

Epigenetics and Stress

By Laura Hanson, D.C., D.I.C.C.P.

The past medical history is a vital tool in assessing the well being of children. It is critical to understand the health of the parents at the time of conception. The focus of this paper is to look closely at the adrenals and the thyroid function during pregnancy. Science has made strong claims regarding outcome for adults and children. If you are presently over the age of 30 there is a greater predisposition to acquire an adult-onset diagnosis such as, diabetes, autoimmune, endocrine, obesity, depression and cancer. If you are under the age of 30 there is a greater predisposition for the child never to get wired up correctly.¹

Perhaps there is a correlation between the past and the future as to why so many children are not developing optimally. The present state of children's health is not solely centered on autism, asperger, PDD, OCD, ODD etcetera... children's health is not flourishing, thriving, reaching optimal potential. According to National Institute for Literacy, 30-50% of the population have learning disabilities.² The degree of disability is not identified but reflective in altered learning strategies. Looking at this statistic, a community can appreciate the true perception of well-being in our children. Children go to school to learn. Going to school is their full-time job. As clinicians, we would look at any patient's job for cues on their chief complaint. Understanding that there is a break down in their ability to learn is a 'red-flag' meriting deeper investigation into their neurological function.

Neurology extends not only into the integration of motor function, but also into the fuel that runs the physiology of human existence. As a chiropractor, the vertebral subluxation complex addresses the chemistry not only through neurology, but also through the history component. The past medical history is a blue print as to how this little life was influenced prior to entering the world and presently.



Dr Laura Hanson

Focus a moment on the 'familial history' of your initial examination. The health of the mother and father cannot be left to only their perception of their health. Health or wellness is quite subjective. As the clinician, we have to investigate. We have to ask tough question if we are truly going to get to the root cause of discoordination regardless of what end of the spectrum it exists.

Detailing the mother's history should include her health quotient at least one year prior to conception. Determining a history of fatigue, frequent headaches and diminished immune responses or over active immune responses, sleep disturbances, vascular issues, erratic eating, visual disturbances, cravings, sensitivities or allergies and gut issues etcetera begin to demonstrate symptoms of adrenal stress. Unfortunately, not all labs reveal low functioning areas and therefore, asking the patient about perceptions may influence the clinician's direction.

Stress, regardless of origin, mechanical, chemical, or emotional, are perceived by the sympathetic adrenal medullary system (SAM)

forwarding commands to the hypothalamic pituitary-adrenal axis (HPA) to launch assistance to handle the stress.³ There are additional connectors to the limbic system as well as the thyroid, just to name two. The point is stress is far reaching. The response to stress needs to be turned off: fetuses are not the only ones that can experience epigenetic changes. Genes are expressing throughout life and will respond to the environment pushed on them.

Now, if you bring a chronically firing cavalry into pregnancy, fetal outcomes are altered and may be altered permanently. Yes, thank goodness for plasticity and the ability to change brain function and neurological responses. However, how many times have you asked the patient to comply with a particular regime and they have not. Plasticity will continue to promote change but positively or negatively based on the environment provided.^{4,5} Change requires rolling up your sleeves and going to work.

We have to find the shortest and most powerful approaches to keep management mainstream. Look to the past for help. The past is only one part, as neurological function is one part; bring the parts together. Adrenal dysfunction can be passed to the unborn child.⁶ Timing of chronic stress indicates a greater connection of transmission. Women experiencing adrenal exhaustion during the third trimester will take adrenal hormones from the fetus. Linking adrenal changes, altered HPA axis function and inflammatory changes in the brain revealed in scientific literature has been found in children diagnosed autistic.

Timing is a very important element to detail throughout the personal history of your patient. For example, research has identified changes in growth as it relates to the fetal response to nutrition. There is a symmetrical growth restriction during the first trimester and an asymmetrical growth restriction during

the third trimester. The paper further stated that the unborn child perceives poor nutritional quality and quantity the same way it would perceive any stressful event.⁷

The mental perception of a loss is rated the number one emotional stress. Loss is associated not only with the death of a loved one but a 'loss' to you. Loss of relationship, loss of a job, loss of your identity; any of these and a multitude of other human experiences can play with the mental well-being of any woman. The previous loss of a baby can be easily translated to the next pregnancy.⁸ There are many other emotional factors affecting women especially while they are pregnant. Our job is to provide support, direction and chiropractic care.

Regardless the portal of entry chronic stress is having a negative affect on fetal outcome. Chronic adrenal stress affects the communication between brain and the endocrine glands. The pituitary and hypothalamus regulate hormone production. Chronic stress leads to an excess of production of cortisol from the adrenal cortex, which will negatively inhibit feedback into the hypothalamus and the pituitary.⁹ This reaction will limit the communication between the hypothalamus and pituitary to the thyroid.

Loss of communication between the hypothalamus and pituitary to the thyroid will affect the conversion of T4 to T3 which is the predominate thyroid hormone used in the body. The conversion takes place in the liver, muscle, nerve cells and the heart. The cells take up T3; T3 is responsible for turning on and off genetic controls. A small portion of T4 is converted to T3 in the gut. The conversions into T3 are dependent on a healthy system.¹⁰

The thyroid gland controls how quickly the

body will use energy, maintains the body's temperature, controls how sensitive the body should be to other hormones, affects growth in children and affects emotion, memory and cognitive ability. The fetus begins to make thyroid-stimulating hormone by 8 weeks and thyroxine by week 10. Thyroid hormones appear to have their most profound effects on the terminal stages of brain differentiation, including synaptogenesis, growth of dendrites and axons, myelination and neuronal migration. Thyroid hormones act by binding to nuclear receptors and modulate transcription of responsive genes.

Today many people fall into the category of a low functioning thyroid. The majority of those individuals with low functioning thyroid are women. The thyroid may become dampened due to altered immune function, altered blood sugar metabolism, altered gut function, adrenal exhaustion and altered hormone production. Very interestingly, most individuals with low functioning thyroid have gluten sensitivity or allergy or even more probable a gluten-induced autoimmune disorder identified with the Human Leukocyte Antigen haploid genotype DQ (HLA DQ).¹¹

An autoimmune response to gliadin, the protein found in wheat and wheat like grains, attacks the thyroid. The molecular structure of gliadin closely resembles the thyroid gland. If the individual does have gluten sensitivities and ingest gluten an immune reaction is ignited. Chronic inflammation, from this source, will lead to an autoimmune response not only affecting the target tissue of the small intestines but the thyroid as well. In these cases, the individual must, must avoid gluten FOREVER. With pregnancy, altered thyroid function is typically passed down and this child should never, never be given gluten. Perhaps this is link between a gluten-free diet and uncoordinated children.

Many issues discussed are better served with a team approach. Connect with other providers

in your area to handle different components. Be the leader. Take the initiative. Bring your community together. Connect with other services: midwifery, organic baby food makers, pregnancy and infant massage, birthing classes' etcetera. Bring the services together to promote conscious parenting.

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