

A New Therapeutic Option for Behavioral Disorders

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“Hormone tests may become unique biomarkers in assessing behavioral and psychiatric disorders in children, adolescents, and adults.”

Attention-deficit/hyperactivity disorder (ADHD) is the most common type of behavioral disorder, affecting approximately 3-10% of children and adolescents aged 18 and younger.¹⁻³ Prevalence usually declines with age, but up to 65% of hyperactive children are still symptomatic as adults. ADHD's frequency in adults is estimated to be 2-7% of the population.⁴ The ADHD male:female ratio ranges from 2:1 to 9:1, according to different studies.⁵ In the last few years, scientists have noted an increasing rate of ADHD among girls.⁶

ADHD is a complex psychiatric disorder characterized by limited attention span, impulsivity, and overactivity.⁷ The three types of ADHD are characterized as predominantly inattentive, predominantly hyperactive-impulsive, and combined.⁴ Hyperactivity usually subsides in adolescence, but inattention and impulsivity often increase with age. In short, ADHD can be a serious disability with long-term consequences.

Despite the large number of ADHD studies, the precise causes of the disorder remain unknown. Genetic and environmental factors can play a significant role in ADHD's development.^{8,9} Most studies on environmental factors have found an

association with ADHD, but no clear evidence that these influences cause the disorder.¹⁰

Many questions remain regarding the best treatment practices for ADHD. Treatment usually includes parental education, appropriate school placement, and pharmaceutical agents. Psychostimulants are a general treatment option, and drugs such as antidepressants and alpha-adrenergic agonists can also be used. These medications, however, demonstrate limited effectiveness and may have undesirable side effects.

Many children and adults with ADHD also experience other psychiatric conditions. Comorbidity (having two or more diagnoses at the same time) between ADHD and social anxiety disorder is not unusual, occurring in about 25% of cases.^{4,11} Social anxiety disorder is the third most common mental health disorder, affecting approximately 10 million Americans.¹² Patients with social anxiety disorder usually fear social situations and experience serious emotional stress in circumstances such as being the center of attention, meeting with important people, and romantic relationships. Lack of normal self-esteem can lead to feelings of inadequacy, poor quality of life, and depression. To date, no specific

cause of this condition has been found. Two types of treatment are available for social anxiety disorder: medications such as antidepressants and beta-blockers, and "talk therapy" (psychotherapy). Currently available therapies for both conditions are of limited effectiveness, and innovative therapies for these mental disorders are sorely needed.

In this case report, we describe a young man with ADHD and social anxiety disorder. The patient was assessed using blood testing and was successfully treated using hormone restoration therapy.

Background

A 24-year-old white male presented with a combination of ADHD and social anxiety disorder during his initial visit in December 2002. At the time, he complained of severe fatigue, very low energy level, "major" depression, severe anxiety, decreased appetite, poor libido, bad short-term memory, sleeping problems, frequent sinus infections, and sore throat. The patient said he lacked motivation and could not control his emotions. Any social situation usually sent his heart "racing," increased sweating, and made his face red. He did not exercise due to his low energy level.

The patient had been diagnosed with ADHD around the age of seven and with social anxiety disorder at the age of 14. He was taking the antidepressant Paxil® daily and also had been using the stimulant drug Ritalin® for several years. In the previous decade, he had used numerous antidepressants. His vital signs were as follows: height, 5'8"; weight, 178 pounds; body fat percentage, 23% (normal range: 14-20%); blood pressure, 110/74 mmHg; pulse, 60 beats/minute.

Diagnosis and Treatment

Our clinical experience suggested that his conditions and related clinical symptoms might be related to neuroendocrine perturbations. Initial blood testing yielded the following results:

DHEA-S	Pregnenolone	Total testosterone	Total cholesterol	Reference range
(280-640 ug/dL)	(10-200 ng/dL)	(241-827 ng/dL)	(<200 mg/dL)	
79	56	678	195	Patient's result

The patient's levels of the basic hormones pregnenolone and dehydroepiandrosterone sulfate (DHEA-S) were low, with a significantly diminished DHEA-S level.

We initiated a program focused on correcting hormone imbalances and related symptoms, with the following recommendations:

- pregnenolone: 100 mg in the morning
- DHEA: 100 mg in the morning
- 7-keto DHEA: 70 mg in the morning
- androstenedione: 50 mg, 30 minutes before exercise for two months
- *Tribulus terrestris*: two tablets chewed in the morning
- vitamin E: 800 IU in the morning
- Nutribiotic® MetaRest® (containing 3 mg of melatonin, 250 mg of kava root extract, and 10 mg of vitamin B6 per capsule): one capsule at bedtime
- zinc: 60 mg at bedtime
- Alacer CMA™ Calcium-Magnesium Ascorbate (containing 1860 mg of vitamin C as mineral ascorbates, 100 mg of calcium, 40 mg of magnesium, 10 mg of vitamin B6, and 72 mg of magnesium citrate per two tablets): two tablets at bedtime.

After two months of treatment, the patient returned to the clinic with no medical complaints. His energy level was greatly improved,

and he had started to exercise four or five days a week. He discontinued use of Paxil® during his first two weeks on the program. He said that his ADHD and social anxiety disorder were no longer a factor. Additionally, he experienced no problems with restlessness, inconsistent performance, inability to focus, or memory.

We suggested that the patient discontinue use of androstenedione, *Tribulus terrestris*, MetaRest®, and CMA™, and decrease the daily dosages of DHEA to 50 mg, zinc to 30 mg, and vitamin E to 400 IU. At this time, we recommended Longevity Science® MagnaCalm (containing 420 mg of magnesium citrate per scoop): one-half scoop before bedtime. The patient requested that we design a similar therapeutic program for his girlfriend who was using oral contraceptives, noting that "she is crazy like I was."

