

ATTACHMENT:

Useful remarks for patient and doctor, to be associated to the analytical results. Your doctor should interpret this report.

Cod. ID: 123456

CCV: 000

Date: 01/01/2014

Patient: Rossi Mario



Rapport de:

NatrixLab

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Aut.n. 67 del 26.01.10

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WEIGHT LOSS PROFILE (Assessment of hormone balance)

HORMONES AND SLIMMING

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GLUCAGON

GROWTH HORMONE

MORNING CORTISOL

EVENING CORTISOL

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HORMONES AND SLIMMING

Even when one is motivated and convinced in wishing to lose weight, the attempt is not always successful. Hormones are endogenous substances produced by the endocrine system, which act as messengers and which answer the various needs and requirements of the organism. Hormones are produced by glands inside the body, which secrete them according to the stimuli from the nervous system: in the central nervous system, the glands which secrete hormones are the hypothalamus and the hypophysis, at neck level, the parathyroid and thyroid, and in the abdomen, the adrenal glands, the pancreas and the sexual glands (ovaries in women, testicles in men). Every hormone has different functions and is secreted or activated only when necessary; for most of one's life, it circulates in the blood linked to proteins which keep it inactive but ready for use. The biological clock follows certain circadian rhythms, the light-dark and sleep-wake cycles, which, if not respected, can cause innumerable disturbances, as well as difficulty in losing weight.

Some hormones act in the mechanisms of appetite regulation and nutrient storage for energy purposes, and consequently in the weight loss and weight gain mechanisms. At times, it is sufficient to control hormones instead of calories in drawing up a diet.

Let's see what they are and how they work:

INSULIN

Insulin is the anabolic hormone which transfers glucose from the blood flow to the cells of the entire organism. It is secreted after the introduction of carbohydrates when eating and is proportional to their quantity. It is also produced by the beta cells of the pancreas and when it increases, the production of cholesterol and the storage of fats in the fat cells are also activated.

The properties of insulin are therefore to facilitate the passage:

- of the glucose from the blood to the cells, thus lowering the glycaemia level
- of amino acids from the blood to the cells, i.e. an anabolic function, since it stimulates the synthesis of protein inside the cells, including muscle cells
- of fatty acids from the blood to the cells, also stimulating the synthesis of fatty acids and inhibiting lipolysis.

Organ fat plays a leading role in the development of resistance to insulin, because it releases substances which contribute to the development of the same.

In overweight and obese subjects, the risk of developing insulin resistance, and consequently diabetes mellitus type II, doubles when the weight increases by 20% compared to the individual's ideal body mass index. With age, overweight and physical inactivity alters and increases the secretion of insulin.

GLUCAGON

This hormone, produced by the alpha cells of the pancreas, is the antagonist of insulin. It has a catabolic function, it promotes glycogenolysis, it stimulates the mobilisation of fats, i.e. lipolysis, and increases cardiac muscle contraction strength, stimulating the secretion of catecholamines. It gives stamina, ready-to-use energy and favours slimming because it stimulates the organism to burn stored fats. It is secreted in the case of a fall in glycaemia and during physical activity requiring the burning of energy.

GROWTH HORMONE (GH)

The GH is secreted by the anterior hypophysis, and it has more frequent peaks in the early hours of the night. As the name itself indicates, it is the hormone *par excellence* which favours the growth of the skeleton, since it increases protein synthesis and fixes the proteins in the muscles. However, it has other important functions:

- it favours the mobilisation and use of fats as a source of energy. In particular, it increases the oxidation of the fatty acids into ketone bodies, favouring weight loss;
- it decreases insulinemia and glycaemia, increasing the secretion of glucagon.

The secretion of GH is increased by the practice of sport, as well as by keeping the glycaemia level low by choosing meals prevalently of protein and with a low glycaemic load. In adults, GH guarantees muscular and bone nutrition, increasing the muscular mass and decreasing the fatty mass. Obese subjects have low GH production.

