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ANALYSIS AND SOMATOSCOPIC INTERPRETATION OF THE SPINAL COLUMN

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Abstract. *The current situation with regard to the timely detection and diagnosis of functional spinal impairments of the spinal column in prepubertal children is in a poor state due to the methods of investigation and interpretation of the results obtained by various applied methods of assessment when the postural conflict is already structured.*
Keywords: *somatoscopy, spinal column, functional physical deficiencies, analysis and interpretation.*

Introduction. The prepubertal period when the growth processes are faster in the bone apparatus, increasing in length and less in thickness, so the height is the one who is highlighted, and the supporting muscles is weak, the mal-alignment of the locomotor apparatus structures increases. The structure of the bone system at this age is in formation, the bones are long and thin, insufficient muscle development, the joints are in a high ligament laxity which favours the lack of stability and implicitly the appearance of the functional physical deficiencies, of the vicious posture attitude, that once installed have an evolutionary trend and are difficult to stabilize or correct. In addition to these structural and functional discrepancies, there are sometimes imbalances between the segments or even the organs, long and thin arms, domed or flat thorax, this is accompanied by functional or psychological disturbances. [1] Muscular hypotonia can be considered a pathogen factor of static and dynamic disorders of the locomotor system, this hypotony generates articular laxity and negatively influences the ability of voluntary control and reflex control of skeletal muscles. [8] The worst segmental deficiencies, the most important in terms of the consequences and complications that can be reached are those of the spinal column. (kiphosis, lordosis, scoliosis and their combinations).[2]

Cordun M, 1999, calls functional deficiencies deviations, postures or deficient attitudes as representing disorders of the body's support and movement functions, always attracting muscle imbalances that will hurt the movements functioning. If these deficiencies are not detected in time, they will turn into structural deficiencies that will cause degenerative degradation, which is functionally or even organically fixed, turning into deformations [4]

The aim of the research is to study the aspects related to the installation of postural deficits of the spinal column in prepubertal children at the time of vicious postural attitude.

The research objectives were to analyse the methodical-scientific literature regarding the prevention of vicious attitudes of the spinal column; the somatoscopic assessment of prepubertal children; establishing a method of investigating and storing information obtained in a form that allows mathematical analysis.

Methods of research: analysis of specialized literature; somatoscopic method; photographic method; graphic method.

The somatoscopic and anthropometric evaluation in order to monitor the growth and physical development process in prepubertal children with the aim of preventing the occurrence of functional physical deficiencies of spinal column complements the clinical picture and defines the establishment of the functional outstanding in the researches. [6]

The position in which the assessment is carried out is: with the relaxed shoulders, the upper limbs along the body, the palms in the intermediate prone position, the fingers slightly bent, the horizontal chin, the anterior look, the close

heels, the fingertips spread at about 450. [3] In the experiment for the selection of the children proposed to perform the experimental program, somatoscopic survey files were elaborated and implemented, to identify any physical attitudes or functional physical deficiencies of the body posture and especially of the spinal column.

In order to do this, a set of charts of the human body, the front, the back and the profile were developed, in which the anthropometric points and reference marks used in the evaluation process were highlighted. Fig. 1, 2, 3.

