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Review Article

Biomechanical Aetiology of the So-Called Idiopathic Scoliosis - Described in Lublin, Poland in 1995 - 2007. New Classification. New Therapy. Causal Prophylaxis

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Abstract

The discovery of aetiology of the So-Called Idiopathic Scoliosis was in 1984/1995 - 2007 (T. Karski). The spinal curvature deformity is connected with biomechanical influences - a/ the permanent habit of standing 'at ease' on the right leg in two groups and types and with b/ specific patterns of walking, also in two groups and types in the new Lublin classification. In basic findings in aetiology is: *asymmetry of movement of hips - limited adduction in extension position of right hip. This symptom is one of seven in Syndrome of Contracture and Deformities according Prof. Hans Mau from Germany (in German Siebenersyndrom). First my (T. Karski) lecture about biomechanical aetiology of scoliosis - on the Internet called Adolescent Idiopathic Scoliosis (AIS) - was in Szeged in 1995 during the Orthopaedic Congress. First publication was in 1996 in Orthopädische Praxis in Germany [8]. In this publication is presented new classification, new therapy and rules of causal prophylaxis.

***Keywords**: So-Called Idiopathic Scoliosis; Classification; Therapy; Causal Prophylaxis*

History of discovering the aetiology of scoliosis [1-68]

Discovery of the aetiology of "Idiopathic Scoliosis" - or described in Internet as "Adolescent Idiopathic Scoliosis" (AIS) - was between 1984/1995 and 2007 in Lublin, Poland - fully confirmed in observations till 2026 [8-56,68]. First my observation about "scoliosis" was in Invalid Foundation Hospital in Helsinki, Finland in 1984 during my education stay.

Hippocrates (460 - 377 BCE) was the first who treated spine deformity in the form of "scoliosis". Claudius Galenus (129 - 216 CE) introduced to medicine the words kyphosis, lordosis, scoliosis. In the next centuries, about scoliosis was written by Nicolas Andry - creator of the word "orthopaedics" and the part of medicine (1741, Paris, France). The word "orthopaedics" comes from the Greek language - "orthos" - correct and "pais" - child. About scoliosis had written many orthopaedic specialists like Prof. Konrad Biesalski, who created the first Orthopaedic Hospital in Central Europe (Oskar-Helene-Heim in 1905/1914 in Berlin, Germany), Prof. Ireneusz Wierzejewski, who created the Orthopaedic University Department in 1921 in Poznan (Poland). Here - I would like to inform - in Poznan in 1913, the Orthopaedic Hospital was created by Lord Gąsiorowski for the therapy of his own daughters ill with poliomyelitis acuta. Very important was the research of Dr. Joseph C. Risser, who in 1958 (USA) published the article "The Iliac Apophysis: An Invaluable Sign in the Management of Scoliosis" - important for assessing the progression of scoliosis during the growth period of children's lives. Significant research came from Prof. Hans Mau (1921 - 2012, Tübingen, Germany) who described the "Siebenersyndrom" (English: "Syndrome of

Seven Contractures/Shortenings and "asymmetrical position of parts of the child's body".

Over the centuries, the aetiology of scoliosis was a secret - it was neither found nor described. Therapy - muscle-strengthening exercises - were also ineffective - and were not performed only - my personal observations - in two countries: Hungary - in Szeged and in Denmark - in Copenhagen. To explain - wrong results of therapy - doctors have to say to parents and children "it is the natural history of scoliosis" - no - my explanation - it was the result of wrong therapy.

All details about the biomechanical aetiology of the idiopathic scoliosis were described between 1984/1995 - 2007 in Lublin, Poland (T. Karski). A new classification with three (3) groups and four (4) types of scoliosis were also described, the proper therapy and the principles of causal prophylaxis were presented. From this time, I do not use the term "Idiopathic Scoliosis" but "So-Called Idiopathic Scoliosis".

