

# Biomechanical Etiology of the So-Called Idiopathic Scoliosis, Connection with “Syndrome of Contractures and Deformities”, Role of Gait and Standing ‘At Ease’ On the Right Leg in the Development of Spine Deformity, New Treatment, Causal Prophylactics

Tomasz Karski

Vincent Pol University, Lublin, Poland

## \*Corresponding author

Tomasz Karski, Vincent Pol University, Lublin, Poland, E-mail: tmkarski@gmail.com

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## Abstract

*In years 1984 – 1995 were gathered first information about the biomechanical etiology of the so-called idiopathic scoliosis. In years 1995 – 2007 were found all importance of knowledge about etiology, new classification, and new therapy. The development of scoliosis is connected with “asymmetry of movement” of the hips and this is the part of asymmetries described by Professor Hans Mau as “Seven Contracture Syndrome” (German Siebenersyndrom). Next scoliosis develop because of “permanent standing ‘at ease’ on the right leg” and during “gait”, when blocked moment of the right hip, as compensatory movement, is transmitted to pelvis and the spine-making / acting the spine deformity.*

**Keywords:** So-called idiopathic scoliosis, biomechanical etiology, new classification, new therapy, causal prophylaxis.

## Introduction

The etiology of “idiopathic scoliosis” over years was a big secret [1-10].

The biomechanical etiology of the so-called idiopathic scoliosis [Adolescent Idiopathic Scoliosis (AIS)] was also the subject of the author’s research since 1984 [11-29].

First observations was made during scholarship visit in the Invalid Foundation Hospital in Helsinki. Next observations were made in Poland from 1995 to 2007. In this year (2007) I finished the observations and in next years till 2019 I could confirm on many cases, all the reflection upon spine deformity. First publication was in Germany in 1996 Orthopädische Praxis. In years 1995-2007 was given all observations according etiology, new classification and rules of therapy and causal prophylaxis.

## Material

In the years 1984 - 2018, more than 2500 patients with scoliosis have been observed and treated. The were children - 80% and adults- 20%. These older patients were asking for the help because of spinal pain. Control group 505 persons.

In all cases of scoliosis the same etiological factor has been present. In many children additional causes connected with the Minimal Brain Dysfunctions (MBD): a/ primary “extension contracture of the trunk”, b/ anterior tilt of pelvis”, c/ “laxity of joints”, was found.

## History of Observations about Etiology of Scoliosis.

**1995** – First lecture about biomechanical etiology of the so-called idiopathic scoliosis was giving during Orthopedic Congress in Szeged, Hungary.

**1996** – First publication in Germany – Karski T.: Kontrakturen und Wachstumsstörungen im Hüft- und Beckenbereich in der Ätiologie der sogenannten "Idiopathischen Skoliosen" - biomechanische Überlegungen, Orthopädische Praxis, 3/96, 32:155-160.

**1997** – It was stated that all scoliosis children have the habit to stand, at ease’ only on the right leg.

**2002** – Describing of “S” scoliosis in 1st group and “C” and “S” in 2<sup>nd</sup> / A and B group and types of scoliosis in new classification

**2004** – Describing of “I” scoliosis in 3rd group in new classification.

**2006** – Finished observations about the influences going from the hips and pelvis to spine though function – “gait” and “standing ‘at ease’ on the right leg”. Description of the “model of hips movements” and “the type of scoliosis”.

**2007** – Explanation why blind children do not have scoliosis. Answer: other gait than by normal healthy children. The walking is without lifting of legs. It is no influence acting on pelvis and on the spine. Description of the indirect influences going on the spine from the Central Nerve System (CNS) in children with Minimal Brain Dysfunction (MBD). These are: **a)** extension contracture of the trunk in small children, youth and adults, **b)** anterior tilt of the pelvis – children and adults. **c)** laxity of the joints – children and adults.

## Explanation of Biomechanical Influences in Development of Scoliosis

There are three groups and four types of scoliosis connected with special “model of hip movements” (T. Karski, 2006) (Figure 1, 3). Every type of scoliosis starts to develop in the 2nd – 3rd year of life of a child.

### The Development of Scoliosis in Points

**A)** Asymmetry of hip movements – smaller adduction in straight position of the right hip and limited internal rotation as one of the symptoms of “Syndrome of Contracture and Deformities” (SofCD) according Prof. Hans Mau from Tübingen (Germany) and Lublin observations (Figure 2),

**B)** Permanent standing ‘at ease’ on the right leg and asymmetric loading during gait,

**C)** Compensatory movement of pelvis and spine by gait - permanent rotation distortion of intervertebral joints – in result stiffness of the spine [30-32].

### New Classification – three groups and four types (Figure 1).

**(1) “S” 1<sup>st</sup> etiopathological (epg) scoliosis** - double curves, gibbous of the right side. 3D. Influenced by the “gait” and the permanent “standing at ease on the right leg”. Stiff spine. Progression.

**(2A) “C” 2<sup>nd</sup>/A epg scoliosis:** 1D. Influenced by permanently “standing at ease on the right leg”. One curve. Flexible spine. No or slight progression.

