FLUIDS iQ®

RESULTS: SALIVA HORMONE TEST

Accession #: 100035199 • Patient: John Smith

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Patient: John Smith
Sex: Male **Age:** 18 yr **Date of Birth:** 2000-06-25
Height: 6 ft 1 in **Weight:** 140 lbs **Waist size:** 44 in

Hormones: No
Health Care Professional: John Smith
Address: 646 Petrolia Rd., Toronto, Ontario M3G 2W3

Accession #:	**100035199**
Sample received:	2019-03-20
Report issued:	2019-03-20
Sample collection:	
2019-03-17	07:30 AM
2019-03-17	13:45 PM
2019-03-17	18:30 PM
2019-03-17	22:00 PM

MALE WELLNESS DAILY CYCLE

17-β ESTRADIOL (E2) pg/ml — Above **6.5**

Reference range
Male 1.0 - 4.7 pg/ml

TESTOSTERONE (T) pg/ml — **9.5**

Age (years)	Male	Female (Reference ranges)
Less than 20	Range not applicable	
20 - 29	41.4 - 142.5	5.5 - 49.0 pg/ml
30 - 39	31.8 - 100.4	5.2 - 49.0 pg/ml
40 - 49	30.1 - 97.8	4.5 - 49.0 pg/ml
50 - 59	30.0 - 92.0	3.6 - 49.0 pg/ml
60 - 69	23.2 - 86.9	2.9 - 38.8 pg/ml
Greater than 69	Range not applicable	

DHEA-S (DS) ng/ml — **2.4**

Reference range
Male 0.2 - 2.7 ng/ml

CORTISOL (C) ng/ml

			Reference ranges
Morning	Above	56.1	1.6 - 12.6 ng/ml
Noon	Above	45.1	0.7 - 4.9 ng/ml
Afternoon	Above	65.1	0.6 - 3.8 ng/ml
Night	Above	78.5	0.3 - 2.9 ng/ml
TOTAL	Above	244.8	3.2 - 24.2 ng/ml

TOTAL C:DS RATIO — Above **104:1**

Reference range 5:1 to 6:1

The reference range is derived from a normal distribution of results that encompass 95% of randomly selected individuals in a population.

