

Present day explanation of the clinical signs in the biomechanical aetiology of the so-called idiopathic scoliosis (1995 – 2011). The relationship between the “model of hips movement” and the character of scoliosis; three groups and four types. The causative role of “gait” and “standing ‘at ease’ on the right leg”

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Abstract

The observations from 1985 - 1995 and till 2012 clarify that the development of so-called idiopathic scoliosis is connected with “gait” and habitual permanent “standing at ease” on the right leg. The scoliosis is “a result” of asymmetry of “function” – “changed” loading during gait and asymmetry in time during ‘at ease’ standing, more prevalent on the right leg. Every types of scoliosis is connected with the adequate “model of hips movements” [MHM] (*Karski and coll.*, 2006 [1]). This new classification clarifies the therapeutic approach to each types of scoliosis and provides the possibility to introduce causative prophylaxis.

1. Introduction

The “biomechanical influences for development of scoliosis” is presented since 1995 (Congress in Hungary) till now. The aetiology is connected with asymmetry of movements of left and right hips, pelvis and sides left / right of trunk during gait and asymmetry time of “standing at ease” - left leg versus right leg (Karski, 1997). Because of abduction contracture or restricted adduction, the right hip and though that the right leg is “more stronger”, “more stable”, and consequently “more easy for standing”. This asymmetry of movements and asymmetry of function is connected with the “syndrome of contractures” in newborns and babies (*Originally in German - “Siebenersyndrom” – Mau [2, 3]*).

2. Information about “Syndrome of contractures”

As mentioned above the “biomechanical influences in development of scoliosis” are connected with “syndrome of contractures” described by many authors (*Hensinger [4], Howorth [5], Green & Griffin [6], Heikkilä E. [7], Tarczynska M., T. Karski, M. Frelek - Karska [8]*), but in detail by *Prof. Hans Mau – Tübingen / Germany - as Siebener [Kontrakturen] Syndrom*” (syndrome of seven contractures) [2, 3].

Mostly it is the “left sided syndrome of contractures” as a result of left position of fetus in mother’s uterus 80% - 90% cases (*J. Oleszczuk, Lublin [9]*). The list of deformities and “asymmetries” are:

1. skull deformity (*plagiocephaly*),
2. *torticollis muscularis (wry neck)*,
3. infantile scoliosis – other than idiopathic scoliosis,
4. contracture (shortening) of adductor muscles of the left hip
5. contracture (shortening) of abductor muscles and soft tissues of the right hip (*Karski [10, 11]*), described as *Haltungsschwäche* (“weak posture”) by Mau.
6. pelvic bone asymmetry – the obliquity of pelvis,
7. foot deformities. In 2006 excessive varus shank deformity (*crura vara*) was added to the “syndrome of contractures” list, which with the time can lead to Blount disease (*T. Karski and coll. [12]*).

3. Clinical signs of “syndrome of contractures” in children with so-called idiopathic scoliosis

Some authors in the past were able to observe the “symptoms of asymmetry” in different places of child’s body having “idiopathic scoliosis”. The list of authors is as follows: *Willner* [13], *Magoun* [14], *Wynne-Davies* [15], *Tylman D.* [16], *Tarczyńska & Karski & Frelek-Karska* [8], *Gardner A.* [17], *Dangerfield P. and coll.* [18], *McMaster* [19], *Barlow T. G.* [20].

4. Other accompanying deformities, and accompanying illnesses having influence on development of the so-called idiopathic scoliosis

These are: (a) joint laxity – makes less stable conjunctions between parts of child’s body, (b) rickets – makes “too plastic bones” which can be more susceptible for deformity, (c) pelvis and lumbar spine anatomy anomalies (*spina bifida occulta*) – make that spine is less resistant for deformity, (d) the same makes changes in chest and ribs if there are deformed (*pectus infundibiliforme*) (e) “straight position of trunk (of spine)” in babies and small children with minimal brain deformities or with ADHD can later enables development of scoliosis (*Karski* [21, 22, 23]).