Explanation of causes of the aetiology of the so-called idiopathic scoliosis and presentation of new classification [A] [B] [C] (Figure 1 and 2) [8-56,68]

[A] There is an asymmetry of hip movements - one of the 7 symptoms of the Syndrome of Contractures and Deformities (SofCD) - according to Prof. Hans Mau from Tübingen, Germany (in the original description, Siebenersyndrom). It is limited movement of the right hip - specifically adduction in extension position - and often internal rotation. Both these factors change the function of standing and walking.

[B] Scoliosis develops because of the habit of standing only on the right leg - because of shortening of fascia lata (FL) and tractus ilio-tibialis (TIT) and other soft tissues on the lateral side of the right hip and femur. It is connected with the "left sided position of foetus" in the mother uterus - 90% - 95% of cases - knowledge of polish and abroad gynaecologists -what next explained and confirmed the observation of Prof. Hans Mau about Siebenersyndrom. So - in many children this syndrome of contractures and deformities explain shortening of FL and TIT which is the cause of standing on the right leg. Such standing on the right leg is stable, comfortable, not tiring - observed just at children in the age of 2 - 3 years - but permanent and because of this - pathological.

For this group of persons, a statistical observation of students in the Medical University in Lublin - in October - December 2025, January - March 2026 was performed. It was stated that 70% of students - boys and girls - have the habit of standing 'at ease' for a long time or permanently on the right leg.

[C] Classification - Three (3) groups and four (4) types of scoliosis (Lublin 2001 - 2004) (Figure 1-5)

- **1st group and type:** "S" scoliosis. 3D. Two curves - lumbar left convex, thoracic right convex. Gibbous on the right side of thorax. Stiff spine. Causes - standing 'at ease' on the right leg and walking. Walking - why? - in a situation of absent movement of the right hip - it is compensatory movement of the pelvis and spine - but has the character of "distortion movement" - in result - scoliosis. Confirmation on "computer created gait analysis".
- **2nd/A group and type:** "C" scoliosis. 2D. Lumbar left convex scoliosis. Causes - standing 'at ease' on the right leg. Theoretically 70% of people in the world can have scoliosis - but it is connected with the time of such standing. If is 80% of time standing on the right leg - big scoliosis, 70% - 60% small scoliosis, 50% no scoliosis.
- **2nd/B group and type:** "S" scoliosis. 2D or 3D. Lumbar left convex, thoracic right convex scoliosis. Spine flexible. Causes - standing 'at ease' on the right leg - plus laxity of joints and/or wrong/incorrect previous therapy.
- **3rd group and type:** "I" scoliosis. 2D or 3D. Stiff spine. No curves or small. Causes - walking only. About this group of scoliosis - was in 2004 my (T. Karski) discussion with Prof. Keith Luk and Prof. Kenneth Cheung in Hong Kong.

