

# “Taking the **STRESS** off of Steroid Hormones”

*In today's society, it seems almost laughable to dream of a typical 24 hour day to soar by without an injection of some sort of stress. For many of us, stressful situations are part of our daily rhythm, and our poor bodies take the full force of the blow. What happens to our anatomy and physiology when stress takes its ugly tole and how much can our bodies take? Unfortunately, very bad things happen, and as a result of stress over time, health issues become a concern and doctor visits become more frequent.*

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## **Stress and Cortisol**

The human body has a very interesting way of reacting to physical and mental stress. Whether the stress comes from psychological stresses such as clinical depression, or physiological stressors such as fear, pain, physical trauma, illness fever, or extreme temperatures, the same thing happens to all of our physiology. We release a fascinating little steroid called *cortisol*. Cortisol is a glucocorticoid (corticosteroid hormone) produced by the adrenal cortex that is responsible for a slew of various actions, all focused on the goal of restoring homeostasis after stress. One major attribute that this "stress hormone" is known for is its resultant increasing of blood pressure, blood sugar, and diminishing immune responsiveness. Beside cortisol's antagonizing influence on insulin, dumbing down producer T-cells, and turbo-charging epinephrine and norepinephrine, it also has another unfortunate physiological effect.. obesity. Some studies suggest that the activation of cortisone within adipose tissue might be a mechanism for contributing to adipocyte hypertrophy and visceral obesity (Mi-Jeong L. et al., 2008). It doesn't make matters any better either in trying to reduce stress and anxiety when cortisol is in circulation in high amounts. When we stress, panic, or get anxious, our bodies secrete fight-or-flight catecholamines (namely epinephrine and norepinephrine). Cortisol enhances our bodies' sensitivity to these bio amphetamines by the upregulation of their respective receptors (Daliao Xiao et al., 2003), thus increasing blood pressure, blood sugar, heart rate, etc. When we all are trying to avoid stress responses in our daily lives, cortisol can be a very unwelcome visitor.

## **"How can Corti-Edge help?"**

Viva Vitamins' Corti-Edge has put together a team of vitamins, minerals, amino acids, herbal extracts and other phyto nutrients that

are directly involved in combating the physiological wear and tear that cortisol brings about on our bodies. Researchers at Viva Vitamins have discovered what these amazing phyto-medicines do to achieve this. Although the exact mechanisms are not fully understood, ascorbic acid (Vitamin C) has shown much promise in recent studies to lower the amount of serum cortisol after physical stress via possible inhibition of post ACTH stimulation of adrenal cortex cortisol secretion in mega doses (Joseph M. et al., 1998). The wonderful thing about ascorbic acid is its safety in large doses without toxicological side effects. Calcium is strategically added to Corti-Edge due to cortisol-mediated inhibition of acid-induced, cell-mediated osteoclastic bone resorption through a decrease in osteoblastic PGE<sub>2</sub> production (Nancy S. et al., 2002). This means that cortisol may contribute to interruptions in normal bone remodeling. Cortisol also seems to counteract insulin. It does this by increasing gluconeogenesis and promoting breakdown of lipids (lipolysis), and proteins, and mobilization of extrahepatic amino acids and ketone bodies. Cortisol also initiates glycogen breakdown in the liver (Freeman S., 2002) which is a great danger to diabetics or anyone else at risk of hyperglycemia. Luckily, trivalent chromium has the amazing ability to improve insulin binding, insulin receptor number, insulin internalization, beta cell sensitivity and insulin receptor-coupled enzymes with overall increases in insulin sensitivity (Anderson RA., 1997). Corti-Edge contains a proprietary blend of phyto-medicinals named *Solver1*, which contain: Magnolia Bark extract (1.5% honokiol) and it's neuroprotective actions (Fukayama Y et al., 2002), beta-Sitosterol which has been shown in many recent studies to decrease biosynthesis of cortisol in human models (Bouic PJ et al., 1999), and last but not least, L-theanine. This little amino acid really packs a punch in dealing with

stress. Theanine is speculated to produce its anxiolytic effects by increasing the level of gamma-aminobutyric acid (GABA) production. It has also been shown to increase brain serotonin, dopamine, GABA levels and has micromolar affinity for AMPA, Kainate and NMDA receptors (Nathan P et al., 2006), mildly antagonizing these excitatory receptors to keep us all from "flying off the handle". Corti-Edge also contains a powerful duo of plant extracts named *Solver 2*, which provides: green tea leaf extract, containing 50% epigallocatechin gallate (EGCG), which may play a role in the control of body adipose tissue composition via sympathetic activation of thermogenesis, fat oxidation, or both (Dulloo AG. et al., 1999), and bitter orange peel extract (yielding 5% synephrine) which has been demonstrated to have exceptional lipolysing properties in adipose tissue via  $\beta_3$  adrenoceptive stimulation (Carpéné C et al., 1999) while having high  $K_m$  values (low affinity) for alpha adrenoceptors in skeletal muscle tissue. So this means lipolysis, without the jitters. This is definitely good news regarding the undesirable weight-gaining effects of excess cortisol. Last but not least, comes *Solver 3*, containing: banaba leaf extract (1% corosolic acid), which helps counteract the potentially life-threatening effects of cortisol by decreasing the degradation of liver glycogen resulting in elevated blood sugar (Wen X et al., 2005), and vanadyl sulfate, which works hand in hand with banaba leaf extract in controlling blood sugar (Boden, G. et al 1996).