CORTISOL

Cortisol is produced by the adrenal glands in response to the pituitary hormone ACTH.

This hormone is also known as the "stress hormone" since increased levels are found in the case of strong psycho-physical stress or after very intense physical activity.

In order to preserve and prepare the organism to survive heavy stress conditions, the cortisol acts by increasing the cardiac range, glycaemia and hepatic gluconeogenesis, by stimulating the secretion of glucagon and by reducing the activity of the insulin. It also reduces the immune defences with an anti-inflammatory action. It accelerates and favours osteoporosis if the increase is chronic; it favours protein catabolism in the case of a shortage of sugars, and the mobilisation and use of fatty acids, although in some areas it stimulates lipogenesis: it stimulates the development of subcutaneous fat especially in the trunk and abdomen.

An increase of cortisol in circulation is also found in the case of prolonged fasting or incorrect eating habits. For example, missing breakfast or eating a very large single daily meal increases cortisol levels. A stable condition of excess cortisol can lead to high blood pressure, hair loss, muscular weakness and atrophy, alterations in the menstrual cycle, frequent infections, loss of libido, osteoporosis, head aches and depression.

DHEA

DHEA, or dehydroepiandrosterone, is a hormone produced by the adrenal gland in response to the pituitary hormone ACTH, starting from cholesterol. In fact, all the sexual hormones (testosterone, oestrogens, progesterone) and cortisol, derive from this hormone.

The main functions are:

- to regulate and stimulate the sexual functions, libido and the secondary sexual characteristics
- to stimulate the production of myelin, which is important for the protection of the nervous system
- to increase muscular and bone tissue nourishment
- to mobilise and use fats for energy purposes
- to increase basal metabolism, favouring weight loss
- to prevent osteoporosis and degenerative neurological diseases
- to slow down ageing and to increase long life

DHEA represents a counter-regulator of the action of cortisol and modulates the damaging effects induced by an excess of cortisol. The maximum secretion of DHEA occurs in puberty and continues until 25-30 years of age, after which it begins to decrease physiologically.

LEPTIN

Leptin inhibits appetite and increases energy consumption. Produced above all by white fat cells: they increase the secretion of this hormone when fat reserves increase. The increase of leptin sends a signal to the brain (to the hypothalamus) to reduce the intake of food. Hunger and the search for food are desires stimulated by a fall in the leptin and insulin levels in the plasma.

Apart from regulating appetite, it also regulates thyroid activity and it reinforces the immune system.

THYROID HORMONES

The thyroid hormones are secreted by the thyroid, a small endocrine gland positioned below the "Adam's apple", in response to **Thyreotropin (TSH)** produced by the hypophysis. The most important are **Triiodothyronine (T3)** and **Thyroxine (T4)**. The highest levels are secreted during the night and in the early morning, while they decrease considerably from the afternoon to the evening.

The main functions of these hormones are:

- to increase thermogenesis and basal metabolism, consequently increasing the daily caloric expenditure;
- to act on the regulation of the glucidic lipid metabolism;
- to increase protein synthesis and muscular nutrition, but if this is excessive, they lead to the contrary effect, i.e. muscular catabolism;
- to increase cardiac muscular contraction and blood pressure;

- to favour the absorption of vitamin B12 and iron.

The active form of the thyroid hormones is represented by T3, while T4 is about 15 times less active. Overweight and obesity increases the speed of the disposal of T3, thus metabolism slows down with a consequent risk of weight increase. In the case of hypothyroidism, basal metabolism falls by 40%, while on the contrary, in hyperthyroidism subjects, it increases by as much as 50%.

TESTOSTERONE

This is an androgenic hormone, produced by the sexual glands. It performs a fundamental activity during male development. In adults it favours the growth of body hair, maintenance of the secondary sexual characteristics and the onset of baldness. It maintains libido, stimulates spermatogenesis, the production of erythropoietin and muscular nutrition.