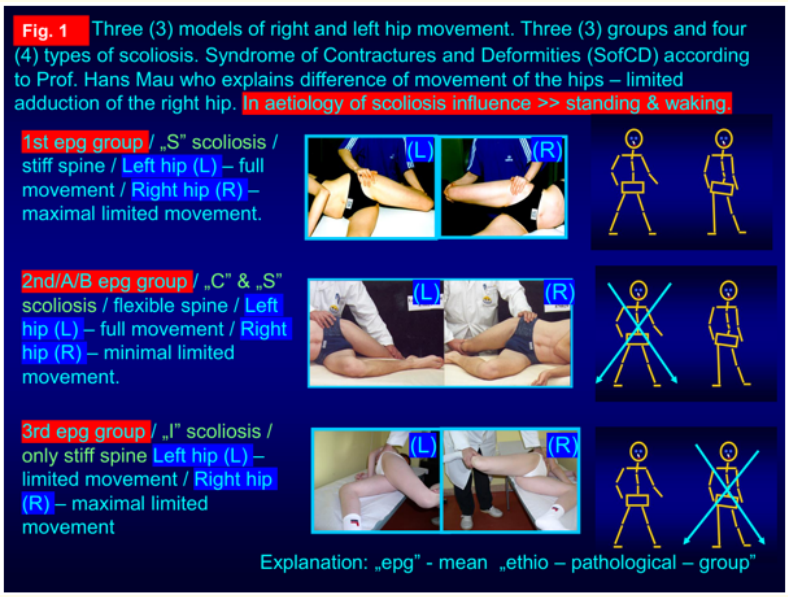

Figure 1: Three (3) models of right and left hip movement (Add./IR) Three (3) groups and four (4) types of scoliosis. Syndrome of Contractures and Deformities (SofCD) according Prof. Hans Mau explains the difference of movement of hips - limited adduction of the right hip. In aetiology of scoliosis influence >> standing and walking.

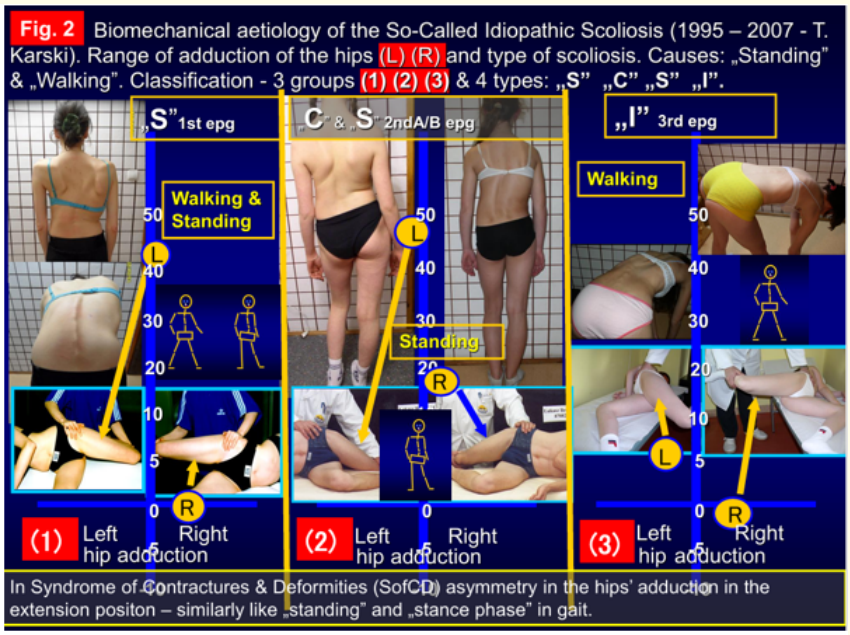

Figure 2: *Biomechanical aetiology of the So-Called Idiopathic Scoliosis (1995 - 2007 - T. Karski). Range of adduction of the hips (L) (R) and type of scoliosis. Causes: "Standing" and "Walking". Classification - 3 groups (1) (2) (3) and 4 types: "S", "C", "S", "I". 2 In Syndrome of Contractures and Deformities (SofCD) asymmetry in hips' adduction in extension position - similarly like "standing" and "stance phase" in gait.*

