

Adrenal Exhaustion - Its not old age **By Alice Sykes MSc**

One way to define health is by the balance between life's stresses and the resources we have to cope with them. Tip the scales in the wrong direction for too long, and we burn out.

Nature equips every newborn with a pair of adrenal glands, packed full of vitamin C, potassium, zinc, pantothenic acid (B5) and essential fatty acids. Each adrenal gland is nestled on the upper inner surface of each kidney and consists of a larger, outer portion, called the cortex, and an inner portion, referred to as the medulla. Although the cortex and medulla are integrated by structure, these two regions are completely separate in function.

The medulla produces adrenaline and noradrenaline, which prepare the body for physical effort and respond to stress. The cortex produces cortisol and aldosterone, which are vital in maintaining balance and homeostasis of the body chemistry under stress. The cortex also produces sex hormones, such as those produced in the testes and ovaries.

The adrenal cortex is capable of synthesizing over 60 steroidal hormones, including gonadocorticoids (progestogens, estrogens, and androgens), mineralcorticoids (mainly aldosterone) and glucocorticoids (cortisol).

Cortisol is a major player in the body's response to stress and directly influences the metabolism of sugars, proteins and fats. The glucocorticoids are so named because of their actions in raising blood sugar. During a stressful event, cortisol helps sustain blood sugar concentration by temporarily preventing the absorption of glucose by all tissues except the brain and spinal cord. In addition, cortisol forces the breakdown of muscle and other organs into amino acids, which it then helps convert into glucose for extra fuel.

Physical effort can cause cortisol to rise, with a simultaneous decrease in the hormone DHEA. This is undesirable, interfering with growth and recovery by increasing the rate of protein breakdown. Cortisol levels often remain chronically elevated in athletes who over-train, the chronically ill, anxiety-prone personalities, and sedentary individuals who adapt to stress by over-eating.

High cortisol levels are immunosuppressive and destroy sexual function and libido. Elevated cortisol has also been implicated as a factor in substance abuse, smoking, alcoholism, anorexia nervosa, impairment of memory and age-related neuronal damage. It has also been associated with altered cardiac rhythm patterns.

Stress of any kind, including injury, extreme heat or cold, pain, viral infection, chronic disease, intense exercise, or negative emotions, causes the release of ACTH (adrenocorticotropin hormone), a polypeptide located in the anterior lobe of the

pituitary. ACTH signals the adrenals to secrete cortisol, which cooperates with norepinephrine and epinephrine to prepare the body for “fight or flight.”

Norepinephrine and epinephrine (also known as noradrenaline and adrenaline) are both synthesized in the adrenal medulla from the amino acid tyrosine, and serve as neurotransmitters in the brain and in the autonomic nervous system.

The stress response, as defined by the late physiologist Hans Selye, is a built-in mechanism designed to protect us from damage. Selye defined human reaction to any form of stress as “General Adaptation Syndrome” (GAS), and proposed that GAS consisted of three stages of progression: (1) the alarm phase, (2) the adaptation phase, and (3) the exhaustion phase.

Diseases and injury mainly appear in the exhaustion phase, when, due to depletion and lowered resistance, the body loses its ability to manage the effects of stress.

In the alarm stage, when a muscle in the body is constantly overworked, soreness is common, followed by stiffness and inflammation. In a state of optimum health, when the body is strong and well nourished, such symptoms will quickly pass and the muscle will return to its previous state of wellness, thanks to the body’s self-regulating healing mechanisms.

If the muscle is continuously overworked, and there is additional stress (for instance, work-related stress), the muscle will eventually start to adapt to all of the repetitive stress factors. Eventually, the whole body will begin adapting in the same manner, at which point the second or “resistance stage” begins.

At first, the resistance stage does not normally present any specific set of symptoms; it can last for many years, even decades. In fact, the resistance stage will last for as many years as the body’s resources and reserves will allow, while the body attempts to heal itself. Ability to continue to adapt and resist varies from person to person, and depends on many factors: genetic make-up, quality of diet, rest and sleep, current emotional trauma, injury, illness, medication and surgery.

Most people get used to the resistance stage and begin to attribute symptoms like fatigue, chronic pain, headaches and the accumulation of body fat to the normal aging process, but nothing could be further from the truth. What appears to be inevitable is actually a deviation from what is possible when health of mind, and body, are present.