In male overweight and obesity, the levels of testosterone in plasma fall, with a corresponding increase in the oestrogen levels, because of the activity, at the adipose level, of aromatase enzyme which transforms the testosterone into estradiol. This greater presence of "female" hormones involves a partial redistribution of fat tissues on thighs and buttocks and gynaecomastia. In addition to these unpleasant effects, low concentrations of testosterone favour loss of muscle mass.

PROGESTERONE

This is a steroid hormone, derived from cholesterol. It is a female sexual hormone, responsible for ovulation, fertility and the menopause. Its concentration is very important in the embryo implantation phase and during the whole pregnancy. Concentrations are much lower, however, in the follicular phase and during menstruation. Furthermore, progesterone is a thermogenic hormone, i.e. favouring body temperature increase of about 1°C. Being secreted mainly in the post ovulation phase, women consume more calories in this phase of the cycle.

OESTROGENS

Female sexual hormones. Oestrogens stimulate the development of the secondary female characteristics, they allow for fecundation and pregnancy, and they regulate the menstrual cycle, as well as the distribution of body fat, favouring the deposit on hips, buttocks, thighs and abdomen. They exercise a protective action against osteoporosis; they protect against the cardiovascular and arteriosclerosis risk. They also stimulate lipolysis in the muscular and adipose tissue, and they regulate many brain functions such as memory. They also influence the thyroid hormones, with an antagonist action, and insulin, increasing its action.

However, an excessive concentration of oestrogens can expose a woman to a greater risk of developing certain forms of cancer, such as breast cancer, insulin resistance and infertility.

The oestrogen level changes according to body weight, therefore keeping weight under control influences the balance of the sexual hormones.

EXTRADIOL

Female sexual hormone, produced from testosterone. It intervenes above all in the woman's sexual development phase, but it also regulates other processes of the organism: it protects against osteoporosis and the cardiovascular risk.

SALIVA TEST

Saliva contains mucins, digestive enzymes, electrolytes, immunoglobulins and hormones. The hormones passively pass through the membrane of the saliva glands and reach the saliva only in a small percentage; the percentage corresponds to the "free" hormone, i.e. not linked to other proteins. This percentage corresponds to the active part of the hormones in circulation.

Unlike saliva, 95-99% of the hormones in the blood are linked to proteins, and they are not bio-available and therefore they are inactive. Many studies show that the concentrations of hormones in saliva corresponds to those found in blood serum. Furthermore, it is very simple to take a saliva sample, without any stress, and the sample remains stable for a long time.

USEFUL RECOMMENDATIONS

The process of slimming and of structuring a correct diet can be influenced and favoured by lifestyle: favouring foods with a lower glycaemic index, practising a certain type of physical activity, and following the body's natural circadian rhythms. For that matter, it is a good rule and certainly a good start for improving well-being, to avoid smoking, eating wrong foods and at irregular times, and a sedentary lifestyle.

REPEATING THE TEST

Repeating the test every 3-4 months is recommended. In the case of therapeutic monitoring, or disease, the test should be repeated according to the recommendations of the patient's doctor. In the case of difficulty in interpreting the result or in the case of diseases already in progress, the opinion of a specialist, who can give targeted therapeutic support, should be sought.