Dr. Aron Gonshor PhD, DDS, FRCD(C), FAO • Laboratory Director

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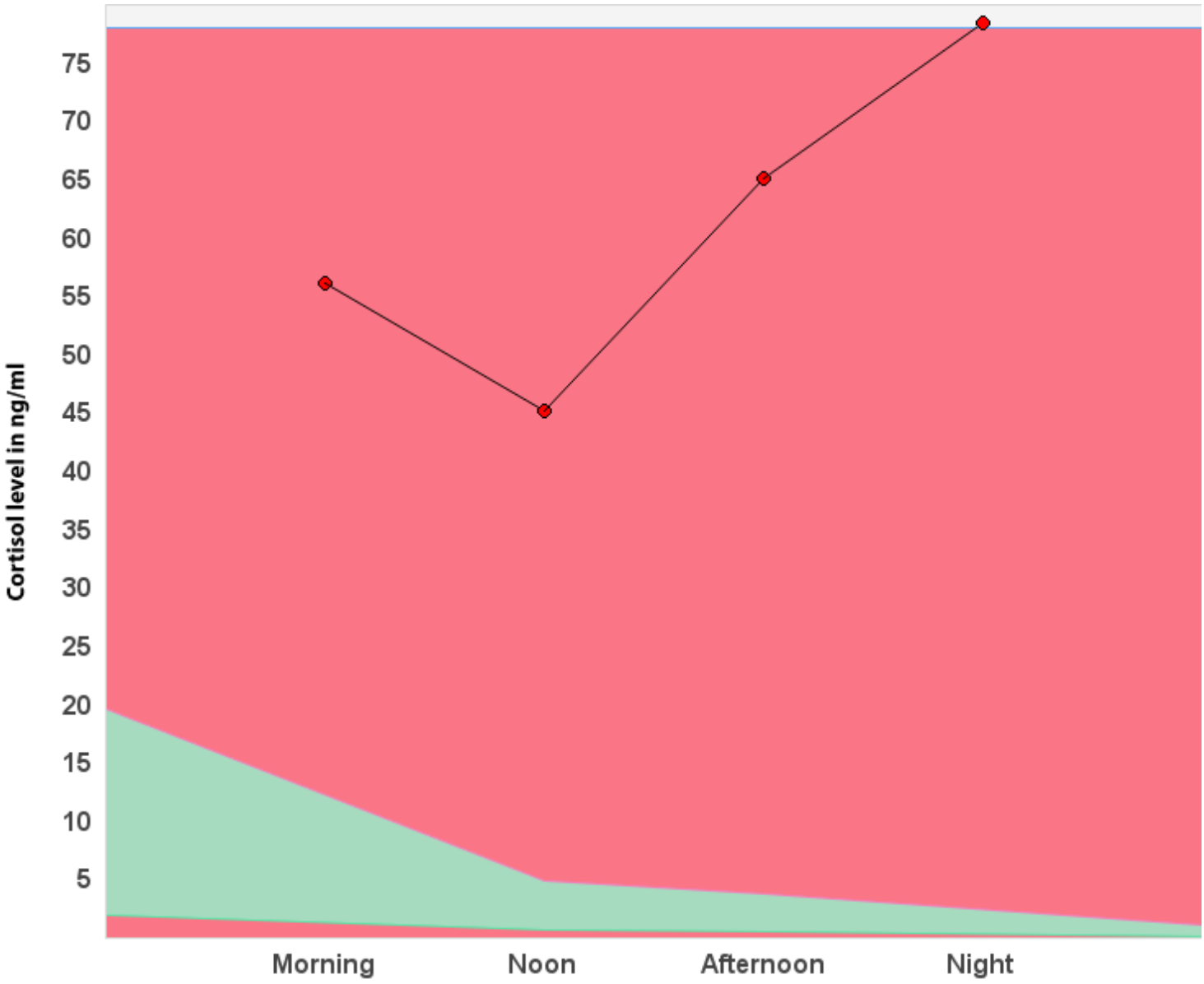

Green shade represents the normal range

◆ represents the patient results

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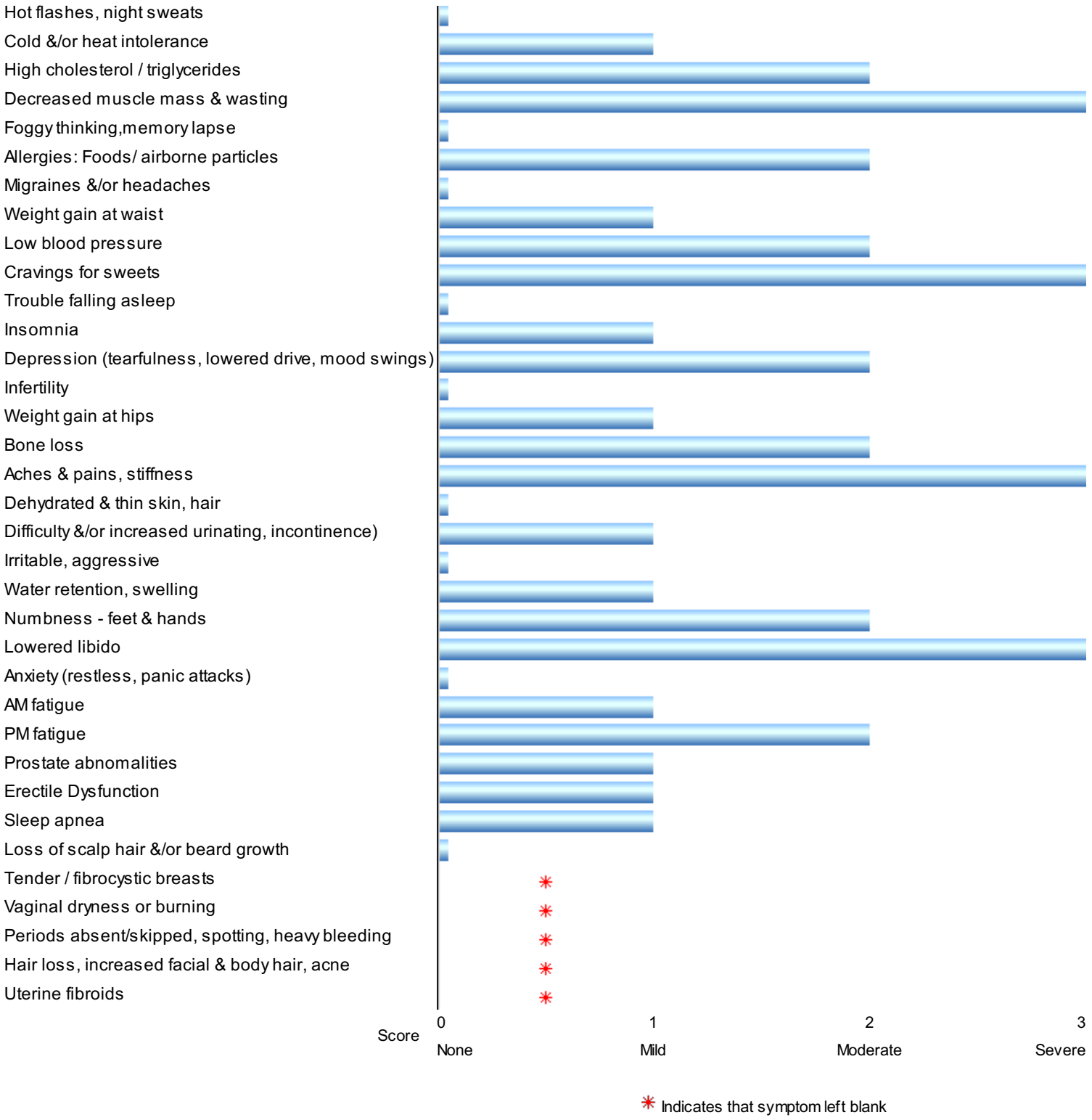

