Study on Correlation between Posture and Sport

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***Abstract*—Posture is the position of our body in space; understood both as an attitude that the body assumes with respect to the supporting surface,both as an interrelationship between the various skeletal segments.In physiatrics, orthopedics, dentistry, ophthalmology, neurology, dietology etc. we are now talking about posture. In fact, posture studies, thanks to technological innovations, have made great strides in recent years.But what determines an individual's posture?The postural tonic system determines on the person's posture, complex neurophysiological and biomechanical mechanisms, where the various parts of the body are in relation to each other.Schematically we can say that a disharmonic posture causes dysfunctions of various disorders gravity, from back pain, headache, joint and muscle pain, as well as predisposition to trauma, injuries, muscular disorders (strains, cramps, etc .).The Posturologist performs a global functional clinical diagnostic assessment of equilibrium postural as a whole, evaluating with specific tests on the equilibrium (vestibular receptor), test on visual function (ocular receptor), tests to determine if there are occlusal interferences, coming from the masticatory system (teeth and jaw) that could condition the position of the spine, test to assess the position of the foot, test for evaluation musculoskeletal system, and other kinesiological tests. In addition, through computerized devices such as the "stabilometric platform", the exact podalic supports performing, examinations: baropodometric and stabilometric, both in position static that in dynamic trend.The posturologist determines an analytical and functional balance of the postural system and the individual receptors, evaluating the situation from a psychosomatic point of view, or trying to understand to what extent the psychological aspects come into play on the subject's posture.**

Often incorrect postures are identified that are specifically related to some emotional and character traits of the subject.

Keywords—posture; exercise, mobility; sport, core

PURPOSE OF STUDY: Looking for the best posture adapted to the sport, and how this is deeply involved in everyday life and especially in sports

INTRODUCTION: The correct posture can be defined synthetically as the "coherent deformation of gravity", in other words the correct posture is nothing but the most suitable position of our body in space to implement the antigravity functions with the least energy expenditure both in walking that in station; various factors (neurophysiological, biomechanical, emotional, psychological and relational) come into play.

Posture problems with a flat ground that offers a reduced number and little variable (in time and space) of return messages through our foot, as well as the use of high-heeled shoes that do not get information from the ground at the sole of the foot. Therefore, the worst combination is with the use of high shoes on flat ground; the best, however, with low shoes (barefoot limit) on uneven ground, such as walking barefoot on the shoreline or wearing flat shoes during a trek.

The concepts of spatiality, antigravity and balance that derive from this definition are important,also concept of spatiality is immediately following that of posture; in fact, the posture is nothing but the relationship of the body in the three axes of space.

As far as balance is concerned, it must be defined as the best relationship between the subject and the surrounding environment; it follows that the body, both in static and in dynamics, assumes an optimal balance according to the environmental stimuli it receives and the motor program it adopts.

An individual's posture is the result of the person's experience in the environment in which he lives, also determined by stress, physical and emotional trauma, repeated and persistent incorrect postures over time, incorrect breathing, biochemical imbalances derived from incorrect feeding, etc. .

From what has been said, it is clear that man's posture is in constant and progressive modification.

The factors listed above affect the muscular level resulting in an increase in the contraction status that is added to the pre-existing basal tone. This permanent state of excitation with the passage of time creates states of permanent muscle shortening, technically defined muscle retraction.

The muscle retraction is reversible only through fibrolysis techniques of the connective tissue that wraps the muscles and with applications of active global stretching.

The effects of a polluted posture and therefore of muscular retraction are manifested at the joint level in the form of compression, axial rotation and translation, determining changes in the skeletal structure (scoliosis, hyperlordosis, hyperkifosis, valgus and varus of the knees, etc.) and can evolve. in important

postural disorders up to real pathologies. Human posture is currently measured with various tools and in various ways. We recall baropodometric platforms, stabilometrics, photographic detection systems and various types of scanners. The Gait analysis allows you to see on a computer the pace of a person and study it. The ergonomic anthropometric biomechanical method (BAE) allows to measure the behavior of the body barycentre both in stationary and in walking and provides indices of ergonomic improvement (Tiziano Pacini Posture study and Baropodometric survey Chimat 2000, Postural System Ergonomics, Fabrica of the third millennium) Giuseppe Massara, Tiziano Pacini, Gioacchino Vella - Marrapese 2008)

RECENT FINDINGS:

Posture is the way to relate to the world, to stand up, to manage gravity at all times, to breathe, to do activities or to stay at rest: and if this happens in the most economical and profitable way for the body, we talk about functional posture.

As the name suggests, posture is a discipline that focuses its attention on the study of position, a topic of great scientific interest that has always attracted great interest among scholars.

It was the turn of the 1980 Da Cunha, famous for having conceived the "postural syndrome deficit", afterwards the scientists of the Japanese school brought great innovations especially in the field of diagnostics using new electronic means; finally, American scholars with completely different approaches and biomechanical techniques.

