Nutritional Aspects of Depression: An Update

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By Jurriaan Plesman BA(Psych), Post Grad Dip Clin Nutr

Conventional treatment for depression or mental illness still revolves around either drug therapy psychotherapy or both. The two could well be in conflict. Drug therapy – that appears to treat sy only – indicates that we are dealing with a biochemical imbalance. Drug therapy has generally po among those 40 percent of patients who do not appear to respond to medication.
"In one study of 96 antidepressant trials conducted between 1979 and 1996, no difference could be determined between the effects of antidepressants and sugar pills in some 52 percent of trials." K 2002, KirschI 2002. See also Effects of SSRIs

As an alternative, psychotherapists tend to assume that talk therapy can treat the negative thoug processes in depression, when they believe these to be causes of depression, instead of symptom illness is ***primarily*** a biological disease, talk therapy cannot be expected to cure endogenous dep as it cannot cure schizophrenics from their hallucinations, or diabetics from their insulin resistan disease is expected to result in unique 'psychological experiences' that should not be mistaken fo the disease.

As a reflection of the general dissatisfaction of main stream medicine, including treatment of men one study alone has estimated that in Australia about 57 per cent of medical consumers have floc 'complementary' health practitioners (Bensoussan 1999). It is not clear how many are visiting 'complementary' ***mental health practitioners.*** For other studies see "Alternative Medicine" in th file.

Because of the narrow mainstream psychotherapeutic model, a person suffering from depression himself in a no-win situation, when he gains little benefit from drug- and/or psychotherapy. But i this 'mainstream' narrow therapeutic model to include non-drug Clinical Nutrition, the outlook f treatment is radically more optimistic. The reason is that Clinical Nutrition targets directly the un biochemical disorders without recourse to drugs. When this is combined with the drug/psychoth model the illusive 'cure' of this disease will fall within the grasp of all those with a 'mental' proble

This article will attempt to explain how clinical nutrition can contribute to the treatment of men It is hoped that every therapist – medical, psychiatric or psychological – will be trained in this bra psycho/medicine as part of their formal education and qualifications as we enter the twenty-first

"Depression is a potentially life-threatening mood disorder that affects up to 10% of the populatio approximately 17.6 million Americans each year. In addition to considerable pain and suffering th with individual functioning, depression affects those who care about the ill person, sometimes de family relationships or work dynamics between the patient and others. The economic cost of dep illness is estimated at $30-44 billion a year in the United States alone. The human cost cannot be overestimated." as per Google Search

Symptoms of Depression

Most people may experience feelings of sadness and despondency, but when these feelings becor and protracted we may well be considering pathological depression. This is especially so when no discernible external cause, such as bereavement or disappointment, can be related to the depress kind of depression is often called endogenous depression ("grown from within"), characterized by anguished (dysphoric) mood, anxiety, irritability, fear, worry, brooding, appetite and sleep disturb weight loss, lethargy, difficulty in concentrating and feelings of utter worthlessness. The causes of disorder are multiple and complex and may involve biologic, psychologic, interpersonal and socio factors. Traditional treatment includes the use of antidepressant drugs, rarely now-a-days electroc therapy (ECT), then followed by long-term psychotherapy. Major depression affects up to one six population. Over the course of a lifetime, depression occurs in approximately 20 percent of wome compared with 10 percent of men (Doris). Here we will mainly concentrate on the possible conn between depression and nutrition.

Depression is often a symptom of other disorders, as in schizophrenia or manic-depressive reacti any degenerative disease may have depression as a comorbid condition. Thus if we want to treat d the first step is a visit to the doctor for a thorough medical check-up to exclude any possible medi condition that may contribute to depression. A diagnosis of hyper- hypothyroidism, Ulcerative C Crohn's Disease, Coeliac Disease, Fibromyalgia, Multiple Sclerosis, Lupus, Arthritis, subclinical P Disease, or Alzheimer's Disease, low levels of hydrochloric acid in the stomach (achlorhydria), rat zinc/copper levels, low DHEA, testosterone, pregnenalone, growth hormones and so on, can con the development of depression.

The brain being extremely sensitive is usually the target organ of the body to suffer first in nutritio disorders. Depression may also be accompanied by other problems, such as phobias. Psychotic d characterized by more severe symptoms. Typically, sleep is disturbed, with problems of waking up the morning. It may affect appetite and lead to anorexia (pathological loss of appetite) and decrea drive. Thus the causes are legion. **IF DEPRESSION IS SEVERE SEEK IMMEDIATE MEDICAL HE**

PSYCHOLOGICAL ASPECTS OF DEPRESSION

If a person is always frustrated in achieving his objectives and continually thwarted in his ambitio without saying that he may become depressed through sheer exhaustion. Although exhaustion is physical aspect, failure to reach one's goals may be related to personality problems. Some studies shown that stress interferes with the synthesis of serotonin – our 'feel-good' neuro chemical in th (Research Evidence for Hypoglycemia –> Stress).

Some authors argue that the greater prevalence of women's depression is due to the cultural limit placed on women in society, and that this is more pronounced among those women who have ex gender discrimination within their family. (Bhatia). Constant failure to achieve one's goal will lea frustration and physical exhaustion. A person may not relate well with other people and find it di co-operation. He may have a perfectionist streak in him – never happy with the results of his own even less with those of others.

He may have communication problems either in sending messages to or receiving them from oth she may fail to be assertive in a way without upsetting other people or getting angry. Some unhea environments contribute to depression.

A common feature in this psychopathology is a low self-esteem, which unwittingly puts a person defensive, provoking negative feedback from others.
If the depression is seen as being caused by psychological aspects or personality problem, a cours psychotherapy would be the most appropriate step (See Psychotherapy). However, depression is caused by ill-health or some metabolic disorder.

The Genetic Influence on Depression.