Understanding Hormone Excess and Deficiency

The comments provided here are for educational purposes only. They should not be interpreted as being diagnostic or treatment recommendations. Those decisions are the responsibility of the health care professional. Moreover, the reference range shown in this report is derived from a normal distribution of results that encompass 95% of randomly selected individuals in a population.

IN THE PRESENT TEST

CORTISOL

The Morning cortisol level exceeds the reference range. Those experiencing acute stress, or chronic stress and work overload, will exhibit levels exceeding the normal morning range. It may also be an indication of a pronounced 'awakening response', which can increase cortisol levels by over 30%, about 30 minutes after waking. This latter response is largely genetically determined and is independent of the natural circadian variations. Waking earlier than normal can also increase this response.

The Noon cortisol level exceeds the reference range. Too much glucocorticoid can occur from an exogenous or endogenous source. The exogenous cause is most often related to the taking of some form of 'steroid' medication. The endogenous cause is related to some form of adrenal hyperplasia, a benign tumour of the adrenal gland, or a pituitary adenoma (Cushing's Disease or Syndrome). Long-term treatment with steroids can also cause symptoms and problems similar to Cushing's Syndrome.

The Afternoon cortisol level exceeds the reference range. Too much glucocorticoid can occur from an exogenous or endogenous source.

The Nightime cortisol level exceeds the reference range. As with afternoon levels that exceed the normal range, this can be due to both exogenous and endogenous causes.

DHEA-S (Dehydroepiandosterone Sulphate)

DHEA-S lies within the reference range. DHEA, together with cortisol, plays an important role in maintaining normal blood glucose levels (glycemic control). Normal levels are important in proper metabolism of carbohydrates, fats and proteins.

General Discussion

CORTISOL

About Cortisol: Cortisol is produced by the adrenal glands, which are controlled by parts of the brain called the hypothalamus and pituitary. Cortisol plays an important role in breaking down glycogen to glucose in liver and muscle tissue. It mobilizes glucose, so as to maintain normal blood sugar levels, the primary energy source for the brain. Cortisol levels are highest in the early morning (approximately 8 am) and reach the lowest level about midnight to 4 am, or three to five hours after the onset of sleep. Diurnal cycles of cortisol levels are found in human saliva. Cortisol production comes in response to daily stress, as well as emotional upset, infections and surgery. It prevents the release of substances in the body that cause inflammation. It is used to treat conditions resulting from over activity of the B-cell-mediated antibody response. Examples include inflammatory and rheumatoid diseases, as well as allergies. Low-potency hydrocortisone, available as a non-prescription medicine in some countries, is used to treat skin problems such as rashes, and eczema[1, 2, 3].