IMPORTANT

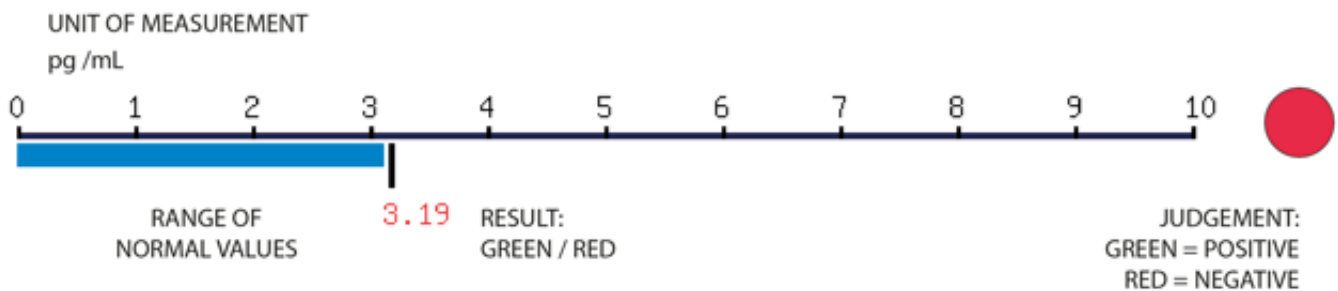
The results of the test must always and in any case be examined by the doctor considering the clinical situation of every single patient. This test cannot be reproduced partially.

The laboratory results, graphs and explanations contained in this dossier must not be considered as a medical diagnosis. It only represents an instrument available to the patient's own doctor, who can use it together with the findings of a medical examination or other diagnostic tests, to formulate a correct therapy and to diagnose the subject's state of well being.

TEST READING GUIDE

Key

- GREEN TRAFFIC LIGHT: the result is in the range of normal values
- RED TRAFFIC LIGHT: the result is outside the range of normal values
- RANGE OF NORMAL VALUES: indicated by the blue line



TEST RESULTS:

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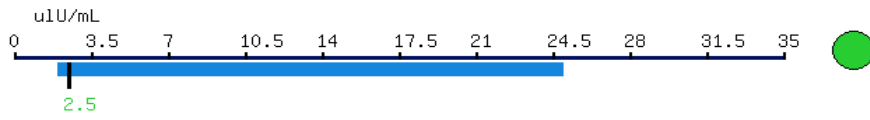
WEIGHT LOSS PROFILE **(Assessment of hormone balance)**

Dott.ssa Ausilia Rausa

A handwritten signature in black ink, appearing to read "ARausa", is positioned below the printed name.

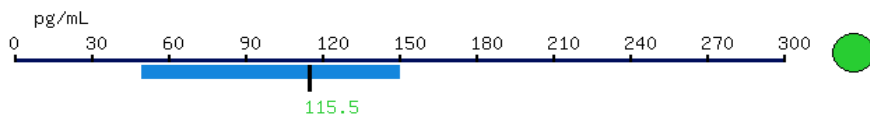
Results

Insulin



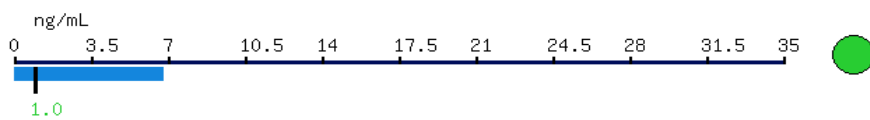
2.5 uIU/mL
(2 - 25)

Glucagon



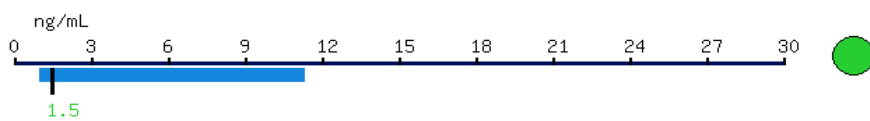
115.5 pg/mL
(50 - 150)

Growth hormone



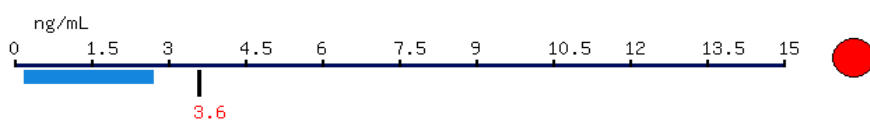
1.0 ng/mL
(0 - 6.8)