One year later, the patient intermittently was using daily doses of 50 mg of pregnenolone and 25 mg of DHEA. He had experienced no reoccurrence of his previous disorders, was continuing to exercise, and was enjoying life with his girlfriend, who had discontinued use of oral contraceptives and had begun a similar program.

Only limited objective diagnostic criteria and assessment instruments exist for most mental disorders, though physicians often perform blood tests to assess complete blood count and levels of thyroid hormones, blood urea nitrogen, creatinine, and lead. Brain MRIs, electroencephalograms, and electrocardiograms are sometimes used as well. Unfortunately, these assessments are not always helpful in obtaining a diagnosis and preparing a treatment plan. Because the causes of ADHD and social anxiety disorder are not definitively known, achieving effective solutions can be challenging.

The goal of all current ADHD management programs is to correct the most prominent symptoms that interfere with daily activities. Most ADHD medications such as Ritalin® have common, far-reaching, and adverse side effects such as fatigue, emotional instability, depression, high blood pressure, headaches, altered sex drive, impotence, insomnia, frequent infections, poor appetite, and constipation. Moreover, children who take such medications are at risk of poor physical development.¹³ Unfortunately, these psychoactive drugs have been prescribed in unprecedented numbers since the early 1990s.^{14,15} Sadly, many parents believe that these medications are all their children need.

Several psychiatric conditions commonly accompany ADHD in adults and children. In this case report, our patient suffered from a long-time comorbidity of ADHD and social anxiety disorder. We believe that using specific blood tests to reveal critical hormone imbalances may provide a novel method by which physicians can evaluate psychiatric problems such as ADHD,

social anxiety disorder, obsessive-compulsive disorder, bipolar disorder, suicidal ideations, and other behavioral disorders. These problems could be approached as imbalances of hormones, especially neuroactive steroid hormones such as pregnenolone, DHEA, and progesterone. Neurosteroids are very important for normal brain function because they affect several neurophysiological and behavioral processes.¹⁶

It is within the power of physicians, and particularly pediatricians, to change the outlook on a whole group of behavioral disorders and their current treatment protocols. Just as an endocrinologist assesses type I diabetes (insufficient production of insulin) and hypothyroid (the poor function of thyroid gland with low production of hormones) as conditions of hormone imbalance, physicians might also approach behavioral and psychiatric conditions as manifestations of hormone imbalances. Unfortunately, this has yet to occur.

Deficiencies of insulin or thyroid hormones can be life threatening. If an individual suffers from an imbalance of hormones such as DHEA, pregnenolone, and testosterone, however, the patient will not die right away, but instead may experience a gradual decline in health from a collection of chronic illnesses. The patient might suffer throughout life from psychiatric disorders, allergies, infections, and various chronic diseases. In addition, evidence suggests that hormone imbalances may increase the risk of cancer, coronary heart disease, or suicide. Hormone imbalances may also adversely affect cognitive and immune function, while suppressing the reconstructive ability of different cells.

When using blood testing to evaluate hormone levels, we must

remember that *all* hormones are important, as they control and regulate different aspects of life. I believe we can use hormone levels to evaluate mental status, just as blood glucose level serves as a marker for diabetes or thyroid hormones thyroxine (T4) and triiodothyronine (T3) serve as markers for thyroid conditions. An imbalance or deficiency of hormones serves as a warning signal that corrective action is necessary.

The medical approach to correcting hormone imbalances should be similar, regardless of whether the hormone is insulin or pregnenolone, thyroid hormones or DHEA. When a patient has a deficiency of insulin, doctors restore the needed insulin; yet when a patient has diminished levels of DHEA, pregnenolone, or other hormones, doctors often recommend Ritalin®, Zoloft®, Prozac®, or similar drugs. Because the human body does not produce these drugs, it has no deficiency of them.

Several observations led to our hypothesis that correcting hormone imbalances might alleviate behavioral and psychiatric conditions. Children with ADHD often demonstrate a general impairment of sympathetic nervous system activation.¹⁷ Because hormones help



modulate the sympathetic nervous system, we speculated that restoring optimal hormone balance might help improve ADHD.¹⁸ Additionally, studies show significant correlations between clinical symptoms and low levels of pregnenolone and DHEA, further supporting our theory that behavioral disorders could be corrected using neuroactive steroids.¹⁶ In these cases, we always stress the importance of examining total cholesterol. Because cholesterol is a precursor, or building block, for many hormones, cholesterol deficiency may lead to diminished production of basic hormones. Many studies have clearly correlated low total cholesterol with mental illnesses.¹⁹⁻²²

It is time to reevaluate the use of conventional pharmaceutical approaches to different behavioral disorders. Hormone tests may become unique biomarkers in assessing behavioral and psychiatric disorders in children, adolescents, and adults. Doctors, parents, and patients can often find safer solutions to these conditions using natural supplements. By employing these methods as a first step, many are able to avoid prescription drugs. Hormonorestitution is thus a possible treatment option for children and adults with psychiatric conditions that occur alone or in combination.

Omega-3 fatty acids, ginkgo biloba, and valerian root may be additional therapeutic tools for such conditions.

In this article, we described a possible new tool for assessing and treating behavioral and psychiatric disorders. The use of hormonorestitution and nutritional supplements provides a novel way to influence the body's balance of neuroactive steroids, thus offering promise for the millions of Americans affected by conditions such as ADHD and social anxiety disorder. ■

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