

# Teen Anger and Aggression . . . Neurotransmitter Deficiency

by Billie J. Sahley, Ph.D.

What makes some teenagers display angry and aggressive behavior while others are calm and in control? A growing number of scientists are looking at the same area of the brain that is involved in A.D.D. and A.D.H.D., the delicate limbic system. Research demonstrates alterations of function in the limbic system can cause changes in emotional responses as rage, fear, reasoning, and impulse control. The limbic system located deep in the brain's interior is associated with the roots of anxiety, panic, and fear. The limbic system stays in overdrive due to an excessive production of sex hormones. The limbic system connects key parts of the brain such as the amygdala, hippocampus, and the cerebral cortex. The hippocampus is where all memories begin and the amygdala is where all memory is stored. The limbic system marks all negative experiences for playback at a later time such as child abuse, traumatic experiences, or violent behavior. Adolescence is a time of continuous changes in brain chemistry.

Growing up in a dysfunctional home can cause teens to demonstrate anger and aggressive behavior; this accounts for the environmental factor. According to Frank Goodwin, a psychiatry professor at George Washington University, the environment activates a genetic vulnerability. Too much stress, too little support can lead to increased depression. But the majority of evidence points to disturbed brain function and the overproduction of certain chemical and under production of others. Studies done at the University of Illinois Medical School found children and teens with aggressive and disruptive behavior all had low levels of the major inhibitory neurotransmitter serotonin. Serotonin levels are the most accurate predictors of how teens and children will react to punishment. Serotonin transmits electrical impulses in the brain from one neuron to another. Smooth transmission of impulses is interrupted when serotonin levels are low. When this occurs the brain receives mixed signals. According to Ronald Kotulak, author of *Inside the Brain*, scientists now believe that along with the nation's increase in violence, low serotonin may be responsible for a steady increase in depression, especially among children.

During adolescence the teen brain undergoes a multitude of changes, the neural pathways, the connections between neurons affecting emotional skills, physical ability and mental cognition are not yet developed. This development occurs at some point in their early 20s. The teen brain has a tremendous capacity for emotional growth. Girls usually develop much faster than boys. If a child uses drugs emotional growth is delayed, and the ability to sort out, reason and resolve is never fully developed. Drugs are a cosmetic quick fix when parents do not want to take the time to "be there" for their kids and take part in their growing process.

Amino acid blood tests done on one hundred teens and children at the Pain & Stress Center all reflected a major deficiency of neurotransmitters. When the deficiencies were corrected with amino acid supplementation, behavior problems ranging from aggression, anger, A.D.D., A.D.H.D., behavioral disorders, poor concentration, and depression, all diminished remarkably. Inborn metabolic errors, chronic stress, and anxiety as well as an overconsumption of junk food, caffeine, sugar, and alcohol can cause neurotransmitter deficiencies. Chronic stress burnout can also kill vital brain cells.

Scientists have reported a tendency toward anger and aggression can be inherited and found in aggressive genes. This predisposes a teen to anger, violence, and depression, and this gene could be passed on to his or her children. Children are the genetic and environmental products of their parents. The cause of negative behavior can be a direct result of not only genes, but brain chemistry. The delicate balance between the limbic system, amygdala, and prefrontal cortex is the key to where critical judgments are formed. In the case of most teens the limbic system is in overdrive, the amygdala is a storehouse of unresolved anxiety and the prefrontal cortex is sleepwalking. The genes that direct your child's behavior are chemicals that direct a combination of more chemicals. The brain has its own pharmacy, the only drugs you will ever need are already there.

Children who have an alcoholic parent can inherit the alcoholic gene, and demonstrate the same amino acid

deficiencies that cause the craving for alcohol. GABA and glutamine, two major neurotransmitters shut off the craving switch in the brain. When the brain chemistry is in balance, impulsive and aggressive behavior patterns do not dominate brain function.

Serotonin is a major inhibitory neurotransmitter, a chemical that transmits electrical impulses in the brain from one neuron to another. If there is a defect in the serotonin processing in the brain, impulsive or violent behavior results.

Serotonin enables impulses in the brain to harmonize. Serotonin-producing cells send out over five hundred thousand connections to cells in every part of the brain. Serotonin is the only neurotransmitter that is able to do that. The prefrontal cortex is an organizational part of the brain. If there is an injury in that area one of the outcomes is impulsive, uncontrollable, and violent behavior. For teens, the best serotonin source I have used is 5-HTP or 5-hydroxytryptophan. The formula, Teen Link®, is specially formulated for the overactive teen's brain. Teen Link contains a balance of 5-HTP, GABA, Glutamine, Tyrosine, Taurine, and B6.

There is no one solution to teen anger and violence. In addition to amino acids, parents should consider counseling sessions with a behavior therapist/cognitive therapist. Behavior therapists are trained in talk therapy and can help troubled teens sort out their feelings, and feel better about themselves, and most importantly, resolve anxiety. The longer negative feelings stay buried, the more powerful they become. This brain activity not only uses all available neurotransmitters, it sets up a chain reaction that causes them to withdraw and allow their problems to go unresolved.

Parents who put their children on Prozac, Zoloft, Serzone, or any other prescription drug to elevate the serotonin level are only using available neurotransmitters. Drugs do not create new needed neurotransmitters. Drugs only mask symptoms and repress anger that should be resolved. There are neurotransmitter formulas

available that can be given to children and teens safely without the possibility of addiction or long-term side effects.

### Deficiency Symptoms of Low Serotonin In Teens

- Aggression
- Anger
- Depression
- Anxiety
- Panic attacks
- Mood Swings
- Violent tendencies
- Hyperactivity
- Migraine headaches
- PMS Syndrome
- Carbohydrate cravings
- Insomnia
- Obesity
- Fibromyalgia
- Alcoholism
- Obsessive- Compulsive behavior
- Chronic pain

The key is to correct neurotransmitter imbalances in the brain and control aggression by adjusting brain levels of serotonin. Available serotonin declines in situations when chronic stress/anxiety is in control of a person's life. Impulsive and angry behavior become a way of life setting the stage for possible violent

behavior. The teen's brain never slows down, and must be provided with proper nourishment in the form of balanced neurotransmitters on a daily basis. A complete neurotransmitter formula should contain the amino acids, phenylalanine, leucine, valine, histidine, arginine, lysine, isoleucine, alanine, glutamine, methionine, threonine, alpha-ketoglutaric acid (alpha KG) plus B6 and chromium that act as activating agents.

To establish exact amounts of amino acid deficiencies an amino acid blood test can be done. The blood that flows through the brain is a virtual map to its activities.

For more information, read:

*Depression Cured at Last* by Sherry Rogers, M.D.

*Inside the Brain* by Ronald Kotulak

*Is This Your Child's World* by Doris Rapp, M.D.

*Stop ADD Naturally* by Billie J. Sahley, Ph.D.

*Heal with Amino Acids* by Billie J. Sahley, Ph.D. and Katherine Birkner, Ph.D.

*Break Your Prescribed Addiction* by Billie J. Sahley, Ph.D. and Katherine Birkner, Ph.D.

*This article is not intended to give medical advice or replace the services of a physician. It is for educational purposes only.*

© Copyright, 2004 Pain & Stress Publications

This report may not be reproduced by any means without the written consent of the author.

Copyright of MMRC Health Educator Reports is the property of M.M.R.C., Ltd. Co. and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.