When we speak of genes predisposing us to depression, we usually gain the impression of inevital In the ***Molecular Psychiatry,*** October 23, 2002, Norio Ozaki and colleagues found a mutation is th *Serotonin Transporter Gene (hSERT)* in a samples of families having various mental disorder such phobias and Obsessive Compulsive Disorder (OCD). They write:

"6 of the 7 individuals with the mutation had OCD or OC personality disorder and some also had nervosa (AN), Asperger's syndrome (AS), social phobia, tic disorder, and alcohol or other substan abuse/dependence. Researchers found an unusual cluster of OCD, AN, and AS/autism, disorders with the mutation in approximately one percent of individuals with OCD." A supplement of BCA benefit people with a rare form of autism Network Sept 2012

However a research team led by Caspi A, Moffitt T, found that the expression of the faulty Seroton Transporter Gene would only occur following a long period of stress. Each person carry two copie serotonin transport gene (called by them 5-HTT gene). A short version of the gene carries with it a depression. Those who had inherited two short versions of the gene were the most vulnerable to if exposed to a period of stress. They write:

"In the study, of 847 people, 17 percent (147 individuals) carried two short copies, the least protec option, while more than 31 percent (265 individuals) had the most protective possibility. Betwee extremes, 51 percent (435 individuals) carried one stress-sensitive and one protective copy of the

"Among study subjects with at least one copy of the short, vulnerability-conferring variant of the gene, who had experienced multiple stressful life events, 33% became depressed. Among study su two copies of the short variant with multiple stressful experiences, 43% became depressed. By co among those with two copies of the protective, long variant, only 17% became depressed."

In other words even those people with the least protective copies of the genes (two copies of the per cent in this study **did not develop depression** despite a long period of stress.

Because studies have found an association between insulin resistance and depression, a diabetic also be involved.

Although knowledge of genetic influences on mental illness is important, it may not provide us w *practical* means from a therapeutic point of view. The question remains how are you going to trea genes.

What is important is that experiences of stress may trigger depression in those with a genetic pred to depression. But stressors are of two kinds: biological and psychological. Psychological stressors described in brief above.
But biological stressors are just as important, but these cannot be treated by psychological means to be treated by medico-nutritional means, at the root of one's biochemistry and preferably witho

Hypothyroidism as a factor in depression

The thyroid glands located at the base of the neck control the rate of metabolism and all chemical of the body slow down in hypothyroidism. Hence, it is often associated with overweight and obes

thyroid function may also be an important factor in chronic fatigue and depression. The incidenc
disorder increases after the age of thirty and is 5 to 10 times more frequent in females (Bhatia).
One way of testing hypothyroidism is to take your temperature in the morning before coming out
your temperature is consistently below 36.2C or 97.6F over a number of days, you could be sufferin
hypothyroidism. Besides causing obesity other symptoms are; feeling cold when others feel warm
constipation, hoarseness, lethargy in the morning, depression, loss of hair, brittle nails, dry skin,
palms and puffy eye-lids.
Incidentally, it is claimed that hypothyroidism may also be the cause of high cholesterol, blood ci
problems and heart disease (Barnes et al., 1976). It has also been associated with such disorders as
hypoparathyroidism (underactivity of the parathyroid glands with decrease in serum calcium leve
producing tetany), pernicious anemia (results from the inability of the bone marrow to produce n
blood cells). This may also be due to a deficiency of B12 ('cyanocobalamin') and/or folic acid, vitil
(defective skin pigmentation), rheumatoid arthritis, myasthenia gravis (fatigue of voluntary muscl
especially those of the eye) and chronic hepatitis. Hypoglycemia – or low blood sugar levels – may
from hypothyroidism. We will return to this later.

Treatment of hypothyroidism

The doctor usually confirms the condition by a blood test, but most nutritional doctors believe th
laboratory tests are not accurate enough to detect sub-clinical hypothyroidism and that low body
temperature is a more reliable indicator, other causes of abnormal temperature being excluded.
Hypothyroidism also occurs in **Hashimoto's disease**, a rare disorder that is caused by an auto-imm
destruction of the body's thyroid by antibodies circulating in the blood. If there is a marked thyroi
deficiency the doctor may prescribe thyroxine tablets. The dose needs to be carefully calibrated ar
can help the doctor by taking your temperatures in the morning. Thyroxine is only one of the hor
secreted by the thyroid gland. This drug may be considered a replacement for the natural compou
produced in the body and should not give any side effects. Yet some people with angina problems
cautioned when taking thyroid medication and should be carefully monitored.
Sometimes hypothyroidism is caused by a deficiency of the thyroid stimulating hormone (TSH) p
the pituitary gland. Thus an accurate diagnosis by a qualified doctor is needed when dealing with
hypothyroidism. Iodide in food is transported to, trapped in and concentrated by the thyroid cell
combines with tyrosine (an amino acid derived from phenylalanine – protein source) to form thy
and triiodothyronine (T3) which is stored by the gland. High levels of T3 and T4 will suppress the
of thyroid stimulating hormone (TSH) from the pituitary gland. Thus a balance is maintained (Ba

Nutritional aids in thyroid therapy

There is some doubt whether nutrition alone will help to overcome the problem of hypothyroidis
Nutritionally, thyroxine production depends on a complex range of nutrients. Iodine is one of the
of thyroxine. This is contained in kelp and iodized salt. It is said that vitamin A – retinol – and not
carotene form is essential in converting iodine into thyroxine. The liver can't convert carotene to
in the absence of thyroxine or in hypothyroidism. (Kirschmann, 14) Vitamins B2, 3 & 6 and C are
absorption of iodine. A B1 (thiamine) deficiency alone can cause hypothyroidism. Vitamin B12 ca
absorbed with a deficient thyroid gland. Copper is required for the production of TSH from the pi
Foods that interfere with the uptake of iodine are: cabbage, kale, Brussels sprout, cauliflower, broc
Kohlrabi, turnips, rutabaga, rapeseed, brown (Indian), black, or white mustard, garden cress and
soybeans, skins of peanuts, almonds, and cashews. Thus when eating these food frequently one s
extra iodine supplementation. The first choice should be kelp if it is tolerated. The following chem
substances inhibit iodine uptake; sulfa, anti diabetic drugs, prednisone, estrogen, smoking (thyoc
inhibitor) and fluoride (thyro suppression).