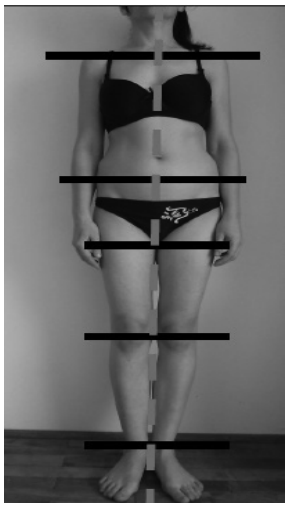

Fig.1
Front somatoscopic analysis

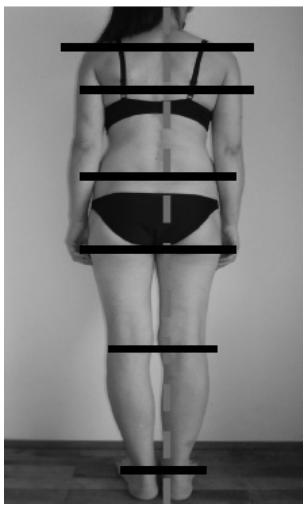

Fig.2
back somatoscopic analysis

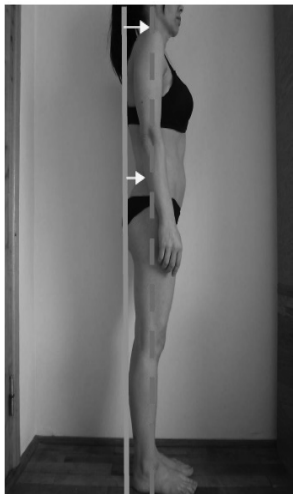

Fig.3
profile somatoscopic analysis

Front body alignment relative to vertical of axis 0.0

It is verified by: middle of forehead, menton, sternum, umbilicus, pubic symphysis, internal femoral knee, internal tibial malleolus and is projected into the middle of the support base. The following lines (numbered from top to bottom) are reported on this axis: 1-*biacromial* line; bimamelonar in men, 2 - *bicrete*; 3 - *bitrohanterian;* 4 biepicondiliar-femoral; 5 – bimamelonar. Figure 1. Regarding the notification system, we will use: biacromial , bicrete, bitrohanterian, biepicondiliar-femoral, bimamelonar lines will be marked with "P", namely parallel to the other marks or nonparallel "NP", triangles formed by arms and body, with S "symmetrical and"A" asymmetrical ", knee" AN "normal alignment or the deficiency noted" G valg "or" G var".

Back body alignment relative to axis 0.0

It is verified by: vertex, external occipital protuberance, spinous apophyses of the cervical, thoracic, lumbar vertebrae, buttock fold, between internal femoral epicondyles, internal tibial malleolus and projected into the middle of the support base. A set of horizontal lines is referenced to this vertical: 1 - *the biacromial line,* (the acromial extremities); 2 - *the tops of the shoulder blades*; 3 - *the bicrete line,* (iliac crests); 4- *bitrohanterian* (large trochanters); 5 - the knee *femoral medial epicondyles line*; 6-*bimamelonar* (tibial malleolus): Figure 2.

Referring to " Somatoscopic survey file of the body (relative to axis 0.0), its completion shall be as follows: biacromial, bispinal, bicrete, bitrohanterian, biepicondiliar-femoral, bimamelonar lines shall be marked with" P "namely parallel to the other markers or "NP " nonparallel, triangles with " S " symmetrical and " A" asymmetric " in knee" AN " the normal alignment or deficiency noted " G valg "or" G var ".

Alignment of the body in profile with the vertical axis 0.0: occurs when the vertical axis 0.0 co-

incides with the axis of the symmetry of the body, which passes through: vertex, ear lobe, acromion, femur large trochanter, slightly anterior to the median of the knee, slightly ahead of the median line of the tibial malleole, Figure 3. For optimization we will also call for the alignment of the body in the profile where the body is against the wall (we can use the lead thread), in this position we make measurements of the distance between the occiput and the wall; the lumbar region and the wall (if these values are not approximately equal we have a malignant alignment in the sagittal plane, kyphosis, lordosis, cifo-lordosis) [3,7].

The way of measurement and interpretation:

- Position of the head in relation to the trunk: "NA" normal alignment, or we will note, anteduction, retribution, flexion, extension, rectitude;

- The position of the basin relative to the trunk: "NA" normal alignment, or retranslation, anteducation;

- Cervical and lumbar artery: measured in centimetres with the graduated line between the cervical column occiput and a fixed mark, either the wall or the lead, and the lumbar spine and the index used;

- Knee position: "NA" normal alignment, or knee in extension or flexion;

- The overall attitude of the back: "NA" normal alignment, or attitude, lordotic cifotic, cifo-lordotic, rectitude;

- For observations: Specify particular situations that were not included in the file and help create a complete postural diagnosis

We will present a model of a somatoscopic observation file:

Somatoscopic observation of the body in the frontal plane viewed from the front (reported to the axis 0.0)

nr.	Name	gender	age	shoulder line biacromi-al	the line joining the shoulder blades	the line SIPS	the line bitro-han-te-rian	the line bimaleo-lar	the triangles between the upper limbs and the trunk	Tri-an-gles of shoul-der blades	lower limb position genuvar/ valg	Vicious postural tendency
1	BC	F	13	P	P	P	P	P	A	S	AN	Scoliosis 2
2	BL	F	11	P	P	P	P	P	S	S	Gvar	2
3	BA	F	12	P	P	NP	NP	P	S	S	AN	Scoliosis 2
4	BM	F	12	NP	P	P	P	P	A	S	AN	Scoliosis 3
5	BR	F	11	P	P	P	P	P	S	S	AN	0
6	CT	F	13	P	P	P	P	P	S	S	Gvar	2
7	FA	F	11	NP	P	P	P	P	A	S	AN	Scoliosis 3
8	GA	F	13	P	P	P	P	P	S	S	AN	0
9	GR	F	12	P	P	P	P	P	S	S	AN	0
10	MD	F	13	NP	P	NP	P	P	A	A	AN	Scoliosis 4
11	M	F	11	NP	P	P	NP	P	A	A	AN	Scoliosis 4
12	PV	F	12	P	P	P	P	P	S	S	AN	0
13	PA	F	12	P	P	P	P	P	A	S	AN	Scoliosis 2
14	SI	F	13	P	P	P	P	P	S	S	AN	0
15	SD	F	12	P	P	P	P	P	S	S	AN	0

the legend P = parallel to the ground line S= symmetrical triangles AN= normal alignment Gvar= genuvarum

NP= not parallel to the ground line A= asymmetrical triangles Gvar= genuvarum

In the present case, somatoscopic observations were made using the F1, F2 and F3 observation files, a number of 60 copies of which 30 represent the control and 30 experiment groups. The way of using these observation sheets will explain how to interpret and centralize the data obtained by the observation method, namely the somatoscopic method. In order to be able to perform a method of transforming the images obtained in quantifiable data (digits), an interpretation system based on the following characteristics was developed. In principle, body observation is done on the subject in front, back and profile, he must adopt a relaxed position with his hands near the body.