### Purpose

Viva Vitamins' Corti-Edge is scientifically designed to give our bodies a defense against the potential threat that stress-induced steroids can assume. Physiological or psychological stressors can creep into our lives, sometimes undetected. The short and long-term effects of cortisol on our bodies can not only be a potential health concern, but life threatening. Corti-Edge is ready to stand up and fight against the physiological damage that stress puts on us by teaming up the best that nature has to offer. By Corti-Edge's careful formulation of the right vitamins, minerals, amino acids, herbs, and phyto nutrients, cortisol becomes less and less of the heavyweight contender it used to be in the battle over our well-being.

### References:

- Mi-Jeong Lee, Susan K. Fried, Steven S. Mundt, Yanxin Wang, Sean Sullivan, Alice Stefanni, Bruce L. Daugherty and Anne Hermanowski-Vosatka *Depot-specific Regulation of the Conversion of Cortisone to Cortisol in Human Adipose Tissue*. Obesity (2008) 16 6, 1178–1185. doi:10.1038/oby.2008.207
- Nancy S. Krieger, Kevin K. Frick and David A. Bushinsky *Cortisol Inhibits Acid-Induced Bone Resorption In Vitro* Department of Medicine, Nephrology Unit, University of Rochester School of Medicine, Rochester, New York J Am Soc Nephrol 13:2534-2539, 2002
- Joseph Marsit et al., *Effects of Ascorbic Acid on Serum Cortisol and Testosterone: Cortisol Ratio in Junior Elite Weightlifters*, Journal of Strength and Conditioning Research, 12: 179-184, 1998.
- Freeman, Scott (2002). Biological Science. Prentice Hall; 2nd Pkg edition (December 30, 2004).
- R. A. Anderson Nutritional; factors *influencing the glucose/insulin system: chromium*. Journal of the American College of Nutrition, Vol 16, Issue 5 404-410, 1997.
- Daliao Xiao, Xiaohui Huang, William J. Pearce, Lawrence D. Longo, and Lubo Zhang *Effect of cortisol on norepinephrine-mediated contractions in ovine uterine arteries* Am J Physiol Heart Circ Physiol 284: H1142-H1151, 2003
- Fukuyama Y, Nakade K, Minoshima Y, Yokoyama R, Zhai H, Mitsumoto Y. *Neurotrophic activity of honokiol on the cultures of fetal rat cortical neurons*. Bioorg Med Chem Lett. 2002 Apr 22;12(8):1163-6.
- Bouic PJ, Clark A, Lamprecht J, Freestone M, Pool EJ, Liebenberg RW, Kotze D, van Jaarsveld PP. *The effects of B-sitosterol (BSS) and B-sitosterol glucoside (BSSG) mixture on selected immune parameters of marathon runners: inhibition of post marathon immune suppression and inflammation*. Int J Sports Med. 1999 May;20(4):258-62
- Nathan P, Lu K, Gray M, Oliver C (2006). "The neuropharmacology of L-theanine(N-ethyl-L-glutamine): a possible neuroprotective and cognitive enhancing agent". J Herb Pharmacother 6 (2): 21–30
- Dulloo AG, Duret C, Rohrer D, et al. *Efficacy of a green tea extract rich in catechin polyphenols and caffeine in increasing 24-h energy expenditure and fat oxidation in humans*. Am J Clin Nutr 1999;70(6):1040-50.
- Carpéné C, Galitzky J, Fontana E, Atgié C, Lafontan M, Berlan M (April 1999). "Selective activation of beta3-adrenoceptors by octopamine: comparative studies in mammalian fat cells". Naunyn Schmiedebergs Arch. Pharmacol. 359 (4): 310–21
- Wen X, Sun H, Liu J, Wu G, Zhang L, Wu X, Ni P *Pentacyclic triterpenes. Part 1: the first examples of naturally occurring pentacyclic triterpenes as a new class of inhibitors of glycogen phosphorylases* Bioorg Med Chem Lett. 2005 Nov 15;15(22):4944-8
- Boden, G, et al (1996;). "Effects of vanadyl sulfate on carbohydrate and lipid metabolism in patients with non-insulin dependent diabetes mellitus.". Metabolism 45: 1130–5.