Hypothyroidism and tyrosine deficiency

It is interesting that tyrosine – a non-essential amino acid – is a precursor to thyroid, adrenocortic hormones and to dopamine. It is also a precursor of melanin – pigment found in hair, skin and th of the eye (Wintrobe ,615). Vitiligo is the disorder of melanin distribution on the skin and could th related to hypothyroidism. Deficiency of tyrosine may show up as having low body temperature, l pressure and 'restless legs'. The body can produce tyrosine from an essential amino acid called phenylalanine; that is, humans derive the latter from the diet – mainly a high protein diet. (Rich S Deficiency of the latter lead to a variety of symptoms including bloodshot eyes, cataracts and beh changes. Phenylalanine is also the precursor (via tyrosine) of dopamine, then on to norepinephri epinephrine (adrenaline) – a deficiency of these may lead to depression – indicating that it affects in a fundamental way. Low levels of hydrochloric acid in the stomach (hypochlorhydria) may blo digestive process of amino acids including phenylalanine. Sodium of bicarbonate is needed to alk duodenum for digestion of foods leaving the stomach. (Sodium bicarbonate should only be taken doctor's supervision as it is counter indicated in some serious illnesses; GI ulcers, congestive hear low blood volume (hypovolemia) and electrolyte imbalance).

Thyroid deficiency may be treated naturally with supplementation of phenylalanine or tyrosine. A could also be the treatment for depression, we are killing two birds with one stone. However, supplementation should be under the supervision of a doctor as excessive dosage may produce to Animal studies have shown that when phenylalanine is taken in large doses – in excess of 3 perce an amino acid imbalance may cause tyrosine toxicity (Agric. Biology etc. 1982), however this is m in the human diet. Phenylalanine can aggravate a preexisting pigmented melanoma (a type of ski (Pearson et al.1982,136). Some studies have suggested that schizophrenia may be due to an error i dopamine metabolism. As phenylalanine is a forerunner of tyrosine and then of dopamine, admi of L-Dopa (which passes the brain barrier, not dopamine) together with antioxidants may help s schizophrenics according to Pearson. (Pearson et al.1982, 135 for more details)
Neither phenylalanine nor tyrosine should be supplemented in individuals taking monoamine ox inhibitors (MAO inhibitors), Chaitow, 1985, 58).
Dosage: For depressive states 100mg to 500mg of L-phenylalanine per day. Results should show in Caution: hypertensive individuals should start from around 100mg daily and blood pressure shoul checked. People suffering from phenylketonuria – a disease caused by a defective enzyme – *pheny hydroxylase* – converting phenylalanine to tyrosine are accumulating phenylalanine at toxic leve should avoid it at all cost. It is **essential** to consult a doctor when considering taking phenylalanin individual nutrients
.
I always prefer that nutritional supplements be provided from a natural diet. Supplements may n nutritional deficiencies as explained in the article: "Hit or Miss Supplements for Depression." Go

MAO inhibitors

Monoamine oxidase (MAO) is an enzyme in the brain which degrades the monoamine neurotran dopamine, norepinephrine (NE) and serotonin. This enzyme functions to maintain proper levels beneficial neurotransmitters contributing to our mental health. This enzyme increases in activity lowering the levels of the neurotransmitters available to the brain. Hence older people are incline more depressed. When doctors prescribe MAO inhibitors – e.g., iproniazid, isocarboxazid, phene tranylcypromine – they attempt to inhibit this enzyme thereby increasing the concentration of th neurotransmitters.

However, these drugs need to be administered with caution. They can cause hypertensive crises (pressure), interact with other depressant, or hypotensive drugs and they react with many foods a beverages such as cheese, protein extracts, soy sauce, pickled herrings, and red wine. People with cardiovascular disease and those with hepatic (liver) and renal (kidney) insufficiency are especiall with MAO inhibitors. Some side effects are insomnia, agitation, dizziness, low blood pressure wh

lying position (sleep), constipation, dry mouth, blurred vision, difficulty in urination to mention
Pearson and Shaw (1982, 184) reported that procaine – or the procaine compound Gerovital (GH3
developed by Dr Anna Aslan of Romania – is a mild reversible MAO inhibitor. Procaine – GH3 or K
(Shering P/L) in Australia – does not seem to require the precautions of synthetic MAO inhibitors
phenylalanine and KH3 may be a very effective natural anti-depressant. They reported that; "Phe
was twice as effective as the current prescription 'drug of choice' for depression, imipramine, in c
tests" (MacFarlane, 1975).

Natural sources of phenylalanine: soybeans, cottage cheese, fish (especially trout), meat, liver, la
almonds, Brazil nuts, pecans, pumpkins, sesame seeds, lima beans, chickpeas and lentils. (Chait
61). Note: soybeans and almonds are said to interfere with iodine uptake above.

Hypoglycemia

Much has been written and spoken of the much maligned and misunderstood hypoglycemic con
Over 62% of people diagnosed as being hypoglycemic have been reported to suffer from depressio
insomnia. (For association of hypoglycemia and depression go to Research file and look up <depr