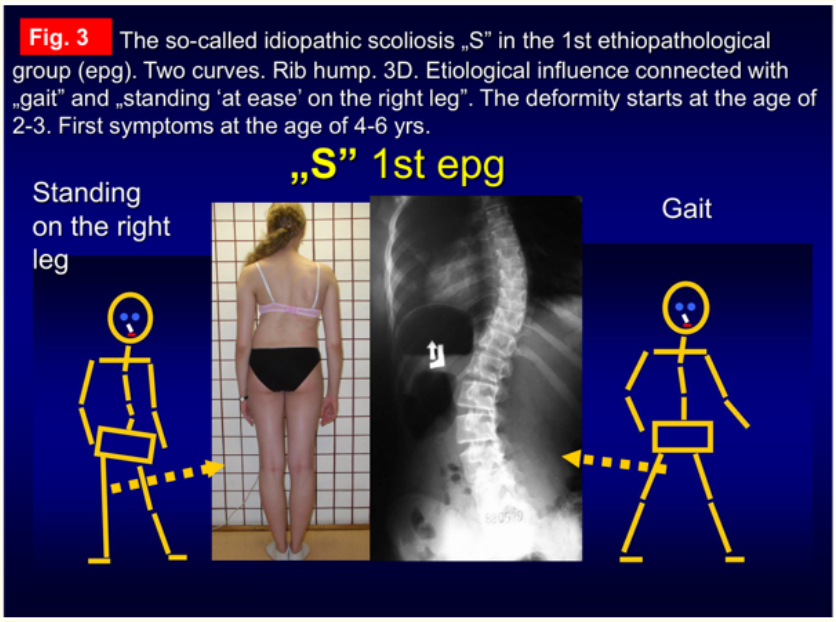

Figure 3: *The so-called idiopathic scoliosis "S" in 1st etiopathological group (epg). Two curves. Rib hump. 3D. Etiological influence connected with "gait" and "standing 'at ease' on the right leg". The deformity starts at the age of 2. First symptoms at the age of 4 - 6 yrs.*

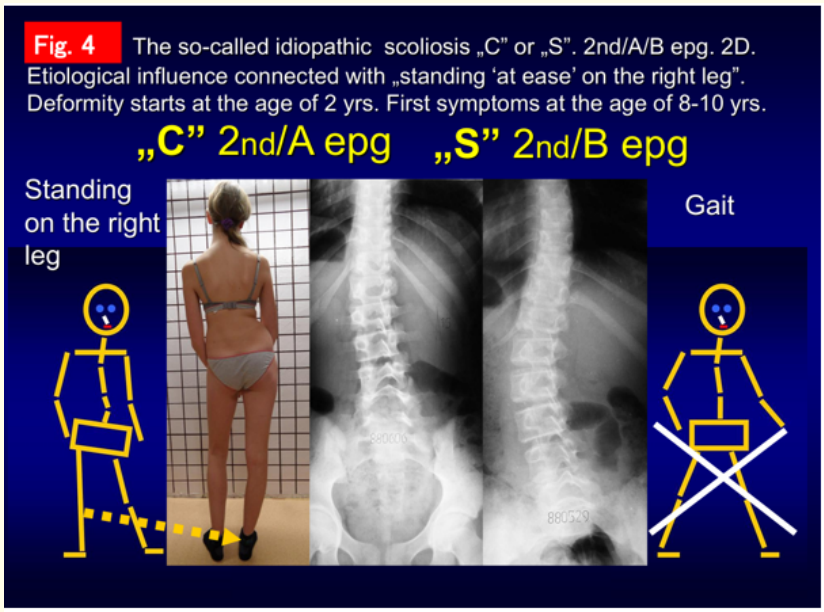

Figure 4: *The so-called idiopathic scoliosis "C" or "S". 2nd/A/B epg. 2D. Etiological influence connected with "standing 'at ease' on the right leg". The deformity starts at the age of 2 yrs. First symptoms at the age of 8-10 yrs.*