5. Material. Study of children with so-called idiopathic scoliosis

The complete study’s material in 2012 consist of almost 2000 children and adults with scoliosis (N = 1950) from the years 1985 – 2012. The control group (N = 150) – were children examined with “spine problems” – but without any scoliosis.

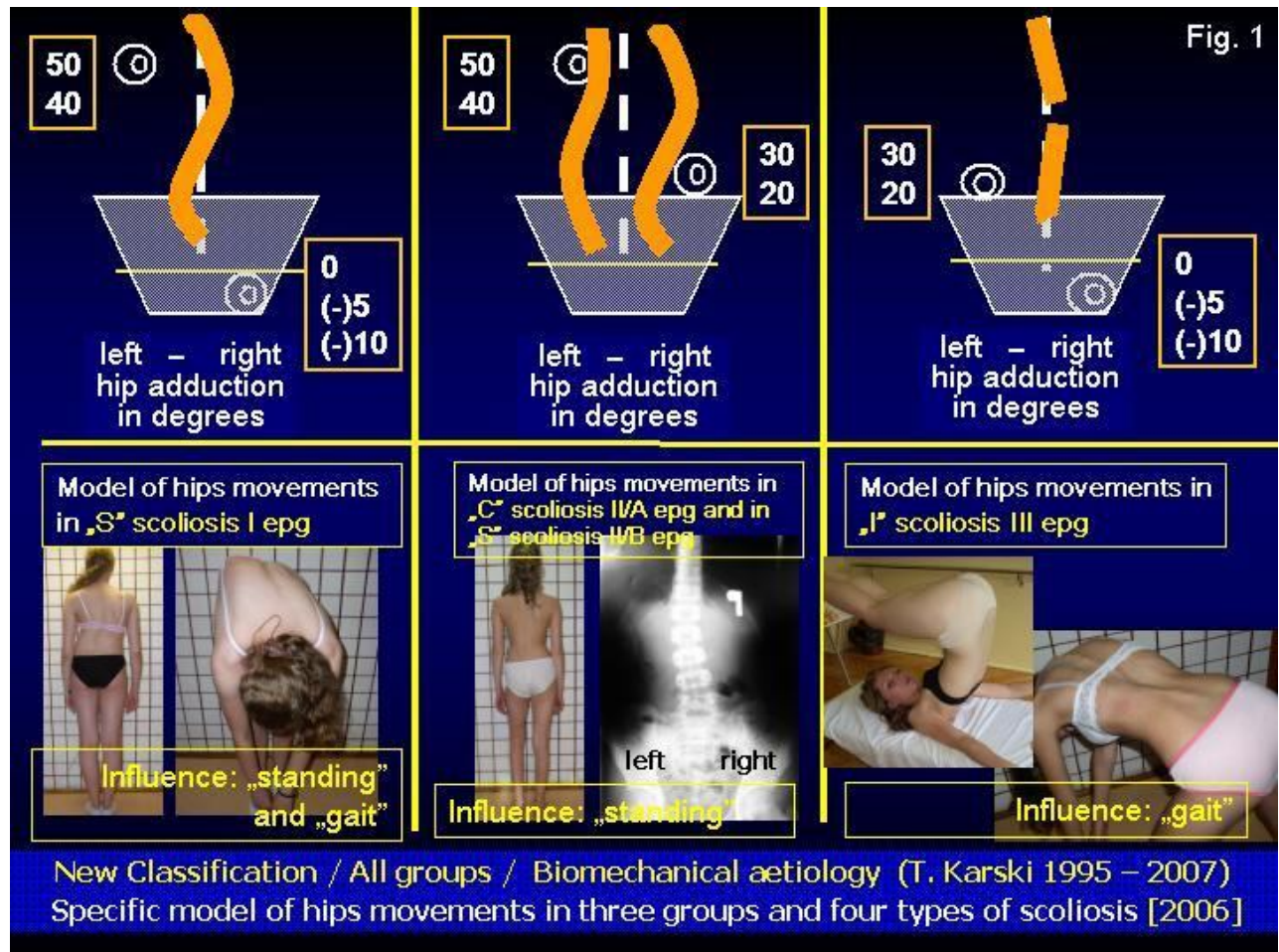
6. New classification. Three etiopathological (epg) groups, four types of scoliosis connected with adequate “model of hips movements