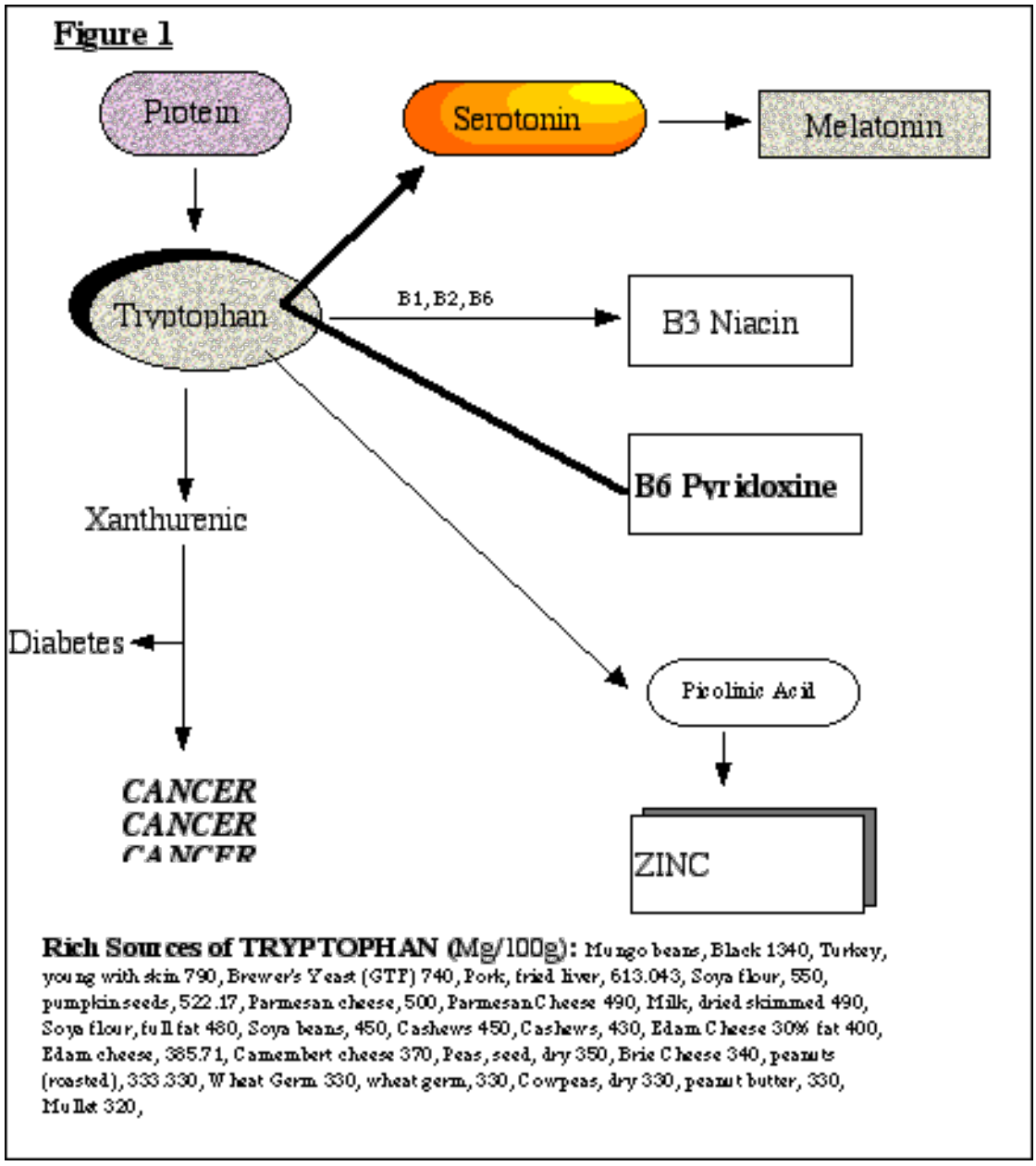
Thus hypoglycemia must be regarded as an important cause. The explanation is simple. When th
sugar level drops below a certain level, the brain is starved of its source of energy – namely glucose
get depressed. When the brain is suddenly starved of glucose, the pituitary gland sends an urgent
the adrenal glands to pour adrenaline into the blood stream. Adrenaline is a hormone that rapidly
glycogen – or stored liver sugar – into glucose, thus raising the blood sugar level. However, adrenal
the fight/flight hormone, readying the body for quick action in case of danger. Thus the sudden p
adrenaline in the blood stream wakes up the poor sleeper – usually in the early morning. Psychiat
other orthodox psycho-oriented practitioner often interpret this by claiming that 'the patient is t
worrying type'. Thus depression and insomnia are often found together. Medical practitioners ca
the diagnosis of hypoglycemia by taking a four hour Glucose Tolerance Test.

One such a test has been designed by Dr George Samra. See: GTT. The nutritional doctor is not so
interested in the low level of blood glucose, but rather in the rate of descent of blood sugar in resp
insulin production by the pancreas. If the fall in blood glucose is over 2.6 mm/l in any one hour o
in any half hour, the brain is starved of glucose with all the pseudo-psychological consequences,
depression (Samra, 2004, 67).
Depression, as seen as a symptom of hypoglycemia, naturally suggests that a strict hypoglycemic
main remedy against depression. Indeed this is the first step in the treatment of depression.

The hypoglycemic diet consists of three hourly, high protein snacks, the avoidance of sugar, coffe
drinks, white rice, white bread and cakes, and should be supplemented with high potency B-com
vitamins and Vitamin C. The vitamins should also contain chromium and zinc. Sometimes some
symptoms of hypoglycemia can be overcome by the taking of one table spoon of glycerine mixed
fruit juice or even water with a dash of lemon juice. Glycerine is not recognized by the pancreas as
does not stimulate the over-production of insulin. Fructose has a similar biochemical pathway as
but excess fructose may result in high triglyceride levels. If so, increase niacin and fish oil supplem
However, it is of little use to people who are allergic to either glycerine or fructose. Many people c
peaceful night with glycerine. Others find that simply taking vitamin B1 (thiamine) involved in gl
metabolism gives them a peaceful night's sleep. Some find help in vitamin B-5 (pantothenic acid
magnesium.
Nicotine, caffeine and alcohol cause the liver to produce drug antagonists – ie., stimulants – usual
form of adrenaline. This destabilizes the blood glucose levels and consequently affects the energy
the brain. Hence people suffering from depression are discouraged from taking these drugs, quite
a host of other ill effects. References for Mood Disorders and Nutrition

Tryptophan and vitamin B6 (Pyridoxine)

Depression can also be caused by the body's inability to produce a neurotransmitter called seroto
is normally synthesized in the body from other substances. Serotonin is a natural tranquilizer pro
within the body from food. Tryptophan – an essential amino acid and building block of protein –
forerunner of serotonin. See **Figure 1.** Thus a low protein diet, typical of hypoglycemics, causes a
deficiency. Studies have shown beneficial effects in the treatment of depression by administering
tryptophan, 4-6 gms daily. Protein should be avoided for 90 minutes before and after administratio
uptake can be improved with – of all things – sugar. An alternative is 5-HTP, an intermediate in se
production, that can be taken any time. But see "Hit or Miss article". Insulin improves absorption
lowering levels of competing amino-acids.