In this work my attention will be directed above all to the "French School of Posturology", certainly the most active in this field, and that in recent years with its President P.M. Gagey in collaboration with Prof. P. Villeneuve have meticulously studied every possible relationship between the stomatognathic apparatus and body posture.

HOMUNCULUS MOTORIO

It is the representation of the extension of the motor areas on the precentral gyrus of the telencephalon.

This representation is bilateral and crusade for the two cerebral hemispheres; it is to be considered that the adaptive capacity of these mechanoreceptors, which, as we will well remember from the studies on physiology, differ according to whether they are of children, with a high degree of adaptation, or adults, who generally have a discharge threshold less than 100 microns and therefore with a low degree of adaptation.

The most frequently used example to explain this adaptation is the inability that is frequently found in older men with a deep inhalation, in which case the mechanoreceptors of the intercostal muscles have a markedly low excitation threshold that will prevent normal stretching.

Therefore established that the mechanoreceptors, movement pressers, are the same as those present throughout the body, Posturology places at the center of its analysis the "Postural system" or better tries to place his patient in or out of this regulatory system by placing the degree and type of therapeutic treatment to be considered.

Considering a postural problem the possible loss of balance, we must remember Charles Bell who in 1837 first questioned how a man could maintain his posture against external stimuli; he answered himself a few years later giving the explanation in the presence of a "sense of balance" exclusively prepared for his maintenance.

Scholars of the same Romberg, Flaureus, Longet, in complete opposition to DeCyon and Magnis, who had not their own idea, went against the theory of the sense of equilibrium and began the era of research.

In 1890 Vierdort studied the balance thanks to the observation of Prussian soldiers during their exercises; but we had to get to 1953 to get the first stabilometric platform thanks to Ranquet, and to 1986 to see it correctly used by Gagey and Bizzo. PARAMORPHISM

Postural vices that often result from the psychological profile of the subject involved, somatizing a particular psychic dimension through the postural setting.

There are therefore no real morphological or structural alterations of the skeletal system and that any alteration of this nature can be reversed in the face of a possible useful but necessary evolution of the psychological habit of the individual.

These problems are particularly frequent in typically difficult and troubled age groups, as surely as puberty and adolescence.

In these subjects, the psychological and strong travail, sometimes exhausting, can be expressed in symbolic terms in the form of postural bodily attitudes that ultimately represent the attempt to communicate with the outside world, to express one's existential discomfort.

In this regard, physical exercise can do much, through an evolution of the postural somatic profile, of posture, thanks to an improvement of the general muscular tonicity and in particular of the tonic-postural component with psychological implications in terms of increased consideration of the his own person, of safety in facing the outside world through a definitely more positive and vigorous image.(as showed in Figure 1and 2)

SCOLIOTIC ATTITUDE

The kyphotic attitude, in decline, which makes the subject appear almost as if it were "hunchbacked" and certainly the result of a mental, psychological attitude of introversion, of rejection of the external world.

There is a closure due to various factors such as disorientation and fear of a world not yet well interpreted, in an age (adolescence) in which the doubts are many, misunderstandings with parents are often serious and lacerating, the first approaches with the other sex are still rather uncertain and they harbor feelings of uncertainty and incapacity.

From the physiognomic point of view the main characteristic and the increase of the curve of the dorsal part of the column which already represents a normal kyphosis, in these cases exasperated by an attitude of further flexion, without any vertebral structural alteration at the base .

Characteristically in the face of dorsal hypercifosis there is a compensation of the neighboring segments with lumbar hyperlordosis and cervical hyperlordosis, eventual anteriorized attitude of the head which is presented in extension with postrotation by translation of the atlanto-occipital hinge. We often find other relatively constant postural elements in these cases, namely the presence of flat, possibly asymmetrical feet, a class II cranio-mandibular framework with an open bite or a deep bite.

The shoulders are usually bent in intrarotation.

It is an attitude usually quite fixed in spite of the relative young age of the subjects and therefore it is difficult to treat this problem and to be able to see positive results in an acceptably short time.

Faced with a desirable and indispensable psychological maturation, exercise activities based mainly on movements in dorsal extension can be useful, reinforcing the dorsal tonic-postural paravertebral muscles, strengthening the pelvic girdle, increasing its stability at the expense of hyperlordosis, by working on the muscles abdominals, strengthen high extensor muscles such as the middle trapezius, shoulder muscles (rotator cuff, posterior deltoid).

An important feature is that of carefully monitoring the performance of the exercises as the subject typically tends to perform each movement adapting it to its own kyphotic attitude, which is therefore not at all opposed.

The scoliotic attitude consists in a deviation of the column on the posterior frontal plane, usually modest at the dorsal/lumbar level.

The activity that can be proposed to this subject absolutely excludes any exercise that involves loads on the column while non-heavy exercises on the paravertebral muscles are acceptable as extensions of the trunk performed very slowly and with moderate excursions.