**(2B) “S” 2<sup>nd</sup>/B epg scoliosis:** 2D or mix. Influenced by permanently “standing at ease on the right leg”, plus - laxity of joints or/and incorrect exercises in previous treatment. Flexible spine. Moderate progression.

**(3) “I” 3<sup>rd</sup> epg scoliosis:** Influenced by the “gait” only. Stiff spine. No curves or small. No progression. Not included till 2004 to scoliosis group. In this group I treated many adults with back pain who tried to find the proper solution for the “pain syndromes”. This group need the new knowledge about scoliosis from the doctors, also internists. The patients need differential diagnosis, remembering that “stiffness of spine” is the special, very often “painful type of scoliosis” and the proper method of treatment is only physiotherapy, not medicaments. Various pharmacological methods of therapy are only additional method in the treatment.

### Physiotherapy

All previous extensions, this mean “muscle strengthening exercises” were incorrect and harmful, causing only bigger curves, bigger rib hump and made the spine more stiff (Figure 4, 5). All stretching exercises for the spine and hips are proper for treatment and prophylaxis just in small children (Figure 6a, 6b, 6c, 7). Very important in therapy are the following sport arts: karate, taekwondo, aikido, yoga (Figure 8). Very important is also standing ‘at ease’ on the left leg. In scoliosis cases the physiotherapy should be on the first place. Very beneficial are “exercises in geothermal water”. Proper therapy give good results, but important is to start with this therapy in age of 4 – 6 years (Figures 9a, 9b, 9c).

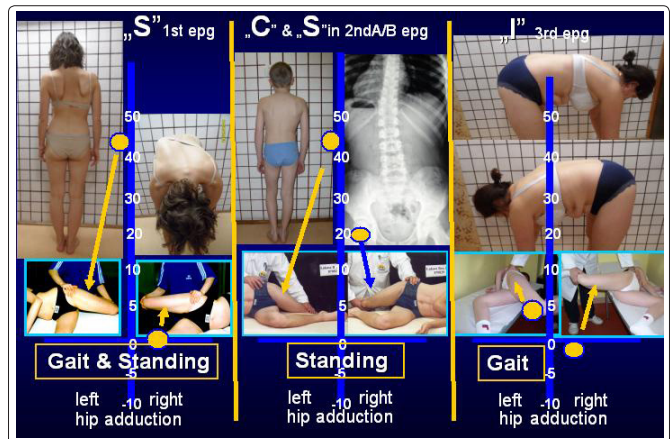
### Prophylactic Rules against Scoliosis in Points:

1. Standing ‘at ease’ only on the left leg.
2. Sitting relax – never straight up.
3. Sleeping in embryo position.

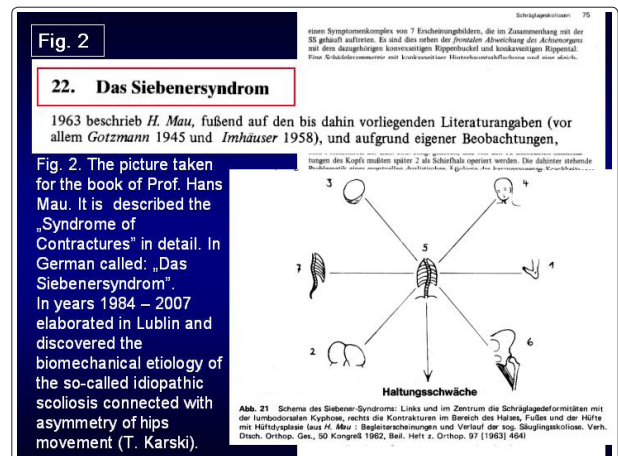
4. Active participation in sport in school and at home
5. Physiotherapy / Kinesio-therapy to obtain full, symmetrical movement of both hips and movements of spine – flexion, deviation, rotation. Especially important is to recover the full adduction and internal rotation movement of the right hip (Figure 6a, 6b, 6c).
6. Very beneficial are karate, aikido, kung fu, taekwondo, yoga.

### Discussion

The knowledge about etiology of the so-called idiopathic scoliosis is presented by author – widely, in many countries, from 1995. The problem from 2006 is presented in Website [www.ortopedia.karski.lublin.pl](http://www.ortopedia.karski.lublin.pl) with disillusion I see that in Poland the causal prophylaxis and new treatment of scoliosis is till now not introduced, the children are treated by old, wrong exercises, by corset and many of these are operated on. But with satisfaction I can state that my articles are with interest published (2009 - 2019) in USA. Many of scientists like Professor Martha Hawes and Professor Jan Stokes from USA, Professor John Sevastik from Sweden, Professor Stefan Malawski and Prof. Kazimierz Rapala from Poland - confirmed the new knowledge about scoliosis [10, 33-37]. I hope that now, from the USA, the new information about etiology of scoliosis and methods of causal prophylaxis will spread to other countries, including Poland.

