

Neurotransmission Disruption in Dependency

By Gayle Madeleine Randall, MD

NEWS **BRIEFS:**



Upcoming Educational Events



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This newsletter will report some of the preliminary observations from studies of over two hundred people with different types of drug dependencies. The purpose is to consider the neurotransmitter imbalances (HPA disruption) that occur in drug dependencies.

Chemical dependencies actually stem from the physiological reactions that take place when a person ingests one or more of these chemical substances. Drugs which are abused resemble natural, neuro-active substances found in our bodies. If they caused no response in our systems, they would not be addictive. This is the cornerstone of tolerance and need for detoxification in drug dependent individuals. During detoxification (detox), the number of receptors in the body is reset. Every psychoactive substance (such as alcohol, benzodiazepines, and opiates) acts on specific sites, or receptors, in the brain and elsewhere. Simply put, the substance is like a "key" while the receptor is the "lock." This key-in-lock action is what

causes the nerves to fire and results in the psychoactive, or "high," response that comes from using addictive substances. If a substance is overused, the number of receptors in the brain and elsewhere in the body is reduced because when there is a large amount of psychoactive substance available, the body perceives that it needs less. The body then reduces production of this similar neuro-active substance and will decrease the number of receptors it has for it. That's why there is a need for increasing amounts of the drug being taken to achieve the desired effect. This process results in increased tolerance to the substance. When more of the drug is taken to overcome the tolerance, nerve damage occurs.

Readers of this newsletter are aware that the picture is more complicated than the "key-in-lock" model and that active neurotransmitters in our bodies are divided into two types—those that inhibit or calm and those that excite or stimulate. The main inhibitory neuro-

transmitters that we can measure are serotonin and GABA, and the main excitatory neurotransmitters are dopamine, norepinephrine, epinephrine, and glutamate. Not surprisingly, these are gravely affected with substance abuse and also with toxicity and prolonged stress, which is always associated with substance dependence.

During intoxication, neurotransmitter levels are strikingly elevated. One of the most surprising results is that almost regardless of the substance used, all neurotransmitter levels are elevated. Like many good discoveries this was originally found by accident in a young woman who came in intoxicated with alcohol and accidentally received two tests. One urine sample was obtained on the day of admission and the second was obtained the next day. During intoxication, levels of all neurotransmitters tested (serotonin, GABA, dopamine, norepinephrine, epinephrine and glutamate) were markedly elevated. The very next day serotonin and GABA were found to be depressed. Then it was observed that similar elevations were also seen during

opiate, benzodiazepine and cocaine intoxication. What differs is the pattern of depletion and the time it takes for neurotransmitter levels to fall after discontinuation of the abused drug. Ongoing research is needed to complete these patterns of depletion and imbalance.

However, it should be kept in mind that during the process of increasing the number of receptors to normal levels during detox, the nervous system is extremely sensitive. Left unmanaged, this process can result in jitters, delirium, and seizures (jerking or shaking movements of body with inability to speak, loss of memory, loss of balance, and sometimes loss of bowel and bladder function). Vomiting with aspiration into the lungs is also possible, which can result in pneumonia or death. Thus, administering neurotransmitter support needs to be carefully selected and guided by testing. In addition, because withdrawal from alcohol, benzodiazepines and barbiturates can result in death, detox must be medically managed by an experienced practitioner.

In addition to the standard routine laboratory tests, such as yearly physicals, two areas of laboratory testing of immeasurable value in managing drug dependencies are the assessments for neurotransmitter levels and nutritional deficiencies. Neurotransmitters are almost always imbalanced with drug dependence. Of course, the readers of this letter have an understanding of neurotransmission; I tell my patients that "neurotransmitters are the chemical messengers that

transmit impulses throughout every system in your body. They are the juices that are responsible for the function of all your organs, your brain, your thoughts, your muscles—everything!" I have observed that when neurotransmitter and nutritional imbalances in patients with dependencies are appropriately addressed with supportive therapies, recovery is greatly enhanced and cravings are reduced or eliminated.

Nutritional deficiencies are common with substance dependence due to neglect as well as the direct toxic effects of the substance abused. These deficiencies can also impact upon the neurotransmission and hormonal imbalances seen in addiction. Prominent examples are B vitamin deficiencies and heavy metal toxicities often seen in those abusing substances cut with these toxins.

Addiction and substance dependence profoundly affects the processes of the brain by altering the level of neurotransmitters and the number of receptors for them. These kinds of changes inevitably result in changes in behavior. Most people diagnosed with depression and anxiety disorders suffer from chemical and neurotransmitter imbalances. Some people call this "neurotransmitter disorder," a term I do not use because it implies a disease, when, in fact, this is an *imbalance* resulting from stress, addiction, or other factors. As most of you may know, neurotransmitter imbalances can also result from numerous other conditions: bulimia,

anorexia, fibromyalgia, chronic fatigue, insomnia, chronic pain, menopause, or any condition that induces serious stress on the system.

Another observation is that almost all patients taking SSRIs have low levels of serotonin when tested. It's worth repeating what Dr. Denise Mark teaches: that the problem with SSRIs and SNRIs is that they only fool the body into *thinking* it has more neurotransmitters than it actually does by selectively blocking the reuptake of neurotransmitters from the synaptic space between nerve endings. This reuptake inhibition means that the neurotransmitter lingers in between communicating nerve cells that use it. Within the literature on this topic there is a description of "Prozac poop out." This phenomenon happens when no matter how much SSRI is taken, no beneficial effects are felt. The reason being that the SSRI antidepressants do not replenish the serotonin pool; they only fool the body into thinking it has more serotonin than it really does by collecting it and holding it in the synaptic space. The observations from these studies in drug dependent individuals have only emphasized this fact.