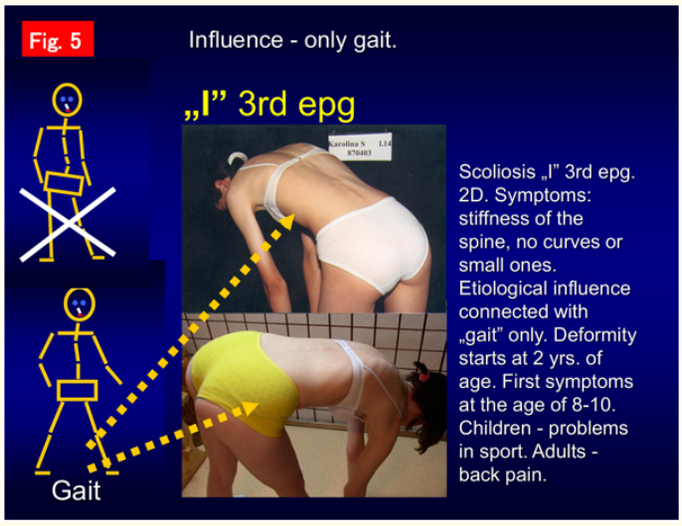

Figure 5: *Scoliosis "I" 3rd epg. 2D. Symptoms: stiffness of the spine, no curves or small ones. Etiological influence connected with "gait" only. The deformity starts at 2 yrs. of child's age. First symptoms at the age of 8-10. Children - problems in sport. Adults - back pain.*

Scoliosis. Therapy (Figure 6-10)

Firstly, I want to say definitely - all "muscles strengthened exercises" were and are fully incorrect (see - not performed in Szeged, in Copenhagen). Only new therapy - stretching exercises - to receive full range of movement in the hips - especially adduction of the right hip in its extension position, full range of movement in the spine in all directions - is proper and gives good results. So - proper therapy - flexion exercises to the front, the left, and the right sides of the body. Here my obligation is to inform - first such exercises had to use for therapy of scoliosis Prof. Stefan Malawski in Warsaw, Poland in the years 1950 - 1970. Thanks to such exercises, there is no shortening of soft tissues - muscles, fascia, capsules - especially in concave side of scoliosis - and the growth of the spine is proper - symmetrical - preventing scoliosis. Very beneficial are sports activities such as karate, taekwondo, aikido, kung fu. Very important is prophylactic or therapeutic standing 'at ease' only on the left leg. In our recommendation it is the first point of proper therapy and prophylaxis.

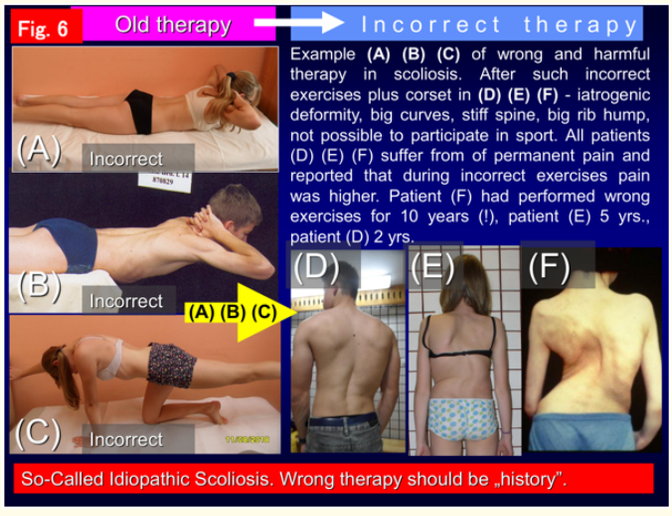

Figure 6: *Example (A) (B) (C) of wrong and harmful therapy in scoliosis. After such incorrect exercises plus corset in (D) (E) (F) - iatrogenic deformity, big curves, stiff spine, big rib hump, not possible to participate in sport. All patients (D) (E) (F) suffer from permanent pain and reported that during incorrect exercises pain was bigger. Patient (F) had performed wrong exercises for 10 years (!), patient (E) 5 yrs., patient (D) 2 yrs.*

Figure 7: *Patient 64 years old. In childhood 5 years improper therapy by wrong exercises. Many years corset. Two operations in two Orthopaedic Departments in Kxyz (1984) and in Zxyz (1989). Huge iatrogenic deformity. Stiffness of spine. Maximal hump. Chronic spine pain. Unable to have a normal life and work. Consultation and photos in Lublin on 4th February 2019.*