Without sufficient tryptophan we cannot produce serotonin. Tryptophan is converted to seroton
natural calming agent – in the presence of vitamin B6 (Pyridoxine). When there is a deficiency of v
tryptophan may be transformed into excessive xanthurenic acid which may cause cancer (bladde
the pancreas and cause diabetes. A B6 deficiency can cause sleepless nights. Now it happens to b
that B6 (pyridoxine) is also involved in ridding the body of toxins. There is speculation that peopl
vitamin B6 deficiency – as among drug addicts – cannot remember their dreams. Hence any drug t
the presence of toxins will use up all our vitamin B6, so that we have none left to convert tryptoph
serotonin.

People on anti-psychotic drugs also need higher doses of vitamin B6. Detoxification is also aided b
C. But when taking medications please discuss these supplements with your doctor as suppleme
counteract the desired effects of drugs.

To complicate matters a little further, tryptophan is also the forerunner of vitamin B3 (niacin), wh
important that the body considers its production to be more important than that of serotonin. It
mg of tryptophan to produce 1 mg of niacin in case of dietary niacin deficiency. (Kirschmann, 36
42). If you want to avoid the harmless side effects of flushing when taking niacin, take aspirin. Rad
a safer alternative vitamin B3 is inositol hexaniacinate, also called ***hexanicotinate*** or inositol nico
which does not give a flush. Head KA (2000)
It could explain why niacinamide supplementation (another form of niacin) to schizophrenics m
sometime be helpful to liberate the production of serotonin from tryptophan. Vitamin B3 deficie
cause insomnia, mood swings, bedwetting in children, crying spells, anxiety, depression and affe
sight.

Furthermore, tryptophan is needed in the absorption of zinc. Zinc absorption across the intestin
membrane requires its combination with picolinic acid produced in the pancreas from tryptopha
et al, p 482. In **Figure1** this is shown by the arrow pointing to picolinic acid resulting in zinc abso

Consequently, supplementation with niacin, zinc and/or vitamin B6 could theoretically, at least,
the available tryptophan for conversion to serotonin, which can then be converted to melatonin,
sleeping hormone.
Although this information is somewhat complex, the practical aspects are that we can help ourse
have a more restful sleep by 1) having three hourly high-protein snacks during the day, 2) have a s
bedtime, 3) making sure that the body has sufficient vitamin C and B-complex vitamins, especiall
B1 and B6, 4) taking a table-spoon of glycerine before bedtime if insomnia persists, 5) taking comm
available tryptophan tablets and 6) taking vitamin B3 (Niacinamide or hexanicotinate) which ma
the available tryptophan in the body for the production of serotonin and melatonin. A natural wa
helping you to fall asleep is explained in: Sleeping Tablets and its Alternative.

However, tryptophan supplementation may have adverse reactions and should be administered u
supervision of a doctor. In 1990 it was reported that the pill L-tryptophan was associated with a ra
disease, eosinophilia myalgia syndrome (EMS). However, in the New England Journal of Medicin
357-365 (1990) it was found that the manufacturing process of one manufacturer resulted in the in
an unidentified chemical substance that was associated with the EMS. It is a pity that authorities
this supplement away from the market.

Natural sources of tryptophan: Soya protein, brown rice, cottage cheese, fish, beef, liver, lamb, p
pumpkin, sesame seeds and lentils. See Sources file. See also Tryptophan at Index.
Milk and cheese contain tryptophan and this is why a glass of warm milk before bedtime sends m
to sleep. That is, if you are not allergic to milk products! Warm milk combined with a tablespoon o
is an ideal sleeping agent.Bananas and dates also provide tryptophan. Other good sources of tryp
chlorella or other green or blue algae tablets taken at bedtime to induce sleep (via serotonin
production).Some people respond positively when they take vitamin B1 (thiamine) before bedtim
However, if you take vitamins you should be warned that the taking of vitamins after six o'clock –
vitamin C – may keep you awake. These vitamins are involved in the production of many body me
of which adrenaline is one. A good indication of vitamin B6 deficiency is the inability to recall dre
waking in the morning. By taking vitamin B6 you should recall your dreams. If you take too much,
suffer nightmares. But we should remember that taking nutritional supplements, considered as 'd
the same pitfalls and short comings as other 'silver bullets' therapy. They may miss the target!! Se
Hit Supplements