Low Cortisol, especially if it remains so throughout the day, may indicate **Adrenal Exhaustion**, which is caused by stress, such as sleep deprivation, emotional stress, poor diet, nutrient deficiencies, and/or synthetic glucocorticoid medications that suppress cortisol production. Chronic stress depletes cortisol and is associated with symptoms of morning and evening fatigue, aches and pains, fibromyalgia, cold body temperature, decreased stamina, slow pulse rate, low blood sugar (sugar craving) and low blood pressure. In addition one often encounters increased allergies (immune dysfunction), and sensitivity to chemicals. Symptoms of thyroid deficiency can also be due to low cortisol levels. Exercise, more adequate sleep, a diet with adequate protein, 'bio-identical' progesterone, adrenal extracts and nutritional supplements are often helpful in correcting low cortisol.

High Cortisol. Although normal cortisol levels are essential for life, chronically elevated levels can be very detrimental. Increased cortisol production by the adrenals is a normal response to routine stress, but when stress is chronic and cortisol output remains high over a prolonged period (months/years), break- down of normal tissues (muscle wasting, thinning of skin, bone loss) and immune suppression can result. Common symptoms of chronic high cortisol include sleep disturbances, fatigue, depression and weight gain in the waist and anxiety. Stress and persistently elevated cortisol levels can contribute to premature aging and chronic illness.

ESTROGENS

(Estrone-E1, 17-β Estradiol-E2, Estriol-E3) Estrogens are the primary female sex hormones. They play important roles in stimulating growth of the reproductive tissues, maintaining healthy bones, increasing the levels of neurotransmitters in the brain and helping keep the cardiovascular system healthy. During menopause estrone is the predominant circulating estrogen and during pregnancy it is estriol. Though estriol is the most plentiful of the three estrogens it is also the weakest, whereas estradiol is the strongest, with a potency of approximately 80 times that of estriol. Thus, estradiol is the most important estrogen in non-pregnant females who are between the first menstruation (menarche) and menopause stages of life. However, during pregnancy this role shifts to estriol, and in postmenopausal women estrone becomes the primary form of estrogen in the body. All of the different forms of estrogen are synthesized from androgens, specifically testosterone and androstenedione.

Low Estradiol is unusual in premenopausal women, unless they have no ovulation, or are taking birth control pills, since the latter can suppress ovarian estrogen production. It is much more common in post-menopausal women whose ovaries were removed, or those who have not had hormone replacement. Symptoms and signs of low estrogen levels include sleep disturbances, foggy thinking, hot flashes, night sweats, vaginal dryness, thinning skin, incontinence, and heart palpitations.

High Estradiol in premenopausal women is usually due to over production of androgens by the adrenal glands and ovaries (DHEA and testosterone), or by estrogen replacement therapy (ERT). In postmenopausal women high estradiol levels are usually due to estrogen supplements. Excess estrogen levels, such as estradiol, even at normal premenopausal levels, when not balanced by adequate progesterone, may create what is referred to as "**Estrogen Dominance**". Symptoms may include irritability, anxiety, mood swings, weight gain at the hips, water retention, bleeding problems (due to uterine lining overgrowth and fibroids) and thyroid deficiency.

Estrogen in Females and Males:

Estrogen is considered to be the female hormone, whereas testosterone is considered the male hormone. However, both hormones are present in both sexes. The sexual distinctions are not qualitative differences, but rather result from quantitative divergence in hormone concentrations and differential expressions of steroid hormone receptors. In males, estrogen is present in low concentrations in blood, but can be extraordinarily high in semen; as high as 250 pg/ml in testicular fluids, which is higher than serum estradiol in the female. It is well known that male reproductive tissues have estrogen receptors, but the role of estrogen in male reproduction remains unclear.

Estrogen regulates the reabsorption of luminal fluid in the head of the epididymis. Disruption of this essential function causes sperm to enter the epididymis diluted, rather than concentrated, resulting in infertility. This finding raises further concern over the potential direct effects of environmental estrogens on male reproduction and reported declines in human sperm counts.