Figure 8: *Example of proper therapy of scoliosis in Sanatorium for Children of the name of Dr Janusz Korczak in Krasnobród, Poland. Cooperation with our Department from 1977 till 2019. In a program of therapy of scoliosis stretching exercises - to receive full range of movement of hips, position of pelvis and full movement of spine. Standing 'at ease' only on the left leg in everyday situations.*

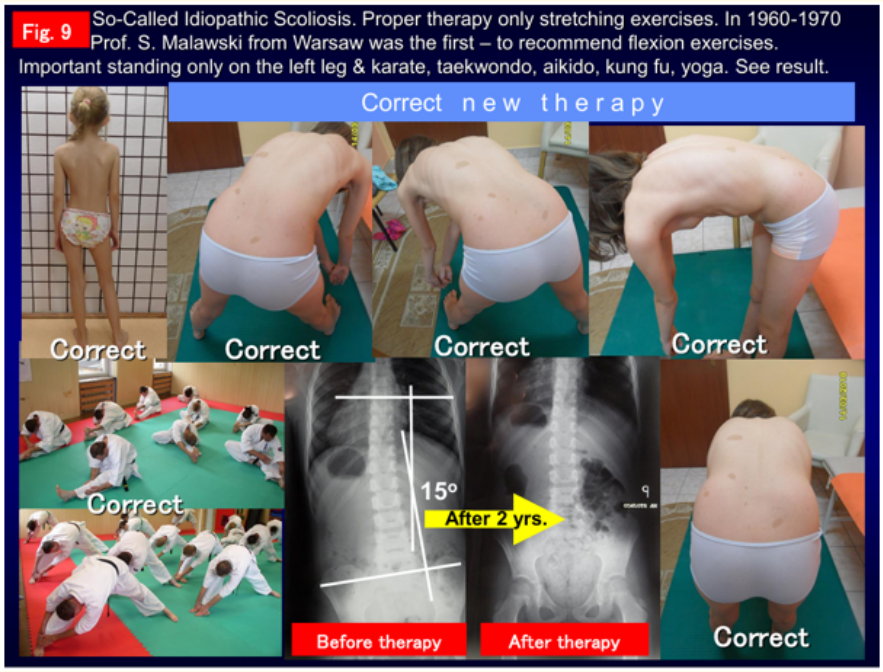

Figure 9: *So-called idiopathic scoliosis. Proper therapy only stretching exercises. In 1960-1970 Prof. S. Malawski from Warsaw was the first - recommended flexion exercises. Important standing only on the left leg and karate, taekwondo, aikido, kung fu, yoga. See result.*