The Melatonin connection

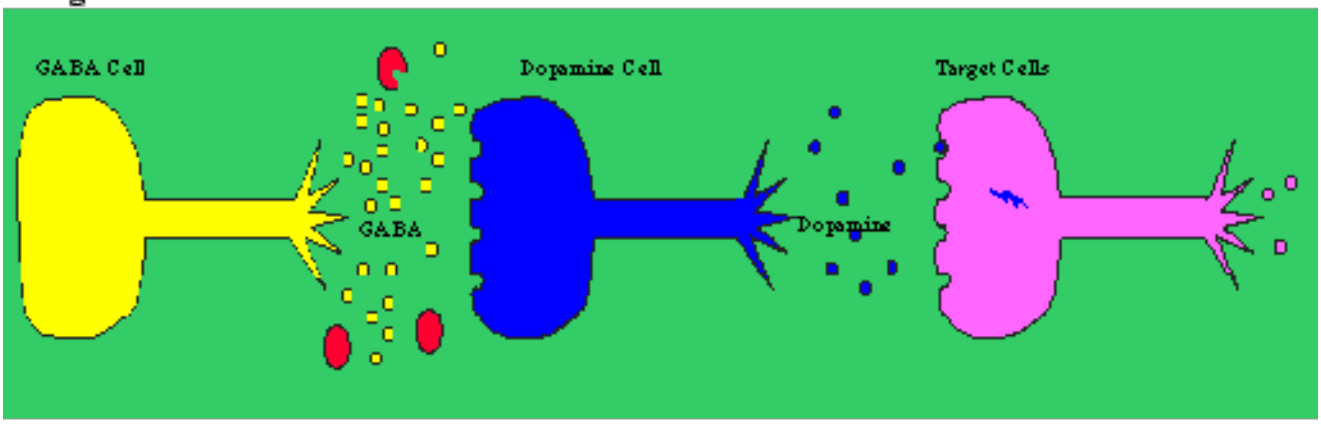
Looking at **Figure 1** it is shown that serotonin is also the precursor of melatonin, a hormone prod
pineal gland. (Wintrobe , 574). When the eyes perceive dusk – or darkness – it signals the pineal gl
produce this hormone which is closely related to our diurnal cycles of sleep and wakefulness. It h
qualities and help reduce anxiety, panic disorders and migraines as well as induce sleep. Melaton
powerful antioxidant and is known to eliminate free radicals toxic to DNA. Thus sleeping restores
immune system. Melatonin inhibits release of oestrogen thereby reduces risk of breast cancer. (JA
Dec 1998, 31). It seems that a disturbance in the diurnal melatonin production causes depression
than the amount of melatonin in the body at a certain time. Studies have shown that exposure to
early morning sunlight (between 7.00AM and 9.00 AM) for at least fifteen minutes is perhaps the m
powerful signal that "sets" the biological clock, thereby washing away depression. (The Burton Gr
Also Google search <Light Therapy>

There is some evidence that when people are exposed to artificial light – that is, light lacking the f
spectrum sun light – the body cannot absorb certain nutrients and this contributes to fatigue, too
depression, hostility, suppressed immune function, hair loss, alcoholism and drug addiction and
cancer. (Ott, Roos). Studies have shown that students in classrooms with full-spectrum lights had
absenteeism, higher academic achievements, diminished hyperactivity, compared with classes u
ordinary fluorescent lighting.(The Burton Group, 322). It is claimed that taurine levels rises in the
pituitary gland through exposure to full spectrum daylight. Lack of taurine may lead to mental im
and depression.(Chaitow, 38)

The GABA connection

Minor tranquilisers known as benzodiazepines occupy special receptors in the synapses (junctio
brain cells) of nerve cells. This can affect the function of a natural neurotransmitter called GABA o
amino-butyric acid. This is essentially a inhibiting neurotransmitter. Neurotransmitters are horm
chemicals controlling messages between neurons in the brain. The function of GABA is explained
2.

Figure 2



1)GABA cells release the neurotransmitter GABA, which inhibits release of dopamine from the Dopamine Cells. This sends a message to Target Cells that it has had enough. 2) COCAINE blocks the re-absorption of dopamine by the Dopamine Cells, thereby increasing availability of dopamine, causing an intense feeling of pleasure and a craving to repeat that pleasure. 3) This causes addiction to COCAINE. Source: www.pet.bnl.gov/neuron.html

GABA is produced by specialized cells. It fits neatly into receptor molecules of other cells and ther
to inhibit and control the release of dopamine from dopamine cells. Dopamine causes intense fe
pleasure. Thus GABA regulate the release of dopamine which influences other cells to experience
(or satiety). It is said that severely depressed people cannot experience pleasure and hence it is im
get some understanding from the relation between GABA and dopamine. Excess dopamine produ
intense pleasurable rewards – produces addiction to substances that causes excess dopamine secr
cocaine addiction, the reabsorption of dopamine is blocked by dopamine cells, resulting in exces
dopamine. This leads to intense pleasure and results in cravings for the same substance.

Nicotine, as an addictive substance, acts by occupying the GABA receptor sites on dopamine cells out GABA, thus causing increased dopamine production and addiction.
It is plausible that ongoing dopamine synthesis causes dopaminergic exhaustion.
Scientists from the Department of Chemistry, Brookhaven National Laboratory, Upton, NY 11973 carried out experiments with gamma-vinyl GABA – an inhibitor of GABA transaminase – to reduce production of dopamine even after administration of heroin or cocaine (Gerasimov). A new drug (*acamprosate*) appears to have a similar action, that stops craving for alcohol in alcoholism. This open a new way for the treatment of drug addiction
I am not aware of any studies that have used tyrosine or phenylalanine supplementation in drug programmes. As was shown before, the amino acids phenylalanine and/or tyrosine are precursors dopamine
The conversion from dopa to dopamine is dependent on vitamin B6, again showing that a B6 def cause depression. Studies are needed to show whether supplementation of phenylalanine, tyrosi will benefit people withdrawing from addictive drugs, including nicotine.
It is interesting that inositol and vitamin B3 (niacinamide) are said to occupy the same receptors may explain why some people feel relaxed and sleepy when taking these nutrients (Pearson et al.
The body produces GABA from glutamic acid in the presence of vitamin B6 (pyridoxine). Glutami cannot pass the lipid layer of the brain cell unless in the form of glutamine. When glutamine ente cell it is converted to glutamic acid. In this form it can either 1) combine with ammonia – a highly product of protein – to form glutamine, to be carried to the liver and then excreted as urea in the u combine with vitamin B6 to form GABA. Glutamic acid itself is an excitatory substance. Thus if th deficiency of vitamin B6 there may be an excess of glutamic acid causing anxiety and restlessness: an excess of vitamin B6, too much GABA is produced causing one to feel tired and depressed (Vay Glutamine supplementation has been known to stop alcohol sugar craving (Rogers, 1957). Howev point, some controversy about the use of glutamine has recently been reported, and it is best to o supplement with glutamine only under doctor's supervision.
(For further details, please Google search <glutamine site:www.mercola.com> for articles on this controversy.

