the majority of youth the natural course of tics is to decline during adolescence.

Focus on impairment

As is generally true, intervention decisions should focus on addressing the most functionally impairing symptoms in youth. Due to the high rates of comorbidity in youth with tics, in many cases this will not be the tics themselves. In these cases, clinicians should use appropriate interventions for the primary concern but may benefit from considering treatments that could potentially address both concerns, such as α -2 agonists for primary ADHD, or exposure and response prevention for primary OCD.

In youth where tics represent the primary concern, typically in cases where tics are in the moderate (i.e., relatively cumbersome, invasive, noticeable, orchestrated and/or time-consuming, and distressing) or severe range (e.g., highly complex, time-consuming, physically injurious, socially inappropriate, and significantly distressing), direct intervention is recommended. Behavioral treatments, specifically habit reversal training (HRT), which employs awareness training/self-monitoring and the use of competing responses to resist tic completion, and comprehensive behavioral intervention for tics (CBIT), which incorporates psychoeducation, HRT, and other

behavioral techniques (e.g., functional analysis, relaxation), have been found to be efficacious and safe in reducing tic severity and tic-related impairment in youth with tics. As a result, these treatments are recommended as a first-line option for youth with moderate and severe tics.

Pharmacological interventions

Occasionally, high tic severity/impairment necessitates pharmacological, in addition to psychosocial, intervention. In these cases, the most appropriate agent is selected in an attempt to balance evidence for efficacy, necessity for improvement given the patient's severity, the risk of adverse events, comorbid conditions, and patient characteristics. At this time, evidence exists for three general classes of pharmaceutical intervention, specifically: α -2 agonists (e.g., clonidine, guanfacine), atypical antipsychotics (e.g., risperidone, aripiprazole), and typical antipsychotics (e.g., haloperidol, pimozide).

Shown to be efficacious, relatively tolerable, and safe, α -2 agonists are recommended as a first-line medication in tic-disordered youth with comorbid ADHD.

For youth without comorbid ADHD, it is less clear that α -2 agonists have meaningful benefit in the treatment of tics; however, if children have personal characteristics that contraindicate the use of antipsychotics (e.g., obesity), a trial of α -2 agonists may still be advisable. If not, atypical antipsychotics are the second-line medication option. In particular, risperidone has the largest body of empirical support and, while still associated with a number of serious side effects, is better tolerated than typical antipsychotics. Aripiprazole may be comparably efficacious and generally more tolerable than risperidone, although research is more preliminary. Failing improvement with the above interventions, typical antipsychotics pimozide and haloperidol, which are empirically supported but associated with the risk of severe side effects, are considered as third-line treatment options for youth with tics.

Limitations

The review and recommendations provided above are limited by the brief nature of this publication. As a result, clinicians are directed to a number of more lengthy reviews and guidelines for more specific and detailed information, including specifics on differential diagnosis, additional

assessment tools, specific treatment studies, treatment components and implementation, dosing recommendations, and adverse effect profiles.

In particular, readers may look to the Practice Parameter for the Assessment and Treatment of Children and Adolescents With Tic Disorders (Murphy et al., 2013), the European guidelines for treatment (Roessner et al., 2011; Verdellen et al., 2011), and the Canadian guidelines for treatment (Pringsheim et al., 2012; Steeves et al., 2012), as well as a number of other reviews (e.g., Parraga et al., 2010; Selles et al., 2013; Weisman et al., 2013) for additional information.



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Substance Use Disorders

From page 1

had not been exposed to prenatal alcohol or drugs. For the SUD subjects, 27% had a current primary alcohol use disorder and 73% a current primary marijuana use disorder. Controls had limited lifetime alcohol or marijuana use and no other subject use. Each subject was paid \$180 for participation.

The study required anticipation of, via a signal, and experience of an aversive interoceptive stimulus, which in this case was the breathing-load stimulus. Subjects wore a nose clip and breathed through a mouthpiece that had a valve that prevented breathing. The mouthpiece was connected to an inspiratory resistance load, which could limit the airflow through the breathing tube attached to the mouthpiece. When it's difficult to breathe in, the subject experiences discomfort. The breathing valve was closed after a signal was given that this would happen.

The subjects' fMRI was recording during the breathing load cue and the breathing load itself. There were three conditions: baseline, in which the task was performed with a blue indicator, meaning there would be no breathing load; anticipation, in which the task was performed with a yellow indicator, meaning there was a 25% chance of a breathing load; and breathing load, in which the subject experienced 40 seconds of loaded breathing. Response accuracy in the task was measured, along with reaction time.

Results

All subjects had greater activation in the bilateral anterior and posterior insula, the part of the brain that connects the mind and body, during activation than anticipation. However, subjects with SUDs had far greater activation during breathing load than during anticipation, compared with controls, who had greater activation during anticipation than breathing load in the left posterior insula.

The researchers had expected that teens with SUDs would have greater breathing-load activation than controls in the insula. And finally, the teens with SUDs rated the breathing load as more unpleasant than the controls rated it.

The results are consistent with other research showing that adolescents with SUDs also have heightened sensitivity to pleasant stimuli — such as a light stroke on the arm. In this research, published previously by the same group, there was increased reward processing.

Teens with SUDs may not be able to predict physiological bodily changes, the researchers said. "Addiction may present a chronic imbalance of a homeostatic condition of the body, leading to maladaptive regulation of the internal state through substances," they wrote. In addition, they note that drug-seeking in people with addiction is also caused by the negative bodily experience of withdrawal, which reinforces drug-seeking in a constant vicious cycle.

Preventing relapse

Corresponding author Susan F. Tapert, Ph.D., professor of psychiatry at the University of California, San Diego, explained that the aversive stimulus is not the same as stress. "Interoceptive functioning involves our visceral reactions to things, like a gut feeling," she told *CABL*. "We don't want to measure the pain response system or the stress response system, but something that is a little bit more subtle," she said. "The idea is to map onto different situations that can escalate someone's substance use, or, in someone in recovery, precipitate a relapse."

The healthy teens in the study seemed to be more in touch with their physical responses, she said. "The healthy teens knew what was coming and prepared for it," she said. For the teens with SUDs, "there was a little bit of 'Oh no, that thing is coming again'" seen on the fMRI, but it was "modest," she said. "There was much more activation during the unpleasant time than during anticipation" in teens

with SUDs, she said. "But healthy teenagers brace for this unpleasant thing, and then there's not as much activation when it's actually happening."

The insula acts to connect the brain and body, said Tapert. "If you think of the system as homeostatic, it could be that some teens are more inclined to use alcohol and other drugs to balance it out," she said. "We don't know yet whether the hypersensitivity is in kids who had a characteristic that predated SUDs, or whether it's due to the drug effects."

"This study and our other studies suggest that substance-using youth may be more reactive," said Tapert. "Their brains are set up to be more reactive to both pleasant and unpleasant situations, including bodily states, feeling under the weather or feeling excited about something." This hypersensitivity itself may make them inclined to use substances to "even out and regulate their state of mind," she said.

As a clinician, Tapert wants to help adolescents be able to understand how they're feeling, she said, noting that this can ward off using substances for regulating emotions. "I want them to be able to state out loud, 'I am feeling nervous, I'm not feeling well right now,' and to think of some other ways to feel better without using substances," she said.

Limitations

The study was limited by the small sample size, and by the lack of other kinds of substances in addition to alcohol and marijuana. Still, the study did suggest that adolescents with SUDs are hypersensitive to aversive stimuli, which may lead them to seek drugs.



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The authors reported no conflicts of interest.

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