Table 1 shows the values of the results obtained by the experimental and control group at the initial assessment of the somatoscopic analysis by

applying F1, F2 and F3 files.

C1 - C5 represents the coefficient of the degree of risk, it is observed that C1 and C5 have no values in the table, being considered extreme, for C2, C3 we have the most values, considering that this is the position in which one can identify the fastest Possible deviation from positive postural status. C4 is a higher degree of risk and requires special attention.

Achieving the "C" degree of risk is achieved by gathering the negative points observed in the somatoscopic observation records (N = nonparallel, A = asymmetric, retrieval, etc.) at one, two negative markers fall into C2; at two, three - C 3; at three, four in C4 and the next coefficient, C5 already signals a conflict situation with structured posture mal-alignments.

Table no. 1 Centralizer with the tendency to install vicious postural attitudes in children who were included in the initial assessment experiment (n = 60)

TABLE WITH INSTALLATION TENDENCIES OF VICIOUS POSTURAL ATTITUDES in the initial somatoscopic assessment													
CONTROL GROUP							EXPERIMENT GROUP						
The degree of risk	Kyphosis attitude trends		Lordotic attitude trends		Scoliosis attitude trends		Kyphosis attitude trends		Lordotic attitude trends		Scoliosis attitude trends		Total
	G	B	G	B	G	B	G	B	G	B	G	B	
C1	0	0	0	0	0	0	0	0	0	0	0	0	B = 0 G = 0
C2	1	3	1	3	3	1	3	1	0	2	3	4	B =14 G =11
C3	3	1	1	0	2	2	1	2	2	1	2	1	B = 7 G =11
C4	1	1	0	0	2	2	0	1	0	0	1	0	B = 4 G = 4
C5	0	0	0	0	0	0	0	0	0	0	0	0	B = 0 G = 0
Total	5	5	2	3	7	5	4	4	2	3	6	5	G = 23 B =26

According to the results of Centralizer Table 1 and the graphical representation in Figure 4, the following conclusions can be drawn, namely that 49 children from the 60 who were subjected to the somatoscopic observation and evaluated based on the postural analysis system presented above, shows tendencies to install postural vicious attitudes with a varied risk rating as follows: C2, 14 boys and 11 girls, C3, 7 boys and 11 girls, and for C4, there are 4 boys and 4 girls.

The scoliosis tendency is the one with a higher score between 5 and 7 cases per group, then with 4 and 5 cases per group, followed by lordosis tendencies with 2 and 3 cases.

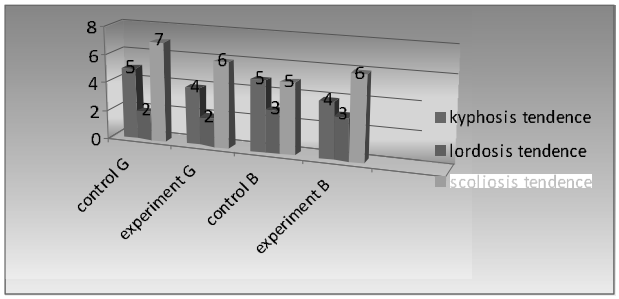

Fig.4 Graphic representation of subjects subjected to somatoscopic analysis at baseline assessment

Results and conclusions:

According to the elaborated observation sheets, centralizers were developed in an innovative interpretation way, allowing the postural aspects to be highlighted at an initial stage that

would allow the prognosis of the future postural alignment and the prevention of the installation of vicious postural attitudes.

In the context of the elaborated somatoscopic records, the attempt was made to establish the postural situation at the initial stage and after the implementation of some means of education, especially from the swimming, in order to see whether these means influence or not the body posture of pre-pubertal children.

These results should not only be viewed from a mathematical point of view, because the differences that result from the initial and the final testing of the postural analysis conducted by the experimental group are not distinct. It should be noted that a tendency of a vicious postural attitude once installed tends to evolve, to turn into a vicious postural attitude, and then to become a physical deficiency that can not be managed anymore by methods specific to orthopedics, surgery or, in the most happy cases, kinetotherapy.

Based on this scientific study, the mechanism presented above has been applied, which has been transposed into a measurable measuring instrument, ensuring a higher degree of objectivity. This mechanism has created the ability to measure and evaluate body posture in pre-pubertal children to monitor their growth and development process.

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