In males, the main biologically active estrogen is estradiol. The primary source of estradiol in men is from the conversion (aromatization) of testosterone by estrogen synthase. As men age, the production of androgens from the adrenals and gonads is decreased. The aromatization of testosterone to estradiol is often maintained, but due to a variety of factors, more testosterone is aromatized in fatty tissues, causing a further imbalance of the ratio of testosterone to estrogen; i.e. too much estradiol and not enough testosterone. The result is a deficiency of beneficial testosterone and an excess amount of estradiol.

As men age, the amount of testosterone produced in the testes diminishes greatly. Yet estradiol levels remain persistently high. The reason for this is increasing aromatase (estrogen synthase) activity along with age-associated fat mass, especially in the belly. Estradiol levels correlate significantly to body fat mass and more specifically to subcutaneous abdominal fat. The epidemic of abdominal obesity observed in aging men is associated with a constellation of degenerative disorders, including heart disease, diabetes, and cancer.

Subcutaneous abdominal fat acts as a secretory gland, often producing and emitting excessive levels of estradiol into an aging man's blood. One's waist circumference is a highly accurate prognostic measurement of future disease risk, with excess estradiol secretion being at least one of the deadly mechanisms associated with the difficult to resolve problem of having too much abdominal fat.

Symptoms of excess estrogen in aging men include the development of breasts, having too much abdominal weight, feeling tired, suffering loss of muscle mass, and having emotional disturbances. Many of these symptoms correspond to testosterone deficiency as well.

ANDROGENS

The endocrine glands secrete 5 androgens through a similar pathway: Testosterone, dehydroepiandrosterone (DHEA) and its sulphated form (DHEA-S), androstenedione, and androstenediol. Testosterone, and its biologically active metabolite dihydrotestosterone (DHT), are the only androgens with direct androgenic activity. DHEA-S, DHEA, and androstenedione are all precursors of testosterone.

a) TESTOSTERONE

Testosterone is considered the "male hormone". In men it is produced by the testes and in much smaller amounts by the ovaries in women. It is responsible for many of the secondary sex characteristics seen in men such as a deeper voice and hair on the chest, in addition to contributing to a healthy libido, regulating the immune system, maintaining optimal memory, building muscle mass, and maintaining energy levels. In both men and women testosterone levels are highest in the teens and then decline gradually with age, playing a role in the loss of bone density. In women, premenopausal testosterone levels are usually within the high-normal range and postmenopausal levels at low-normal range.

Low Testosterone is most often a result of aging, testes or ovary removal, suppression of ovarian and testicular production by stress hormones (cortisol), the use of synthetic HRT and contraceptives, and/or damage to the testes, ovaries, and adrenal glands by medications, radiation therapies, or trauma. Chronically low testosterone, in both sexes, may cause fatigue or decreased energy as well as reduced sex drive or desire (libido). In addition it may cause reduced stamina and the loss of bone and/or muscle mass, loss of body hair, incontinence, aches and pains, memory lapse, cognitive decline and depression. In women, testosterone imbalance has been associated with coronary heart disease and heart attacks (myocardial infarcts), especially in post-menopausal women. In men, testosterone levels decrease with age. While this decrease may not be noticeable in some men, others may experience significant changes starting in middle age, or more commonly at age 60 and above. This drop in testosterone levels is sometimes termed "male menopause", hypogonadism, or andropause.

Low testosterone levels may result in a decline in physical energy, strength, stamina, and diminished mental aggressiveness. These men may experience more aches and pains in the bones and joints and they may also have a decline in libido and a greater incidence of erectile dysfunction.

