

Biomechanical aetiology of the so-called idiopathic scoliosis: Classification, rules of treatment and prophylaxis

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Explanation of biomechanical aetiology of scoliosis in points. The spine deformity called adolescent idiopathic scoliosis (AIS) develop under the influence of biomechanical factors. This biomechanical factors / causes are:

(A) permanent standing 'at ease' on the right leg

(B) influence appearing during gait.

These both causal influences are based on

(C) asymmetry of time standing – more on the right leg and on asymmetry left / right side of loading of body during walking.

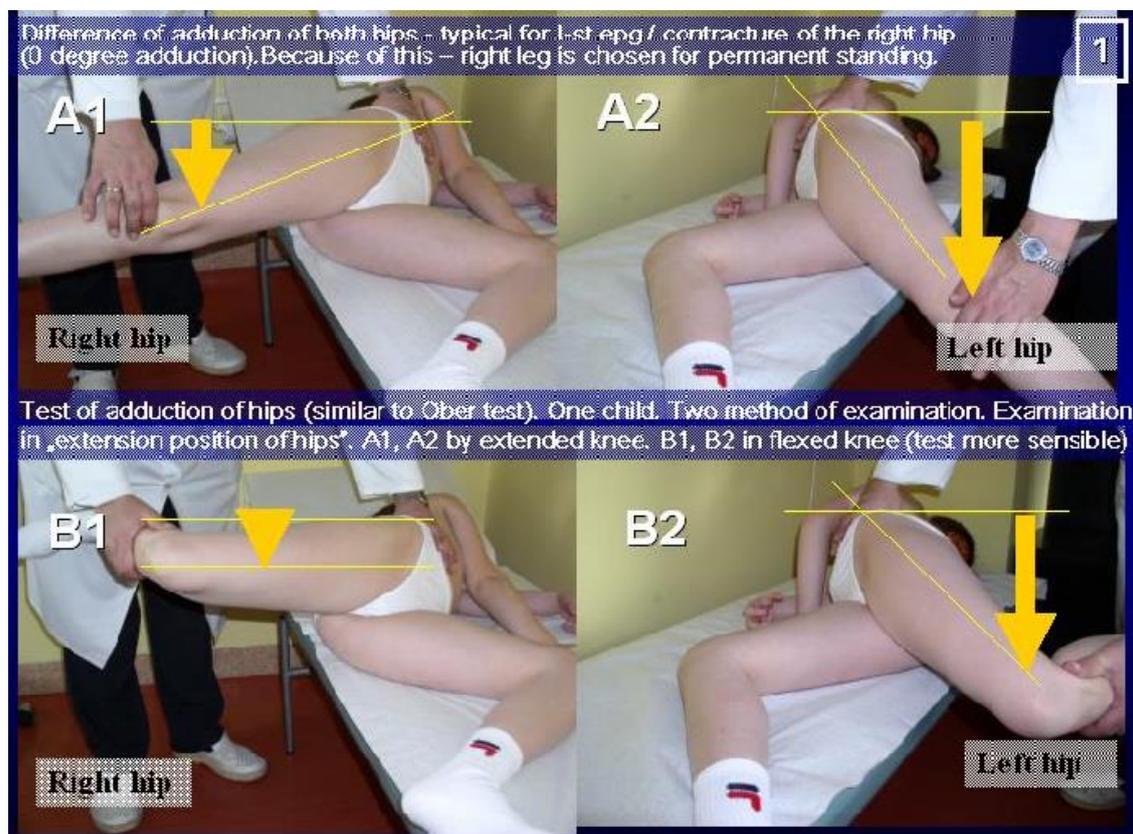


Fig 1 – Test of adduction of hips (similar to Ober test). One child. Two method of examination. Examination in extension position of hips”. A1, A2 by extended knee. B1, B2 in flexed knee (test more sensible).

(Fig.1). To check this asymmetry the examination should be performed in straight position of hip joint. It should be noted that the checking in this position is similar / is the same like in “standing” and also similar in “stand phase of walking”. In some children there is even abduction contracture of right hip, plus external rotation and flexion contracture (see later - in I epg).

(3) Pathological influence on spine as mentioned above is coming by walking (gait) and because of habit of permanent standing 'at ease' on the right leg.

(4) There are various types of scoliosis – some connected with “walking”, other connected with “standing”.

(5) Every type of scoliosis starts to develop in 2 - 3 years of age in children.