It is important to realise that minor tranquilisers dispensed by doctors will ultimately aggravate th symptoms for which they were prescribed. Although drug therapy may have short term benefits i instances, it is better to experiment with natural nutrients to achieve the same ends without the s

Toxic Metals

Related to hypoglycemia is heavy metal intoxication. High levels of lead, mercury and cadmium i with the enzymes breaking down glucose into energy within the mitochondrion of cells that carry aerobic respiration and where the Krebs cycle is located. Heavy metals are said to replace zinc, a c required in about 300 enzymes (Source). The result is symptoms that are practically indistinguish those of hypoglycemia – fatigue, insomnia and depression, even in the presence of normal blood levels. Dr Samra calls this "Cerebral Hypoglycia".

Zinc deficiency also interferes with the conversion of vitamin B6 (pyridoxine) into its active form, pyridoxine-5-phosphate. (See Notes)

Often this can be prevented in our polluted environment by increasing zinc intake to prevent hea from occupying substrate molecules in enzymes. Sunflower seeds, oysters and crustaceans are sai high zinc content. Foodstuffs containing mercaptan groups or sulphur containing compounds – onions, garlic and eggs – have the ability to claw out heavy metals from the body over a period of t name mercaptan comes from their ability to react with ('seize') mercury. The amino acid methio vitamin B6 is perhaps the most effective and natural way of detoxifying the body of heavy metals (1985, 55).

Anti-oxidant supplementation with vitamins A, E, C and selenium is also helpful. Toxic metals in
are known to increase free radicals, which have been associated with cancer and against which ar
provide protection.
Also zinc and copper intake should be in balance. A high copper levels in relation to zinc (about 3
affect those enzyme requiring zinc. High zinc absorption can decrease copper absorption and vic
both are essential minerals in nutrition and for general health. Werbach,, 1991, 315.

Allergies

Foods may cause mental and behavioural symptoms by a variety of mechanisms including cerebr
food addiction, caffeinism, hypersensitivity to chemical food additives and reactions to amines in
the subject of allergies remains controversial among the medical profession. The body's unique o
to a substance – foreign or not, internal or environmental, organic or chemical – causes stress whi
time will lead to exhaustion and overt illness, including depression. If allergy is a factor in the trea
depression, then avoidance of the source of allergy is the most important treatment technique. T
several treatment approaches: avoidance, reduction of total load, rotary diet, desensitization, neu
nutritional supplements etc. If you want to find your allergies as a home exercise by means of a da
diary please read "Finding your Allergies". Also Dr George Samra, The Allergy Connection, 2004.

Prostaglandins in allergies and disease

Much has been written about the role of prostaglandins in the mechanism of the immune system
allergies. Prostaglandins – very active organic compounds derived from essential fatty acids – caus
physiological effects in animal tissues. They act at very low concentrations to cause the contracti
smooth muscles. Prostaglandins may have antagonistic effects on blood circulation: thromboxan
blood clotting while prostacyclin causes blood vessels to dilate. Both thromboxane A2 and prosta
derive from series 2 prostaglandins (2PGE) from arachidonic acid, usually rich in animal food sour
series 2 prostaglandins have been associated with many 'degenerative' diseases such as arthritis a
allergies.
The more beneficial prostaglandins – the series 1 prostaglandins or PGE1 – are known to prevent
adhesiveness, inhibit inflammatory reactions, dilate blood vessels thereby improving blood circul
control blood pressure, help in weight reduction, improve the effects of insulin, activate T lymph
inhibit abnormal cell proliferation (Davies & Stewart, 1987, 113). Allergic people have low PGE1 ar
reason is that they may be deficient in cis-linoleic acid in the diet from which it is manufactured.
Safflower oil contains 70 percent of linoleic acid and is therefore a rich source along with poppy s
sunflower, soybean corn etc.
An enzyme, delta-6-desaturase converts cis linoleic acid (cLA) to gamma linolenic acid (GLA) requ
following vitamins and minerals; pyridoxine (B6), zinc, magnesium, B-complex vitamins and vita
E (as an anti-oxidant). It is thought that some people have a deficient D6D enzyme and if this is s
advised to take Evening Primrose oil as this contain about 10 percent of GLA. Other plant sources
borage (Borago officinalis) and blackcurrant (Ribes nigra). These are all forerunners of the series 1
prostaglandins. It is hoped that supplementation with the omega-6 essential fatty acids will bring
order into the erratic behaviour of the immune system.

The Omega-3 Phenomenon

However, other authors (Rudin & Felix, 1987), have warned against bringing about an imbalance b
omega 6 and omega 3 essential fatty acids, all precursors of prostaglandins, especially in relation t
'psychological and psychiatric disorders'.
They argue that because of the heart attack scare and the need to avoid fat, manufacturers have pr
alternatives in the form of vegetable oils as in margarine production. It is doubtful whether this ha
dent in the rate of cardiovascular diseases. The consumption of essential fatty acids has shifted th
towards warm climate oils (omega-6) such as safflower, sunflower, corn, almond oils and so on, ar

from the cold climate oils (omega-3) such as linseed, salmon, walnut, wheat germ and soybean. T
difference is that cold climate oils are even more unsaturated and that the body need these to pro
beneficial prostaglandins. Fish oils contain two additional types of omega-3 fatty acids, made fro
acid: DHA or docosahexaenoic acid, and EPA or eicosapentaenoic acid. They keep the blood thin
platelet stickiness and are especially recommended to prevent cardiovascular diseases. Fish prod
from plankton in the sea.
Flaxseed (Linseed) oil contains 60 percent omega-3 and 20 percent omega-6 essential fatty acid ar
recommends the use of Flaxseed oil as the source of alpha linolenic acid, from which the body ca
its various prostaglandins. Alternatives are fish oils and MaxEPA capsules. Omega-3 fatty acids fou
oil play an important role in depression.

