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Cortisol: The Aging Hormone, the Stupid Hormone

To the Editor:

At an anti-aging conference in Las Vegas, reported to be the largest in history, Dharma Khalsa, MD, outlined strong evidence for the role of cortisol in memory dysfunction, preventing the uptake of glucose and inhibiting synaptic transmission, neuron injury, and brain cell death.¹

Blacks frequently experience more stressful living conditions, perhaps even producing higher cortisol levels than other races. The average person secretes between 5 and 28 mg/day in an amazing day/night rhythm, reaching the highest peak around 8 AM to enable one to handle the stress of waking, rising, preparing for work, travel,

and everyday functions. Around 8 PM, levels reach their lowest peak, perhaps because the hormone inhibits tissue repair, such as rebuilding of the ground substance of the connective tissue that bathes cells. All of this general maintenance and repair of the body can only proceed when there are low levels of cortisol. Perhaps this is why stress, particularly at nighttime, can have a profound effect in weakening the body and preventing general maintenance. In support, researchers have found significantly increased nighttime cortisol levels, particularly in elderly men, perhaps linked to wakening to empty the bladder or other stressful events such as insomnia.²

Cortisol is an astonishingly powerful and life-saving hormone, responsive within minutes to a variety of stresses such as trauma, surgery, exercise, anxiety, and depression. The exact way in which it protects the body from stress is not fully understood. The hormone has a dark side, causing involution of the thymus, depression of immune response, and tissue damage. It can make a person weak, and it is associated with dementia, accelerates the breakdown of proteins, and leads to ugly fat deposits, particularly around the waist. Perhaps many of the misshapen figures, especially from the age of 40 on, are associated with excess cortisol from stress. In summary, an entire series of biochemical/physiological malfunctions occur in the presence of sustained high levels of cortisol.

NATURAL PROTECTION AGAINST STRESS

To protect the body against excess cortisol, approximately 90% of the circulating hormone is bound to serum proteins. The remainder is the unbound or "free active"

hormone. The serum carrier glycoprotein, transcortin (cortisol-binding globulin), binds approximately 60% of cortisol, and it is estimated that 10% to 20% is loosely attached to albumin.³

With higher plasma cortisol concentrations, particularly under stressful conditions, there is an increasing proportion of albumin-bound cortisol, acting as a safety buffer, mopping up excess dangerous cortisol, and serving as a reservoir of this life-saving substance to protect against emergencies and also to prevent deactivation by the liver, filtration by the kidneys, and unwanted access to the central nervous system.

A powerful example of cortisol as the aging hormone is in the observation of the Pacific salmon. During their astonishing migration up rivers, combined with fighting and sexual activity, cortisol is produced fourfold, resulting in rapid aging and universal death within a few weeks. Clearly, fish taken from this environment and prevented from producing excess cortisol live much longer.

SUMMARY

The protection against stress in all creatures, including humans, is to have the maximum circulating level of serum albumin. Over the last 15 years, I have seen humans and other animals endure highly stressful situations easily when there are high circulating levels of albumin. Transcortin is easily saturated and binds cortisol too tightly to give an immediate release in times of emergencies.⁴ All of this forms part of what is often referred to as the "devil's circle." Higher levels of antibodies and acute phase proteins cause the liver to make less and less albumin, yet there is more

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and more stress, and more cortisol and finally, greater side effects. In blacks, serum albumin is consistently 3 g/L lower than in whites.^{5,6} African Americans also have higher levels of serum antibodies on average by approximately 3 g/L.⁷ Clearly, these differences are not genetic, but environmental; given the same conditions, blacks have serum albumin levels at least equal to other races. Serum albumin levels are now regarded to be the best biomarker in aging.

All of this means that blacks are subject more often to the "devil's circle." Breaking this vicious circle may be achieved only by super hygiene techniques because it addresses the defense protein levels, thereby allowing more "osmotic room" in the blood to maintain

optimal albumin levels (48 g/L) throughout life. During the last 15 years, I have seen the benefits of better, scientific techniques of personal hygiene; specifically, cleaning the fingernails, skin, hair, eyes, and front of the nasal passageway on a daily basis reduces immunoglobins by an average of 4 g/L, thereby raising albumin 4 g/L, even in the elderly. High serum albumin levels also may reduce the side effects from administering corticosteroids.

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