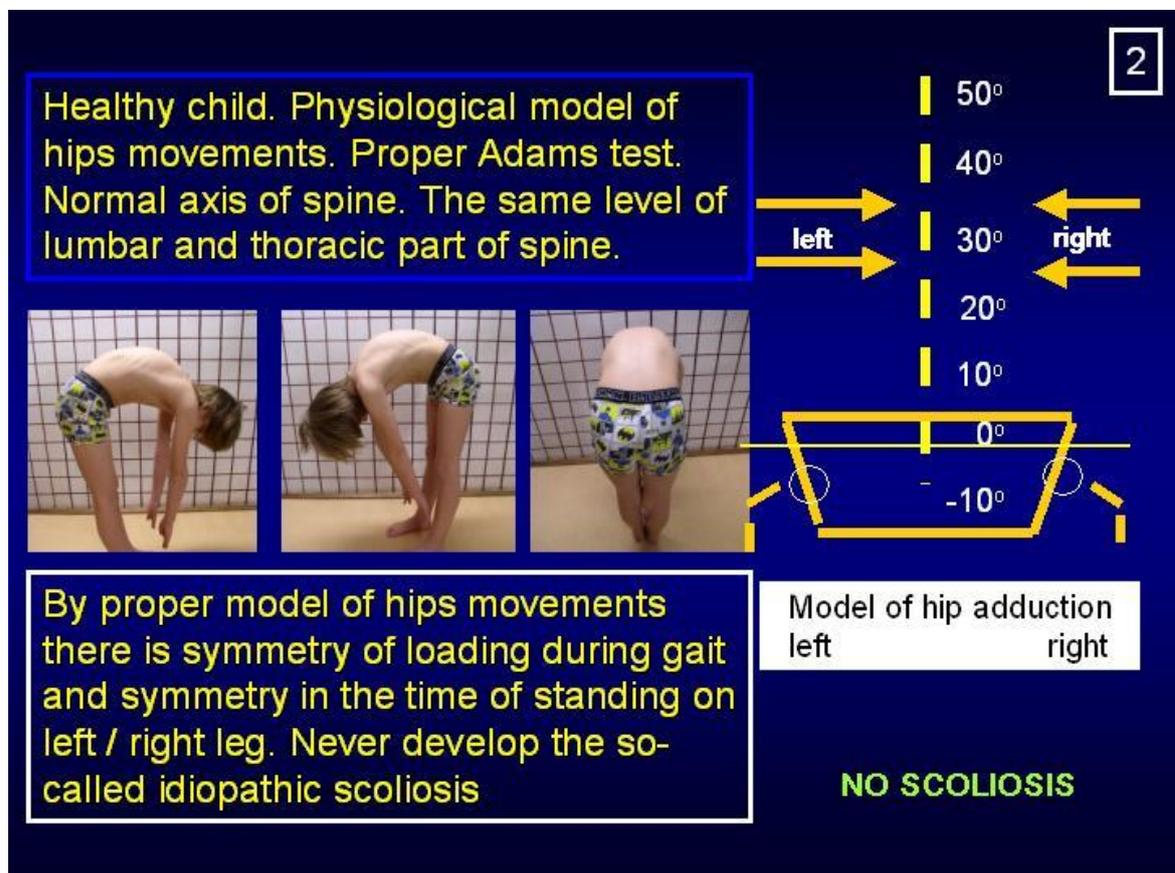


Fig. 2: Physiological model of hips movements – never so-called idiopathic scoliosis.