Morning Cortisol



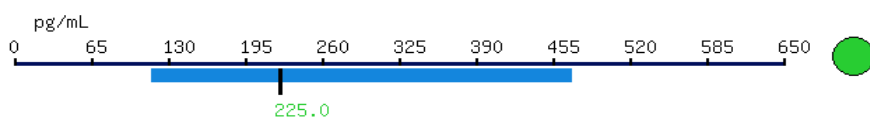
1.5 ng/mL
(1 - 11.3)

Evening Cortisol



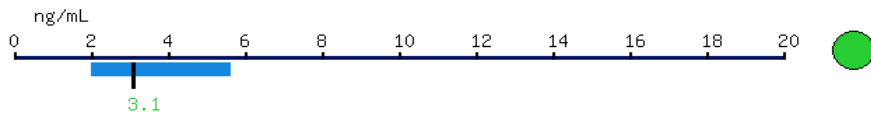
3.6 ng/mL
(0.2 - 2.7)

DHEA



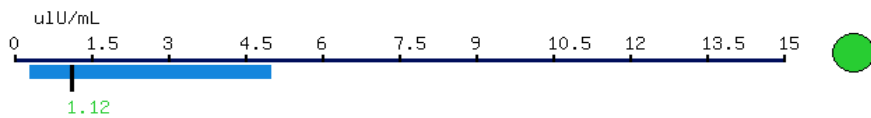
225.0 pg/mL
(116 - 471)

Leptin



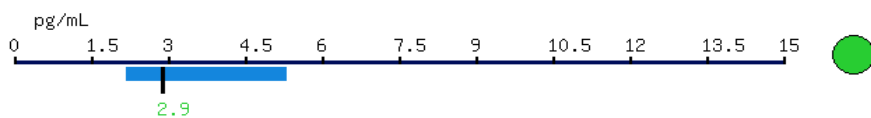
3.1 ng/mL
(2.0 - 5.6)

TSH



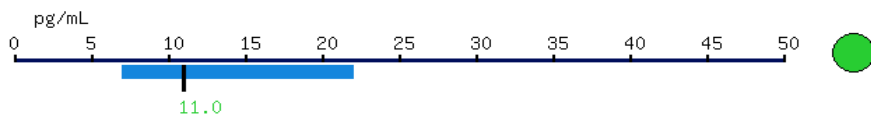
1.12 uIU/mL
(0.3 - 5)

FT3



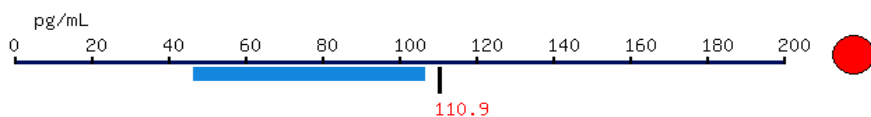
2.9 pg/mL
(2.2 - 5.3)

FT4



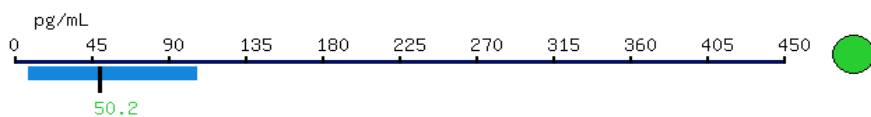
11.0 pg/mL
(7.0 - 22)

Testosterone



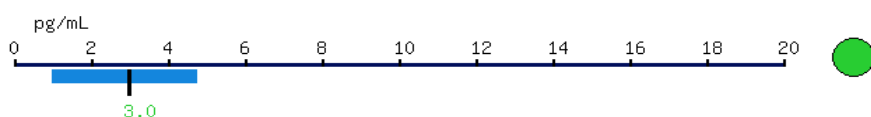
110.9 pg/mL
(46.8 - 106.8)

Progesterone



50.2 pg/mL
(8.6 - 107)

Extradiol



3.0 pg/mL
(1 - 4.75)