I-st etiopathological group of scoliosis (“S” - I epg) [Fig. 1] (*Karski- observations 1995 - 2012*) [“S” deformity = double curve scoliosis]. Cause of deformity: “gait” and “permanent standing on right leg”. The clinical signs in this group are: stiffness of spine with “flat back” because of rotation deformity, as a first signal of scoliosis, but the origin of this deformity lies not in the shoulder (*Burwell and coll.* [24, 25]) but in the pelvis (*Karski* [21, 22, 23]). Restricted movements in the right hip (insufficient: adduction, internal rotation and extension) is transmitted “as compensatory movements” on to pelvis and spine and with the time it causes “rotation deformity of spine”. Nevertheless the deformity originating in the shoulder can play an “additional and supportive” role. Similarly - the contracture in the thorax play “supportive role” for progress and fixation of thoracic curve (*Sevastik and Diab* [26]). Some case in “S” I epg group are “lordoscoliosis”. Both curves arrive at the same time and very early - 2 to 3 years of age. Also presenting early in life is *gibbus costalis*. This type of scoliosis is progressive especially during the acceleration period of growth.

II-nd etiopathological group of scoliosis – “C” - II/A epg and “S” - II/B epg [Fig. 1] (*Karski- observations 1995 - 2012*). Cause of deformity: “permanent standing on right leg” for many years. The clinical signs in this group are: “C” left convex curve in lumbar or lumbar – thoracic part of spine, or “S” scoliosis (thoracic deformity second) in children with “laxity of joints” or / and after “harmful exercises”. The first symptoms of this scoliosis present after 10 years of standing.

III-rd etiopathological group of scoliosis [Fig 1] (*Karski- observations 1995 - 2012*). *Karski*. The spine deformation in this group is with little or no curvature". Cause of deformity: "gait" but not "standing" because the stability of hips - left / right - during standing is similar and therefore no "predominance of standing on the right leg" is evident.

The main symptom in this group is "stiffness of spine". In this group clinically and radio-graphically we see no curves, or only slight deformities. We also see little or no rib hump.



7. New tests for scoliosis – short information [21]

In the diagnosis of scoliosis we should use known examinations techniques (*Adams & Meyer* test [27, 28]), as well as new tests such as “side bending test for scoliosis”, checking for the habit of standing (right versus left leg), the *Elly-Duncan* [21] test (or *Thom* test or *Staheli* test), *pelvis rotation* test (new test – 2006), “adduction of hips test – similar to *Ober* test” [21] and others.

8. New rehabilitations exercises – short information [21]

All extension exercises and “strengthening exercises” recommended in the past have been wrong and incorrect. New exercises were introduced in the years 1985 – 1995 and have been performed in our Department. These are exercises that remove contractures in the region of the hips, pelvis and spine. There are also flexion- rotation exercises for the spine and these have proven to be very effective for all endangered children, especially those in early childhood; 3-rd or 4- th years.

Over the years we have also made numerous observations and confirmations that the solution for “spine problems” is only prophylactics, based on the “biomechanical aetiology of scoliosis”.

9. Conclusions

1. The aetiology of so-called idiopathic scoliosis is strictly biomechanical and the explanation is based on asymmetrical movements of the hips during gait and asymmetry of standing on legs – more on the right leg.
2. The groups of scoliosis in new classification (2001 – 2004 / 2006) are determined in connection with “model of hips movements” (Karski, 2006).
3. There are three group and four types of scoliosis: “S” - I epg, “C” - II/A epg – “S” - II/B epg and “I” – III epg.
4. All at-risk children should be included in an early program of “prophylactics” using stretching exercises. Active sports like: karate, kung fu, taekwoon do, tai chi, aikido, yoga etc. are also very beneficial.

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Fig. 1 Three group and four types of scoliosis connected with “model of hips movements”. Causative influence: for “S” scoliosis I epg – “gait” and “standing on right leg”, for “C” II/A epg and “S” II/B epg scoliosis – “standing on right leg”, for “I” III epg scoliosis – “gait” only.

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