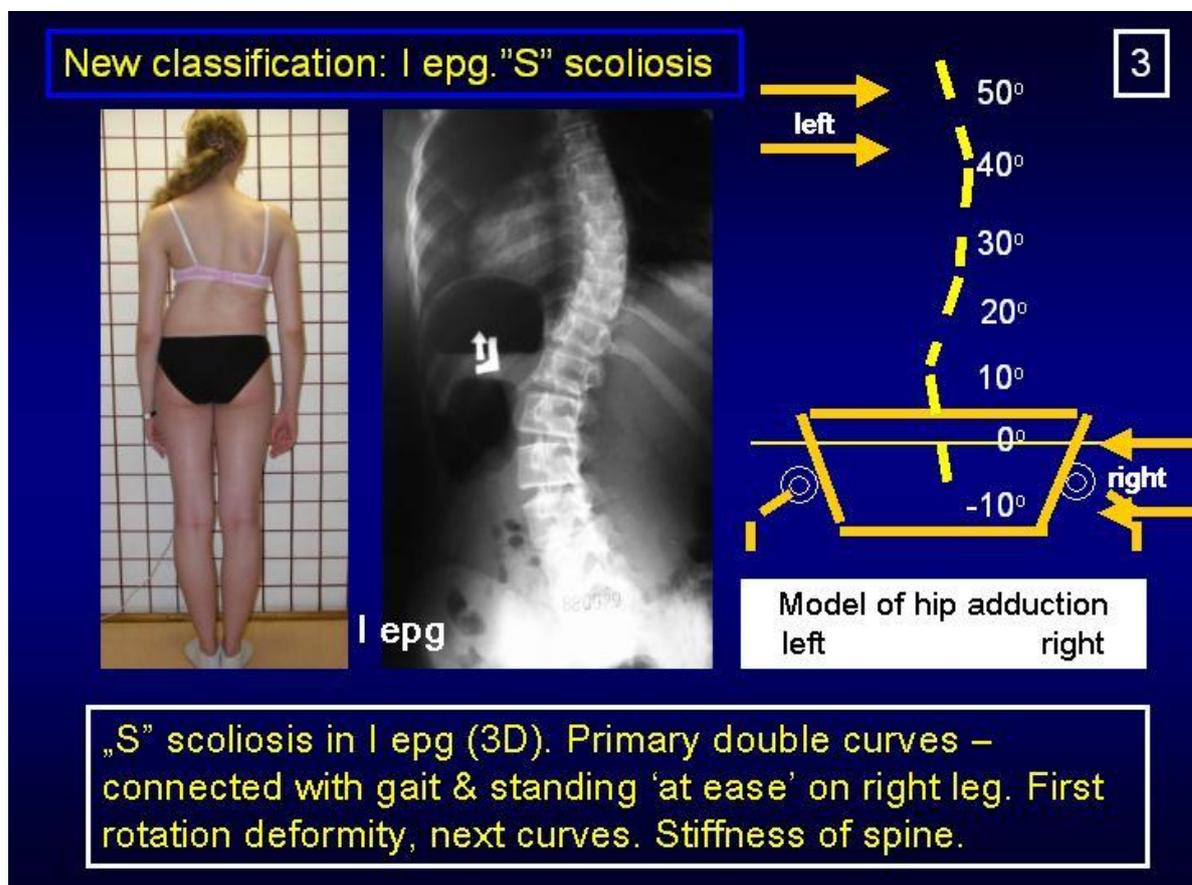


Fig. 3 – I epg deformity - "S" scoliosis connected with specific model of hips movements. Two curves. Stiff spine. 3D. Causal influence: "gait" and "standing 'at ease' on the right leg". Progression.