High Testosterone is the result of excess production by the ovaries, testes and adrenal glands, or androgen supplementation (testosterone, DHEA). In men high levels will manifest in increased scalp hair loss. The higher the levels the more likely these men will exhibit risky and aggressive behavior, whether sexual, injury risk, or criminal. Symptoms of high testosterone levels in premenopausal women include loss of scalp hair, increased body and facial hair, acne, and oily skin. Supplementation with topical testosterone at doses in excess of levels produced by the ovaries (0.3-1 mg) or testes (5-10 mg) can raise testosterone to levels beyond physiological range.

b) DHEA-S (Dehydroepiandrosterone Sulphate)

About DHEA: DHEA, a testosterone precursor, is the most abundant circulating steroid hormone. DHEA is produced predominately by the adrenal glands, the gonads, and the brain, where it functions predominantly as a metabolic intermediate in the biosynthesis of the androgen and estrogen sex steroids. DHEA-S is the sulphated form, and in blood it approaches levels 300 times that of free DHEA. Whereas DHEA levels are at a peak in the early morning, DHEA-S levels show no diurnal variation. From a practical point of view, measurement of DHEA-S is preferable to DHEA, as its levels are more stable. In the young the levels approach the high end of the range. They decrease with age and get to the lower end of normal in middle age.

Low DHEA-S can be caused by adrenal exhaustion and is commonly seen in accelerated aging and diseases such as cancer.

High DHEA-S can be associated with insulin resistance/PCOS[4] (polycystic ovaries) or DHEA supplementation.

TOTAL CORTISOL : DHEA-S RATIO

The normal ratio ranges from 5:1 to 6:1, and is an indicator of the adrenal output of cortisol and the androgens. It is age dependent, since there is a decline in DHEA-S with age, while the levels of morning cortisol remain relatively stable or increase slightly. If the ratio is higher than normal it is due to adrenal dysfunction. When the body experiences chronic stress, pregnenolone, the precursor to all other steroidal hormones, begins to overproduce cortisol (known as 'cortisol escape'). This is at the expense of all the other steroidal hormones (DHEA and its metabolites, including progesterone, testosterone, and the estrogens). As pregnenolone is diverted to cortisol, DHEA-S depletion begins. This creates an elevated cortisol to DHEA-S ratio. If the ratio is lower than normal for that age, and the DHEA-S level is within the normal range, it is probably due to the maintenance of DHEA-S output with advancing age. However, if the ratio for that age is lower than expected, it is probably due to high DHEA-S levels, low cortisol, or both of these.

METABOLIC SYNDROME

Metabolic syndrome is a disorder of energy utilization and storage, diagnosed by a co-occurrence of three out of five of the following medical conditions: abdominal (central-waist) obesity, elevated blood pressure, elevated fasting plasma glucose, high serum triglycerides, and low high-density cholesterol (HDL) levels. Metabolic syndrome increases the risk of developing diabetes and cardiovascular disease, particularly heart failure. Some studies have shown the prevalence in the USA to be an estimated 34% of the adult population, and the prevalence increases with age. Recent research indicates prolonged chronic stress can contribute to metabolic syndrome by disrupting the hormonal balance of the hypothalamic-pituitary-adrenal axis (HPA-axis)[5].

The principal signs and symptoms of metabolic syndrome are central obesity, also known as visceral overweight (male-pattern or apple-shaped adiposity), with fat (adipose) tissue accumulation mainly around the waist and trunk. Other signs of metabolic syndrome include high blood pressure, with decreased fasting serum HDL cholesterol and elevated fasting serum triglyceride level (VLDL triglyceride). It is often accompanied by impaired fasting glucose and insulin resistance, or pre-diabetes, which can manifest by numbness in the feet or hands.

HYPOMETABOLISM

Hypometabolism is not an illness in itself. It would better be termed a "condition", encompassing a variety of illnesses[6]. The characteristic of hypometabolism is that the biochemical processes of the body are functioning as fast as they should. Since the biochemical reactions of the body give off heat (exothermic), hypometabolism results in hypothermia, a lowered body temperature. While the enzymatic reactions of the body give off heat, the enzymes themselves are also dependent on body heat to have their most efficient action. When body temperature is below 98.2 degrees Fahrenheit, enzymes are not functioning at their best efficiency.

This enzymatic dysfunction produces a variety of signs and symptoms, which are common to all hypometabolic conditions. These include fatigue (AM and PM), cold and heat intolerance, migraines (headaches), depression and weight gain. Other symptoms include irritability, sleep disturbance such as insomnia, anxiety (panic attacks), as well as poor memory and concentration (foggy thinking). Many individuals experience irregular periods, low sex drive, low ambition and motivation. This may be accompanied by fluid retention, irritable bowel, hair loss, dry skin and hair and generalized muscle aches and joint pain.

References

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