As we continue to cope with the many subtle and complex stresses of life, be they structural, biochemical or emotional, it is at the end of the resistance stage, when the adaptive mechanisms begin to fail, that the final stage of Selye’s model results in the “exhaustion stage.” At this point, ability to cope with stress diminishes to the point where chronic disease sets in.

To really understand the progression of the general adaptation syndrome, once again, consider the overworked muscle. When the muscle is first overworked, the alarm stage manifests as pain, stiffness, and perhaps inflammation. If this overwork

becomes chronic and the symptoms of the alarm stage are ignored or anesthetized, the resistance stage follows. During this stage, the muscle becomes increasing less elastic and more fibrous, placing stress on sites where tendon is attached to bone. This creates additional pain, interferes with athletic ability, and places extra stress on the joints. Left untreated, the muscle will eventually enter into the exhaustion stage, with impediment of movement, calcification, erosion of collagen and cartilage, inflammation, and possibly degeneration into a chronic disease, such as fibromyalgia or arthritis.

One way to define health is by the balance between life's stresses and the resources we have to cope with them. Tip the scales in the wrong direction for too long, and we burn out. Tip the scales in favor of health and restoration, with adequate rest, optimum nutrition, and routine exercise, and we protect ourselves against exhaustion and disease

Plan:

General:

An important part of any abnormal stress response, should include identifying and reducing the cause(s) of stress. The body interprets physiological stressors, such as lack of sleep, imbalanced blood sugar levels or intensive athletic training, in the same way as psychological stress due to bereavement or divorce for example. Adrenal function is significantly influenced by blood sugar levels, therefore much of the dietary advice below aims to stabilise levels of sugar in the blood.

Dietary:

- Never skip meals! Ensure that you eat at least every 3 or 4 hours, taking healthy snacks as necessary. Small, regular meals help to maintain energy levels and mood, while decreasing tiredness, irritability and fat storage.
- Avoid highly refined foods such as white bread/ pasta/ rice, chocolate, biscuits, sweets or anything with added sugars. Hidden sugars are also included in many cereals, breads, tinned produce, and processed/ packaged foods. Replace processed foods with the unrefined foods, such as wholemeal bread, brown rice, oats and rye. Note that excess alcohol can also cause imbalanced blood sugar levels.
- Tropical fruit (melon, grapes, banana etc), dried fruit and fruit juices can also be very sugary, therefore a limited intake of these may be warranted. Instead include other fruit such as cherries, berries, apples and pears, which are less 'sweet'.
- Ensure plenty of protein, such as lean meat, chicken, fish, eggs, beans, lentils, nuts and seeds, are included with each meal. Protein helps to slow the release of sugar into the blood stream.
- Stimulants such as tea, coffee and cigarettes may provide a temporary energy boost, however these not only deplete many essential nutrients, but always reduce energy levels in the long run. Aim to drink at least 1 - 1½ litres of filtered/ bottled water throughout the day, which can include herbal teas.

- Nutrients that specifically support the adrenal glands are vitamin C, found in most fresh fruit and vegetables. Magnesium is dramatically depleted in times of stress, and symptoms of a deficiency often include fatigue, anxiety, insomnia and a predisposition to stress. Include plenty of dark green leafy vegetables, wholegrains, nuts and seeds to supply adequate levels of magnesium. The B-complex vitamins can help to support adrenal function, particularly vitamin B5, which directly supports adrenal cortex function and hormone production. Sources include wholegrains, nuts and seeds. Various herbal adrenal tonics may also be beneficial.

Lifestyle:

- Good quality sleep is of utmost importance for long-term health and regeneration. Few people can cope with less than 7 or 8 hours of sleep per night, and those who regularly undersleep are almost always less efficient, not more. To promote proper sleep, keep regular sleeping patterns and ensure the bedroom is dark enough with adequate ventilation. Do not work in the bedroom.

- Make sure that food is eaten in a relaxed environment, and chewed thoroughly to promote optimum digestion and absorption of nutrients.

- Regular exercise is very beneficial for relieving stress and decreasing negative emotions such as worry or anxiety. However in patients with significantly depleted adrenal hormones, intensive cardiovascular exercise will further deplete adrenal reserves. Gentle exercises such as yoga, pilates, swimming and brisk walking are all excellent alternatives and are often calming in themselves.

- Regular relaxation needs to be built into ones daily life. Reading, bathing, massage and listening to music can promote relaxation, but watching the TV does not! Activities such as tai chi and meditation are extremely beneficial at reducing stress.

- Counselling or other therapies may be beneficial for those having to cope in the face of severe stressors.