PET Scan Predicts Response to Psychotherapy, Medication

Pretreatment scans of brain activity predicted whether depressed patients would best achieve remission with an antidepressant medication or psychotherapy, according to a study funded by the National Institutes of Health and published in JAMA Psychiatry.

Currently, determining whether a particular patient with depression would best respond to psychotherapy or medication is based on trial and error. In the absence of any objective guidance that could predict improvement, clinicians typically try a treatment that they, or the patient, prefer for 1 to 2 months to see if it works. Consequently, only approximately 40% of patients achieve remission following initial treatment.

The study team hoped to identify a biomarker that could predict which type of treatment a patient would benefit from based on the state of his or her brain. Using a positron emission tomography (PET) scanner, they imaged pretreatment resting brain activity in 63 depressed patients. They compared brain circuit activity of patients who achieved remission following treatment with those who did not improve.

Activity in one specific brain area emerged as a pivotal predictor of outcomes from two standard forms of depression treatment: cognitive-behavioral therapy (CBT) or the selective serotonin specific reuptake inhibitor escitalopram (Lexapro®). If a patient's pretreatment resting brain activity was low in the insula, it signaled a significantly higher likelihood of remission with CBT and a poor response to escitalopram. Conversely, hyperactivity in the insula predicted remission with escitalopram and a poor response to CBT.

Among several sites of brain activity related to outcome, activity in the anterior insula best predicted response and nonresponse to both treatments. Changes in insula activity have been observed in studies of various depression treatments, including medication, mindfulness training, vagal nerve stimulation, and deep brain stimulation.


Childhood Abuse Linked with Food Addiction in Adult Women

Women who experienced severe physical or sexual abuse during childhood are much more likely to have a food addiction as adults than women who did not experience such abuse, according to a new study published in Obesity. The study’s findings provide valuable new information regarding potential causes and treatments for food addiction and obesity.

Previous research shows that childhood abuse has consequences not only for women’s mental health but also for their physical health. In particular, many studies have documented a link between childhood abuse and later obesity, possibly because stress may cause one to overeat high-sugar and high-fat “comfort” foods in an uncontrolled manner.

Because of these findings, the study team looked for a link between childhood abuse and addiction-like eating behaviors in women. The researchers studied 57,321 adult participants in the Nurses’ Health Study II, which ascertained physical and sexual child abuse histories in 2001 and current food addiction in 2009. (Food addiction was defined as three or more addiction-like eating behaviors severe enough to cause significant distress or loss of function.)

The analysis revealed that addiction-like eating behaviors were relatively common among women in the study, with 8% meeting the criteria for food addiction. Women who had experienced physical or sexual abuse before age 18 were almost twice as likely to have a food addiction in middle adulthood compared with women without a history of childhood abuse. The likelihood of food addiction was increased even further for women who had experienced both physical and sexual abuse in childhood. The food addiction prevalence varied from 6% among women without a history of physical or sexual abuse to 16% among women with a history of both severe physical and sexual abuse. Also, women with a food addiction were generally heavier than women without a food addiction.

**Review of Data Reveals Ideal Exercise Prescription for MDD**

Exercise has been shown to be an effective treatment for major depressive disorder (MDD), both when used alone and in combination with other treatments. According to a report in the *Journal of Psychiatric Practice*, sufficient research data now exist to provide specific guidance on how to prescribe exercise for depressed patients.

Based on the available data, aerobic exercise is the preferred form of exercise for patients with MDD—although there is also support for resistance training, the study authors noted. In terms of session frequency and duration, they recommend that patients participate in three to five exercise sessions per week, for 45 to 60 minutes per session.

In terms of intensity, for aerobic exercise, they recommend achieving a heart rate that is 50% to 85% of the individual’s maximum heart rate. For resistance training, they recommend a variety of upper- and lower-body exercises, three sets of eight repetitions at 80% of 1 repetition maximum (i.e., 80% of the maximum weight the person can lift one time).

Data suggest that patients may experience improvement in depressive symptoms as little as 4 weeks after starting exercise. However, the study authors emphasize that the exercise program should be continued for at least 10 to 12 weeks to achieve the greatest antidepressant effect.

Some people have questioned whether patients with MDD will be willing to participate in an exercise program. However, in the studies reviewed, only approximately 15% of patients dropped out of exercise programs—comparable to dropout rates in studies of medications and psychotherapy.

The authors discuss strategies that may help improve adherence to exercise programs, such as consulting patients about their preferred types of exercise and providing individualized educational materials and feedback.

They also provide some practical tips for clinicians on how to estimate exercise intensity using readily available information. See Lesley et al.’s article in this issue for a detailed look at a program introducing physical fitness to individuals with serious mental illness.