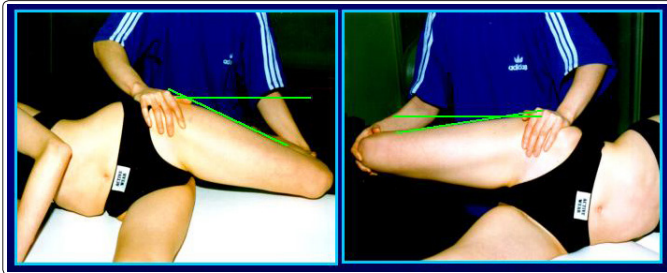


**Figure 1:** Range of adduction of the hips and type of scoliosis. Causative influence: „standing” and „gait”



**Figure 2:** The picture taken for the book of Prof. Hans Mau. It is described the “Syndrome of Contractures” in detail. In German called: “Das Siebenersyndrom” In years 1984 – 2007 elaborated in Lublin and discovered the bio-

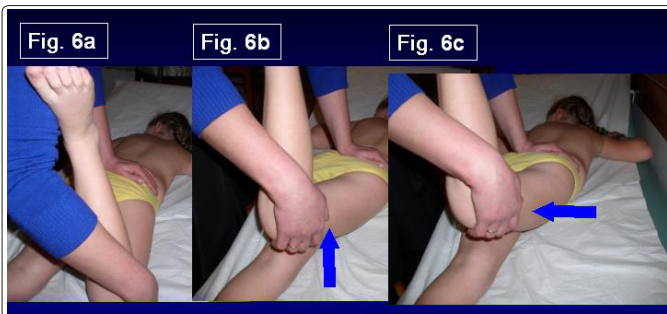
mechanical etiology of the so-called idiopathic scoliosis connected with asymmetry of hips movement (T. Karski)



**Figure 3:** The test to discover the difference of adduction of hips. Measurement of adduction in straight position of joints. This extension position of hips joints is typical / like in “standing” or in “stand phase” in walking



**Figure 4:** Two children. On Figure 4 child present the previous, wrong and harmful exercises recommended in “old methods of therapy”. **Figure 5:** The child Karolina 16 years old. Result of incorrect exercises 4 years in previous therapy. Child with iatrogenic deformity - deformed trunk, big curves, big rib hump and maximal stiff spine



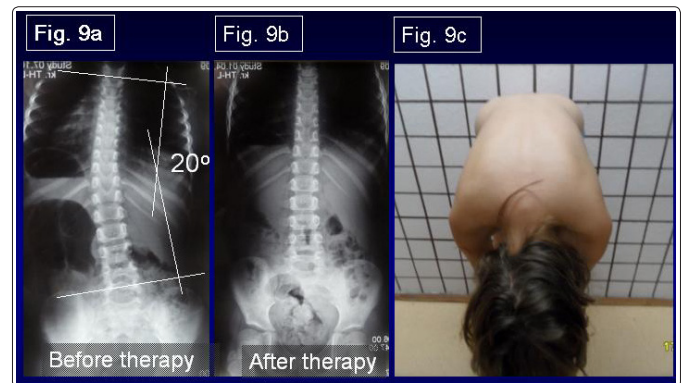
**Figure 6a, 6b, 6c:** Child Maia M. Age 8 y. Scoliosis „S” in 1<sup>st</sup> ep group. In treatment: stretching exercises (on picture) made by physiotherapists or by parents to receive full movement of adduction and internal rotation of the right hip. Arrows inform about the directions of stretching (Figure 6b, 6c). In therapy additionally: 1/ flexion exercises, 2/ sitting only relax, 3/ standing ‘at ease’ only on the left leg, 4/ sleeping in embryo position, 5/ sport - karate



**Figure 7:** Proper therapy for scoliosis in Sanatorium for Children of name of Dr Janusz Korczak in Krasnobród / Poland. Cooperation from 1977. In program of therapy 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 every day situations



**Figure 8:** Proper exercises for scoliosis – stretching exercises typical for karate, taekwondo, aikido, kung fu, yoga. These sport arts are the best prophylaxis methods in scoliosis and other deformations and dysfunctions in locomotors system. Pictures take from Internet and also prepared in own “Orthopedic Praxis”



**Figure 9a, 9b, 9c:** Girl 9 year old. History No 080108. Fig. 9a – scoliosis “C” type 2nd/A. Laxity of joints. Cobb angle 20 degree. Proper treatment 4 years: flexion exercises, standing on the left leg, karate. Figure 9b, 9c - after 4 years – normal axis of the spine, in X-ray and in “bending test”. Proper level of lumbar and thoracic parts of the body. Child without scoliosis, full active, happy

## Conclusions

1. Development of scoliosis and the types of spine deformity are connected with pathological “model of hips movements” (T. Karski, 2006) and function – “standing ‘at ease’ on the right leg” and “gait”.
2. Restricted range of movements in the right hip is connected with the “Syndrome of Contractures and Deformities” according Prof. Hans Mau and Lublin observations (T. Karski).
3. Every type of scoliosis starts to develop at the age of 2-3. The infantile scoliosis is not the “So-Called Idiopathic Scoliosis”.
4. There are three groups and four types of scoliosis (see text above).
5. The causal prophylaxis of scoliosis is possible and should be introduced in every country.

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