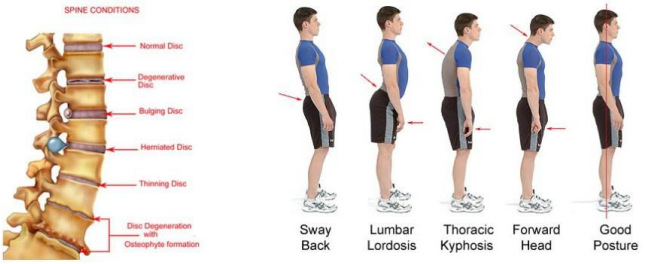

Figure 1. Paramorphisms due to prolonged compensatory phenomena of the rachis

DYSMORPHISMS

They represent real pathologies, sometimes even of serious entity, of strict orthopedicophysiological competence.

The aspect is much more important and drastically worsens the prognosis and the presence of structural-morphological changes in the vertebral components.

The possibility of regression of such alterations is almost nil even if an early diagnosis that leads to a consequent treatment can slow down its evolution until the completion of the skeletal growth, after which the ingrowth of the pathology slows down significantly until the definitive stabilization of the picture.

Physical activity in these issues takes on a role completely secondary to the prognosis, however, it is important to consider the utility takes exercise in terms of muscular trophism, tissues and health in general: this also means preventing complications, many times even serious, if not promptly prevented and treated .

The exercises are useful exercises aimed at improving the tropism and muscle tone of the pelvic-abdominal and paravertebral girdle.

In particular, it is important to try to maintain the maximum possible mobility between the vertebral bodies avoiding safe evolutions in the arthrosic-degenerative sense.

Absolutely to discard any exercise that involves loads to the column. The dysmorphisms are:

-Dorsal kyphosis, scoliosis

-Dysmetry of the lower limbs

-Dorsal kyphosis: determined by the decrease of the dorsal physiological kyphotic arch, usually irreversible. A cause can be a trauma to the dorsal column that has caused fracture with crushing of vertebral dorsal bodies with irreversible deformation and shortening of the dorsal curvature.

The limit between hypercifotic attitude and true kyphosis is not always so clear.

Scoliosis: latero-deviation of sections of the spine on the frontal plane with rotation of the vertebral bodies. It usually appears at a young age and more precociously occurs more aggressive results.

Elective treatment is orthopedic or surgical.

Movement and physical activity, monitored and personalized, must aim above all to preserve the mobility of the various body segments and to avoid weight gain due to issues of deicaric distribution and of the center of gravity at the expense of the column.

Lower limb dysmeter: frequently there are differences of a few millimeters between the two limbs, this can be considered paraphysiological and the compensatory adaptation mechanisms of the postural system are sufficient.If the magnitude of this difference in limb length is greater, there is a certain compensatory balancing of the pelvis and this may mean a corresponding compensation curve of the vertebral column (scoliosis). In this case, the picture presents elements of pathogenetic achievement and therefore scoliosis can be predicted and therefore prevented, by means of appropriate compensatory orthopedic interventions of the true limb dismetry.

The verification of the dysmetry is performed by measuring the length of the limbs with the subject lying supine by calculating the distance between the anterior superior iliac spine (SIAS) and the tibial malleolus.

The particularity that may be of interest to the Preparator is that these subjects usually present muscular hypertrophy of the quadriceps of the longest limb, due to the greater load of the limb which is more likely to relieve the ipsilateral hemibacine.

Therefore a work of improvement of the conditions of the relatively hypotrophic limb is necessary in order to avoid possible traumas induced by this asymmetry of muscular force.

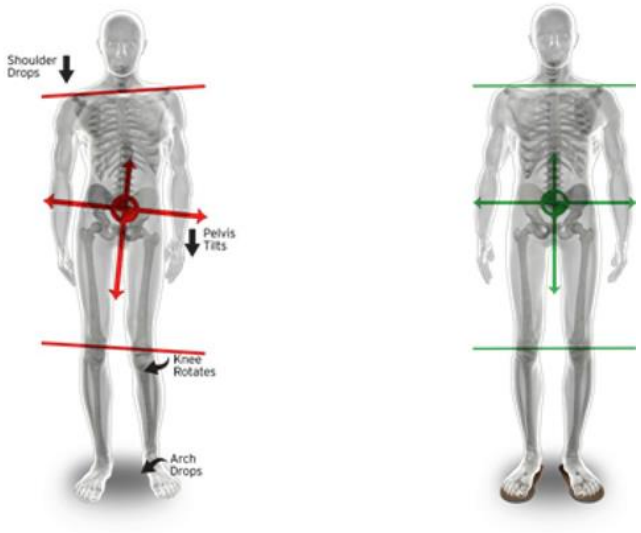

Figure 2. Postural imbalance representation

CONCLUSION: As we have seen, posture in sport helps from every point of view, even emotional, from this we must learn how fundamental a very solid structure with a musculature that does not hold weaknesses or serious retractions and we have also seen how the sport activities help in this, maintaining a stability and mobility of the "CORE" of the whole body, it is very important, therefore, to set up a rehabilitative / preventive type of work to avoid that any imbalances take the upper hand, the sport definitely comes to the first place.

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