Working together for the Greater Good – the HPA Axis and Reflexology

In this essay, we see how the body's response to stress and its ability to calm down are closely monitored and regulated by the cooperation of three vital glands. Getting the body to effectively communicate is something that the HPA Axis and Reflexology have in common, as Lee Anthony Taylor explains.

What is the HPA Axis?

The HPA Axis is a collective term for the feedback circuit that exists between three of the endocrine glands. It is a major neuroendocrine system that controls reactions to stress and regulates many body processes, including digestion, the immune system, mood and emotions, and sexuality.

A delicate relationship exists within the endocrine system and any imbalance between the hypothalamus, pituitary, and the adrenals spells trouble. The HPA Axis seeks to restore balance and homeostasis through constant communication and internal self-correction.

The axis is involved in the neurobiology of mood disorders and functional illnesses, including anxiety disorders, bipolar disorders, PTSD, ADHD, adrenal burnout, chronic fatigue syndrome, fibromyalgia, irritable bowel syndrome and alcohol poisoning. Antidepressants, which are routinely prescribed for many of these illnesses, serve to regulate HPA axis function.

The Mechanism of the HPA Axis

The HPA Axis has a cascade effect within the endocrine system, which monitors and acts upon differing forms of psychological stress (including the fight or flight response), but it can also overload the system and bring about chronic stress.

A feedback loop exists among the components of the HPA axis and the SNS. The hypothalamus contains neuroendocrine neurons that synthesize and release vasopressin —a hormone that acts in the HPA axis as a vasoconstrictor—and corticotropin releasing hormone (CRH).

CRH and vasopressin are released from nerve terminals. CRH gets transported to the anterior pituitary through the circulatory system and vasopressin is transported by neural axons to the anterior pituitary. There, CRH and vasopressin act to stimulate the secretion of ACTH from the cells where it is synthesized. ACTH is then transported through the circulatory system to the adrenal cortex where it promotes the production of corticosteroids like cortisol. Glucocorticoids have many important functions, including the modulation of stress reactions, but in excess they may be damaging.

What is its Role in Fight or Flight?

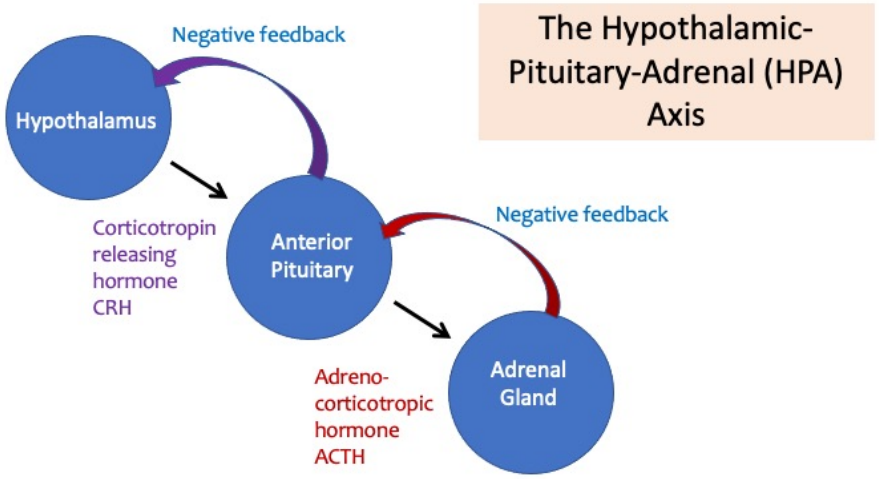
The body's stress response is regulated by the cooperation between the sympathetic nervous system (SNS) and the HPA axis. A complex interaction of direct influences and indirect feedback mechanisms among the SNS, the hypothalamus, the pituitary gland and the adrenal glands contributes to the neuroendocrine regulation involved in reactions to stress.

Sympathetic Component

The SNS plays a key role in regulating the neural response to stress known as the fight-or-flight response. This response involves the secretion of acetylcholine from the adrenal medulla, which activates the release of adrenaline and noradrenaline from the medulla and acts primarily on the cardiovascular system.

HPA Axis Component

The fight-or-flight response refers to the physiological changes made by the body upon sensing a threat. When this happens, the brain stimulates the hypothalamus to secrete corticotropin-releasing hormone (CRT) that provokes adrenocorticotropic hormone (ACTH) from the pituitary to stimulate the release of cortisol from the adrenal cortex to increase blood sugar levels in preparation for fight or flight.



Simultaneously, the adrenal gland also releases adrenaline into the blood stream. Various hormone receptors exist around the body that allow for an immediate physiological response including the following:

⇒ Acceleration in the action of the heart and lungs
⇒ Inhibition of digestive function
⇒ General effect on the sphincters of the body
⇒ Widespread vasoconstriction
⇒ Release of glucose for muscles
⇒ Dilation of the blood vessels for muscles
⇒ Relaxation of the bladder
⇒ Inhibition of an erection
⇒ Tunnel vision (loss of peripheral vision)
⇒ Shaking

Once the stressor has been removed, physiological changes occur which return the body state to a pre-stressed state of normality. Levels of blood cortisol are registered in the hypothalamus and the hippocampus via signals in the negative feedback loop and the production of CRH and ACTH is switched off.

However, some long-term stress episodes can induce an exaggerated and unnecessary continual fight-or-flight response, where the person is in a constant state of high alert, and the negative feedback circuit is not signalling correctly. Disproportionate stress responses are sometimes a result of mental disorders, such as post-traumatic stress disorder (PTSD) - a stress response when remembering a past trauma - or from a repeated series of panic attacks, in which the stress response is activated by the catastrophic misinterpretations of bodily sensations.

The Hypothalamic-Pituitary-Adrenal Axis in Depression

In depression, the hypothalamic-pituitary-adrenal (HPA) axis has interference in its negative feedback controls. Corticotropin-releasing hormone (CRH) is over-secreted from the hypothalamus and provokes the continued release of adrenocorticotropin hormone (ACTH) from the pituitary.

Excess cortisol release causes the cortisol receptors to become desensitized, which provokes an increase in activity of inflammatory markers and disturbances in neurotransmitter transmission. Prolonged stress responses may result in chronic suppression of the immune system, leaving the body open to infections.

The stressor slows down sexual responses and the digestive process, to focus on the threat. This typically causes constipation, difficulty urinating, and difficulty maintaining sexual arousal. This is explained in part by the fact that these are parasympathetic functions being suppressed by sympathetic excitement.

The Bonding Principle within Reflexology

Reflexology has a vital role to play in helping to improve communication within the HPA Axis. As therapists we encourage energy to move around the body, redistributing it from areas of excess to areas of deficiency. We visualise that, just like the feedback loop idea that exists within the HPA Axis, various body parts are communicating with each other energetically.

At a chemical level, we are seeking to improve function of all of the endocrine glands, individually and collectively, using reflexology.

At the level of the parasympathetic response, we can help reduce sympathetic overactivity, bringing about relaxation and breaking the cycle of the disproportionate stress response.

I developed the concept of bonding together reflex points – to create an energetic 'contract' so they reciprocate and help each other, keeping the channels of communication open. This technique has been employed on all kinds of illnesses, from cancer to fibromyalgia, by my students worldwide.

In particular, the technique of ***Endocrine Communication*** that I have developed and taught since 1998, uses the principle of encouraging all parts of the hormonal system to feedback to each other.
The photograph here shows the bonding together of the pituitary/hypothalamus and adrenal glands – the HPA Axis.