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**Guide to SBIRT Implementation Now Available**

The Substance Abuse and Mental Health Services Administration’s Technical Assistance Publication (TAP) 33 is now available. *Systems-Level Implementation of Screening, Brief Intervention, and Referral to Treatment* describes core elements of screening, brief intervention, and referral to treatment (SBIRT) programs for people with or at risk for substance use disorders. The TAP also covers SBIRT services implementation. TAP 33 provides general administrative and managerial information for SBIRT services, including effectiveness, implementation models, challenges and barriers to implementation, and cost and sustainability.

TAPs are compilations from various federal, state, programmatic, and clinical sources that provide practical guidance and information related to the delivery of treatment services to individuals with behavioral health needs. TAP 33 can be downloaded from http://store.samhsa.gov/shin/content/SMA13-4741/TAP33.pdf. Keep an eye on the *Journal of Psychosocial Nursing and Mental Health Services*; the article “Screening, Brief Intervention, and Referral to Treatment: Overview of and Student Satisfaction with an Undergraduate Addiction Training Program for Nurses” by Mitchell et al. will be published in an upcoming issue and is now available as an Online Advanced Release article at http://www.healio.com/journals/jpn/m/oar.


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**Likelihood of ADHD Significant in Children with Autism**

In a study of the co-occurrence of attention-deficit/hyperactivity disorder (ADHD) and autism spectrum disorder (ASD) in early school-age children (ages 4 to 8), researchers at the Kennedy Krieger Institute found that nearly one third of children with ASD also have clinically significant ADHD symptoms. Published in *Autism*, the study also found that children with both ASD and ADHD are significantly more impaired on measures of cognitive, social, and adaptive functioning compared to children with ASD only.

Distinct from existing research, the current study offers novel insights because most of the children entered the study as infants or toddlers, well before ADHD is typically diagnosed. Previous studies on the co-occurrence of ASD and ADHD are based on patients seeking care from clinics, making them biased toward having more...
multifaceted or severe impairments. By recruiting patients as infants or toddlers, the likelihood of bias in the current study is significantly reduced.

Participants in this prospective, longitudinal child development study included 162 children. Researchers divided the children into ASD and non-ASD groups. The groups were further categorized by ADHD classification according to parent-reported symptoms of ADHD on the Hyperactivity and Attention Problems subscales of the Behavioral Assessment System for Children-Second Edition.

Results revealed that, of 63 children with ASD in the study, 18 (29%) were rated by their parents as having clinically significant symptoms of ADHD. Importantly, the age range for children in the study represented a younger and narrower sample than has been previously reported in published literature.

Researchers also found that early school-age children with co-occurrence of ASD and ADHD were significantly more impaired than children with only ASD on measures of cognitive and social functioning, as well as in the ability to function in everyday situations. They were also more likely to have significant cognitive delays (61% versus 25%) and display more severe autism mannerisms, such as stereotypical and repetitive behaviors. The study findings suggest that children with the combined presence of ADHD and ASD may need different treatment methods or intensities than those with ASD only to achieve better outcomes.


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Body Clocks in Depressed Patients May be Broken

New research has shed light on altered circadian rhythms in the brain of people with depression, showing that they operate out of sync with the usual ingrained daily cycle. The findings were published in the Proceedings of the National Academy of Sciences. This research also reveals a previously unknown daily rhythm to the activity of many genes across many areas of the brain—expanding the sense that our master clock is crucial.

In a normal brain, the pattern of gene activity at a given time of the day is so distinctive that the authors could use it to accurately estimate the hour of death of the brain donor, suggesting that studying this “stopped clock” could conceivably be useful in forensics. By contrast, in severely depressed patients, the circadian clock was so disrupted that a patient’s “day” pattern of gene activity could look like a “night” pattern and vice versa.

The team uses material from donated brains obtained shortly after death, along with extensive clinical information about the individual. They looked at 12,000 gene transcripts isolated from six regions of 55 brains from people who did not have depression. This provided a detailed understanding of how gene activity varied throughout the day in the brain regions studied. But when the team tried to do the same in the brains of 34 depressed individuals, the gene activity was off by hours. The cells looked as if it were an entirely different time of day.

Now, the lead author adds, scientists must use this information to help find new ways to predict depression, fine-tune treatment for each depressed patient, and even find new medications or other types of treatment to develop and test. One possibility, she notes, could be to identify biomarkers for depression.

The team continues to mine their data for new findings and to probe additional brains as they are donated and dissected. The high quality of the brains—and the data gathered about how their donors lived and died—is essential to the project. Even the pH level of the tissue, which can be affected by the dying process and the time between death and freezing tissue for research, can affect the results. The team also will have access to blood and hair samples from new donors.