Candidiasis and parasites as a source of depression

Internal parasites and fungi, especially for those people with hypochlorhydria – producing low le
hydrochloric acid, a natural defence barrier to internal parasites – interfere with the absorption of
gut. This may produce irritable bowel symptoms, diarrhea, fatigue, ***depression***, urticaria (rashes),
(pain in joints), uveitis (inflammation of the pigmented part of the eye) and generally malabsorpt
carbohydrates, fats, proteins, vitamins and minerals. Most doctors are now aware of the pervasive
health of candidiasis or thrush – the mould disease. This often follows a long period of medicatio
antibiotics, which tend to kill off 'friendly flora' inside the intestines. Patients following a regimen
antibiotics should consume generous amounts of Lactobacillus Acidophilus present in yogurt or b
including perhaps tablets of L. acidophilus to reestablish the friendly intestinal flora. Friendly int
bacteria produce most of the required vitamins and will make up for any deficiency in the diet. Als
apples and bananas tend to absorb unfavorable bacteria while promoting the growth of beneficia
organisms.

Individual nutrient deficiencies and depression

The following individual nutrient deficiencies have been reported to be associated with patients s
from depression.

Vitamins

- biotin
- folic acid
- pyridoxine
- riboflavin
- thiamine
- vitamin B12
- vitamin C

Minerals

- calcium
- iron
- magnesium
- potassium

Conversely, abnormal levels of magnesium (hypo- and hyper-levels) and vanadium have also bee
associated with depression. (Werbach, Chapter on Depression))

Herbal remedies

Most people would be aware by now of the antidepressant effects of **St John's Wort** (*Hypericum*

perforatum), which has similar action as the SSRI drugs. It inhibits the reuptake of serotonin in t
the treatment of mild to moderate depression. (Werbach, 1994, 135) In Germany doctors prescrib
remedies routinely and St John's Wort (standardized to contain 0.3% hypericin, taken 3 times a da
more popular than the conventional drugs such as Prozac and Zoloft. Hypericum has also been fo
useful in conditions associated with anxiety, stress, premenstrual syndrome, fibromyalgia or chro
But they do interact with a number of drugs: it decreases bioavailability of digoxin, theophylline (a
cyclosporin (immunosuppressant), and phenprocoumon (anticoagulant), potentiate with MAO
and SSRI <Erocap, Luvox > at Research file.
Also fair-skinned people are advised to avoid prolonged exposure to sunlight, because of heighten
sensitivity to the sun. It takes some time – about four weeks – before the herb becomes effective
Where cerebrovascular insufficiency is a contributing factor of depression, the use of **Ginkgo bilob**
(Standardized to contain 24% gingkoflavoneglycosides) in animal studies have been shown to be
reduce anxiety and depression. (Werbach, 1994,135).
If toxaemia (toxic overload) is seen as contributing to depression, perhaps Milk Thistle (*Sylibum m*
will help the liver to accelerate detoxification. Using herbs like drugs for depression may miss the
responsible for depression. Hit or Miss.

For a general reference to an index for Nutritional and Herbal remedies for mood disorders go to R
Index.

Conclusion

It is clear from the above that the treatment for depression by clinical nutrition is very unlike the p
whereby a doctor – usually a psychiatrist – prescribes a drug for a 'psychiatric' symptom. Tricyclic
depressants are potent anti-histamines and this property may help to explain their effectiveness
psychiatric symptoms associated with allergic reactions. But it is obvious that the patient is not 'c
fact he may be made to feel worse through the actions of side-effects, for which other drugs are us
prescribed. The effects of side effects can often be overcome by special nutritional supplements; 1
case of Tardive Dyskinesia (the trembling disease of anti-psychotic drugs) Vitamin B3, B6, C, E an
manganese, 2) Lithium medication – for manic-depression – should be accompanied with safflow
GLA. Also lithium carbonate may cause a **folic acid** deficiency. (Werbach MR, 81)
Evening Primrose oil is an excellent source of GLA.

See also "Nutritional Aspects of Schizophrenia" in our Hypo Newsletter June 2001 at page 7 in PD

A more patient-friendly group of new drugs are the SSRI (Specific Serotonin Reuptake Inhibitors)
bring about a more natural remedy. They block the reuptake of serotonin. However, a long-lasting
the availability of serotonin neurotransmitter at a synaptic receptor site results in a decrease in th
of receptors on the cell surface (so-called down regulation). *(Aust Prescr 1999; 22; 106-8)* Thus, a be
understanding of the relation between nutrition and depression would usher in a more natural tre
depression.
Clinical nutrition can be effective once it is understood that each person is a biochemical individu
persons are the same! Similar disease syndromes may and usually derive from a set of divergent fac
understand the disease we need to study the individual patient. Depression is not treated, but a de
person is! We can't treat alcoholism, but we can treat a person suffering from alcoholism, includin
psychological make-up.
The treatment of depression by clinical nutrition – as is the case with all medical/health problem
personal history taking by the practitioner, a thorough biochemical investigation of the individua
leading to the diagnosis and treatment program. Often if the program does not work, a further inv
needs to be carried out and a new diagnosis generated. This all depend on the scientific mind of th
practitioner, his knowledge of medicine, biochemistry and nutrition and above all his creative 'de
like' imagination leading to new hypotheses explaining the symptoms. Often the more successfu

practitioner is a member of a health team who pool their resources in this complex world of 'alter
medicine'.
In the end the individual patient and society – in particular the tax paying society – are going to b
this form of preventative medicine.

A popular motto in Clinical Nutrition is that **'the body runs the brain'**.

Please discuss this article with your health care worker, doctor or nutritional doctor or therapist.

Related Articles:

What is Hypoglycemia?

The Serotonin Connection

The Hypoglycemic Diet

Beating Anxiety

Anxiety, Gambling and Phobias

Self-help

PSYCHOTHERAPY

Also read:

Index to Specific Topics and Research

References to Mood Disorders and Nutrition

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