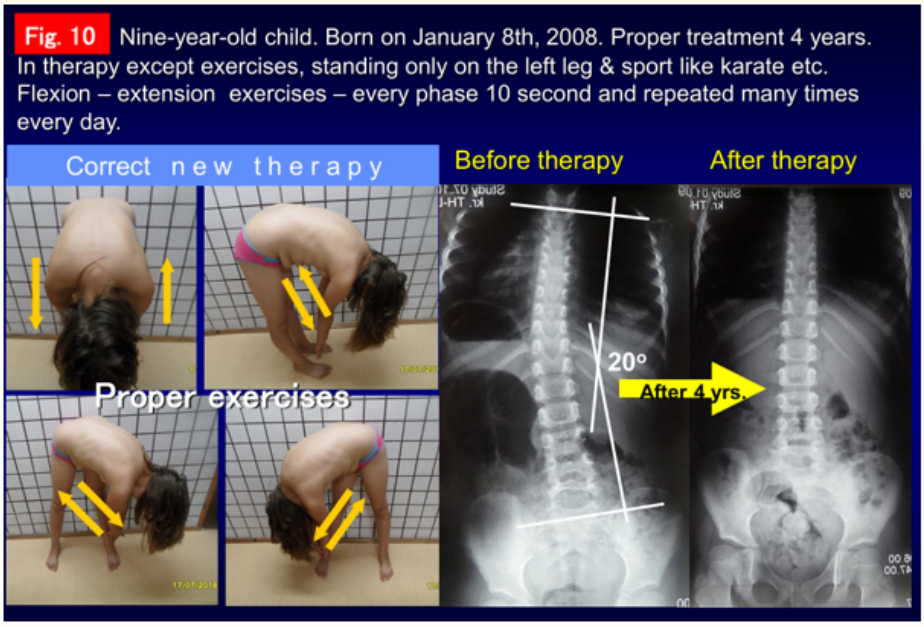

Figure 10: *Nine-year-old child. Born on 08.01.2008. Proper treatment for 4 years. In the therapy except exercises, standing only on the left leg and sport, karate etc. Flexion - extension exercises - every phase 10 seconds and repeated many times every day.*

Scoliosis. Causal prophylaxis (Figure 8-10)

Causal prophylaxis of scoliosis is possible, and we present the principles in points:

(A) Standing on the left leg as prophylaxis or therapy. Such prophylaxis should be introduced when children are between 3 and 5 years old.

(B) Stretching exercises - to achieve full movement of the right hip and full movement of the spine in all directions - flexions to the front, to the left, and the right side.

(C) Very beneficial for prophylaxis are sports such as - karate, taekwondo, aikido, tai chi, yoga. Such activities should be introduced in all Primary Schools worldwide.

Discussion

During many congresses and symposia from 1995 till 2026 - SICOT, SOSORT, IRSSD, EPOS (See literature) I have presented the aetiology of the so-called idiopathic scoliosis, new classification, new therapy and I expect that presented therapy and causal prophylaxis will be introduced in all countries on the world. But - introducing of the new concepts and "new thinking" have "in problem of scoliosis" obstacle/hindrance - but I am full of "hope" that after publication in USA come the time of "new, proper view to scoliosis problems" and the "scoliosis deformity" will be only history. Important in therapy is a/ symmetry of movement of hips - left - right side, b/ symmetry of time - standing left - right leg, c/ symmetry of function of sides of the body - left - right - during walking. Here - in discussion - I would like to inform that permanent standing on the right leg - make also problem of right hips and right knee - see many my articles - published mostly in USA (See literature). Important message - one of the cause of right hip arthrosis is standing on the right leg. Smaller influence is to the right foot - but here - I inform - that for foot very dangerous is rotation movement in the ankle joint - see my publication in the list of literature. In my articles also described - influence of changes in Minimal Brain Dysfunction (MBD) on the locomotor system [17,19,21,22-24,29,39,40-44,47,50-54,68].

Conclusion

1. The ethology of the so-called idiopathic scoliosis is strict "biomechanical" - connected with "asymmetrical function in time and in sides of the body" - of time during "standing" and of sides left/right of the body during "walking".
2. Permanent standing 'at ease' on the right leg is connected with better stabilization of the right hip - and this is connected with changes of hip's movement in syndrome of contractures and deformities (SofCD) according of Prof. Hans Mau.
3. Smaller adduction in extension position of the right hip in SofCD enables easy and stable standing on the right leg - and in some cases has influence also on walking - the cause of rotation deformity of spine.
4. Such asymmetrical standing - more on the right leg - and also influence going from the walking start to be in the first years of a child's life. So - scoliosis starts to develop - just in small children - but the first symptoms are visible at the age of 7 - 10 years.
5. In the new Lublin classification there are 3 groups and 4 types of scoliosis - described in 2001 - 2004.
6. Important is causal prophylaxis of scoliosis and proper therapy. Rules: regaining movement of the right hip and flexion exercises of the spine in all directions. So - proper stretching exercises - not strengthening exercises.
7. Important - standing 'at ease' only on the left leg - children at the age 2 - 5 - and next all years. Remember - standing on the right leg - children - make scoliosis, adults - give spondylarthrosis and pain.
8. Encourage children to take-up sports forms like - karate, taekwondo, aikido, kung fu, tai chi - because in this sport there are elements of stretching - leading to symmetry of function.

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