Most notably, the data strongly suggests that the degree of imbalance depends on the substance(s) abused, the duration of use, and the length of time since last use. One of the most dramatic examples was a forty-two year old man who came in after a ten year "run" of large dose heroin abuse (up to 10 grams per day). When he came in he told me, "Doc I'm done. This is no fun any more. I don't want to do this."

Please help me stop." In this case, measurements of his neurotransmitter levels revealed miserably low readings of virtually all neurochemicals tested (serotonin, GABA, dopamine, norepinephrine, epinephrine and glutamate) during intoxication! This is the opposite of what is usually seen in intoxication. Further observations revealed this depletion pattern could occur in various degrees dependent upon duration and dosage with any abused substance. In other words very high dose and long duration use seems to cause a "burnout" phenomenon with depletion of all neurotransmitters measured.

The most common differences between substances are in the patterns of depletion after detox. As mentioned above, the specifics need to be further elucidated and teased out of the ongoing research. However, as might be expected, alcohol commonly causes depletion of serotonin and GABA and elevates norepinephrine and glutamate partly accounting for the symptoms of excitability after detox. Cocaine and amphetamines, on the other hand, elevate the catecholamine family of neurotransmitters slightly higher than other substances during intoxication and deplete them further after detox. This situation could be predicted based on the chemical classification of

cocaine and amphetamines. THC has a lowering effect on the GABA after detox which is prolonged since THC stays in the system for a month or more, and also seems to elevate glutamate.

The data also suggests that neurotransmitters can be rebalanced in drug dependent individuals after detox with targeted amino acid and vitamin therapies. This balancing can result in improved recovery, manifesting as improved sleep, increased feeling of well-being, improved energy, and decreased anxiety and cravings, to name a few of the observed results.

This process should be monitored by a knowledgeable practitioner because there is a specific order and time over which these chemicals need to be restored that is dependent on the pattern and causes of the imbalances. If neurotransmitter levels are restored without taking the pattern and drugs of choice into account, unpleasant side effects and undesirable mood changes can result. Patients who have had long term high dose dependencies may take longer for complete restoration of levels and nerve healing. A good example is a thirty-four year old man who had been sober for eight years from a long duration opiate addiction. His dopamine was still one third of the lower limit of normal.

When we treated his low level of dopamine and serotonin with targeted amino acid therapy while supporting his GABA, he was pleasantly surprised to experience an even greater sense of well-being. Perhaps there is a neuronal damage that requires support in order to heal, or perhaps balance will only be achieved with support. The bottom line is that balance can be achieved and improve clinical outcome for drug dependent patients.

My recommendation for patients with dependencies is to have their neurotransmitter levels evaluated after detox and receive appropriate therapy from a practitioner who understands this field. This is an incredibly helpful tool for healing from dependencies. It could be that those with preexisting imbalances may seek to medicate themselves by abusing substances. Imbalances also are very likely to result from the stress of abuse and the drug being used. When patients are given selective amino acids and other herbal and vitamin building-block precursors specific to their situation and depletion pattern, they can replenish their neurochemical pools and feel better naturally without impairment of normal brain functioning. This same technology and principle also applies to other neurotransmitters that are depleted, and to the adrenals as well.

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Every "body" has its own innate ability to balance itself with the right nurturing, love, and support. Our immunity, neurochemistry, and metabolism have self-righting mechanisms that are encoded within our genetics. Despite the tremendous deleterious effects on our bodies' systems from chemicals and lifestyle, the body can and will heal. With detoxification, a program of natural vitamin, mineral, and neuro-supportive therapies, and the crucial help of the various therapists, drug dependant individuals can heal and achieve balance of the mind, body, and spirit.

**The views expressed in the Neurotransmission articles are the opinions of the author, and not necessarily those of Sanesco Intl.*

About the Author...

Dr. Randall has been practicing medicine for over 25 years. She has a long standing interest and proficiency in Eastern and Native American healing practices, and was one of the first physicians to introduce and teach Complimentary Alternative Medicine to medical students. She is currently the Integrative and Holistic Medicine Co-director of the Golden Branch Wellness Center in Woodland Hills, CA, and is recognized as a leader in the field of neuropharmacology and chemical dependencies. In addition to maintaining her own clinic, she is also the preferred consulting physician at Passages Malibu, one of the premier detoxification/addiction treatment centers in the country. Dr. Randall's numerous publications, lectures, workshops and seminars on Mind-Body Medicine have helped transform the lives of many patients.

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October 3, 2008

Teleconference

Dr. Gayle Randall will be sharing more of her experience and knowledge on the subject of chemical dependency. Please join us for an informative discussion that will expand upon the research she has done, and give the audience an opportunity to ask questions. The teleconference begins at 9PM EST, 6PM PST.

Dial: 404-920-6689, and enter participant code: 77853414

October 24, 2008

Seminar

San Raphael, CA

Join Sanesco for a discussion with Dr. Denise Mark, who will present an in-depth look at the thyroid and the HPA axis. Dr. Mark will talk about the dynamic role of the thyroid and its relationship with the HPA axis, as well as testing and treatment strategies to maintain optimal function.

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