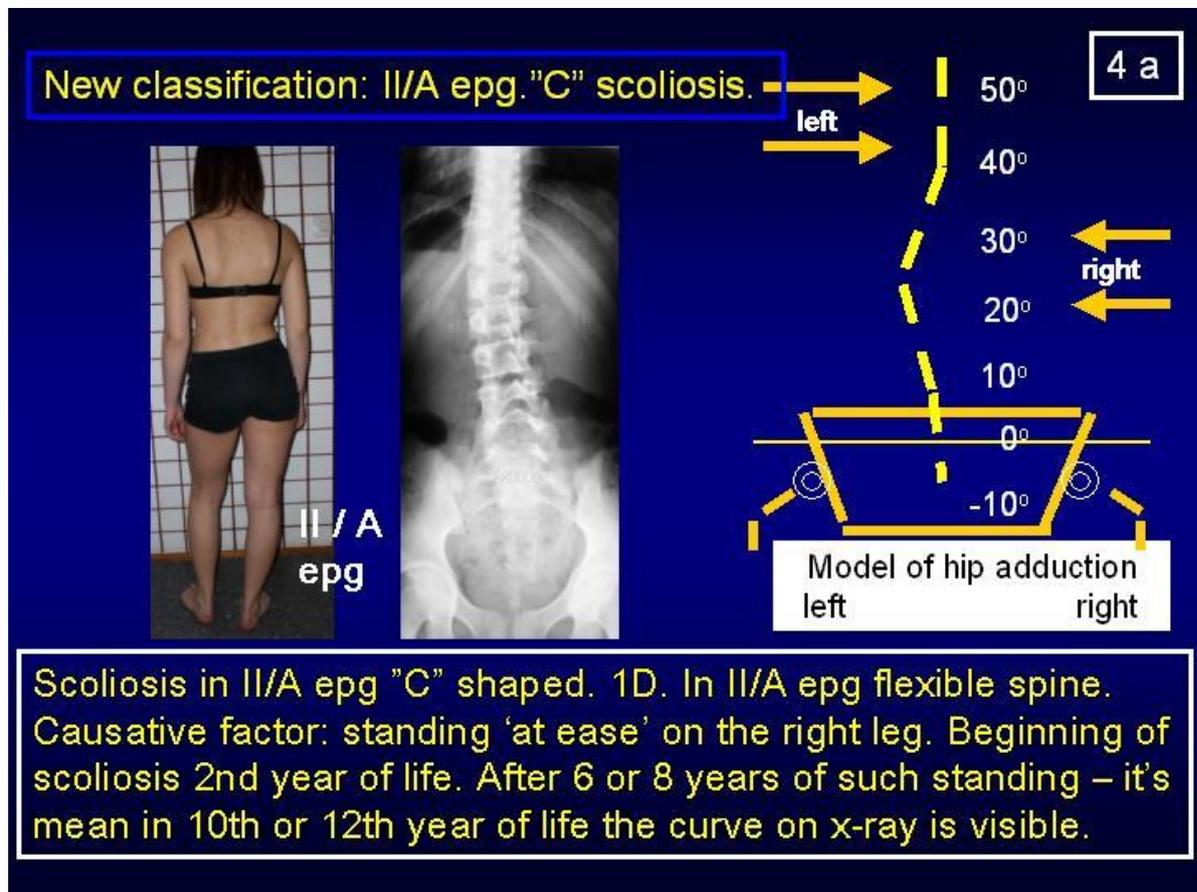


Fig. 4a – II/a epg deformity - "C" scoliosis connected with specific model of hips movements. One curve. Flexible spine. 1D. Causal influence: permanent "standing 'at ease' on the right leg". No progression.

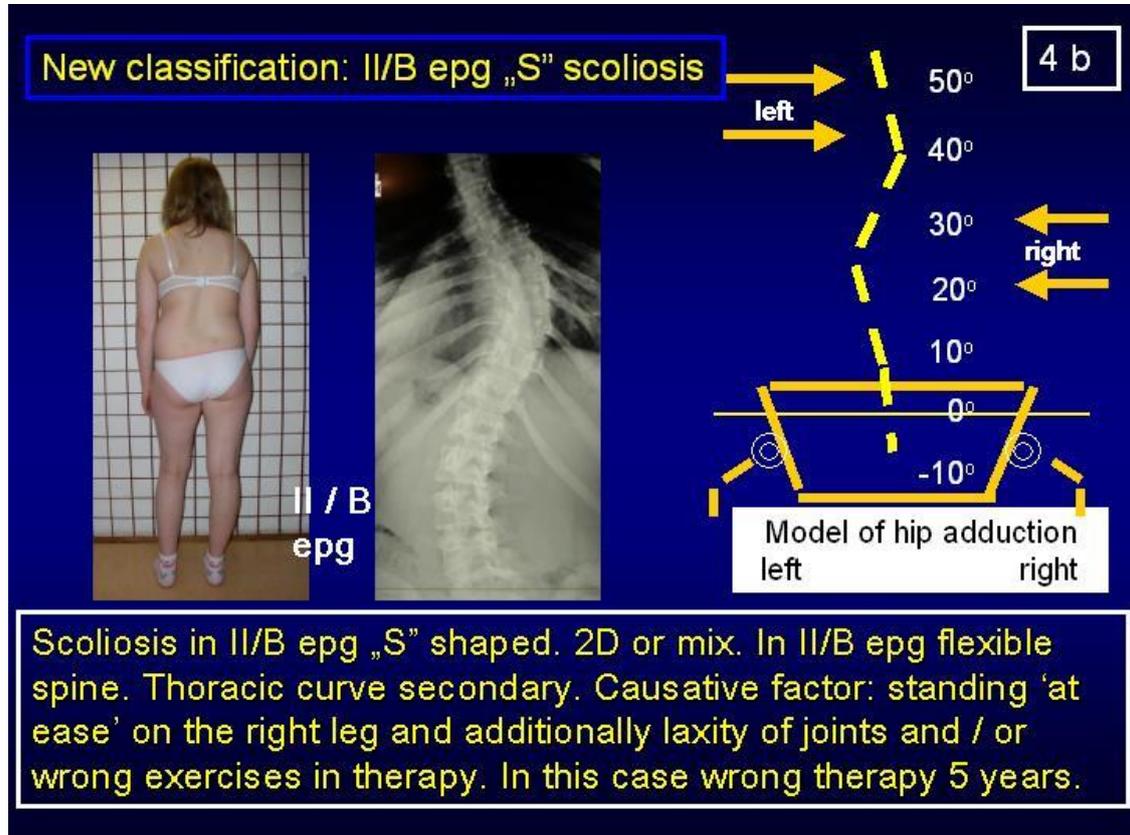


Fig. 4b – II/b epg deformity - "S" scoliosis connected with specific model of hips movements. Two curves. – thoracic secondary. 2D or mix. Causal influence: permanent "standing 'at ease' on the right leg" and flaccidity of joints. No progression, or small.

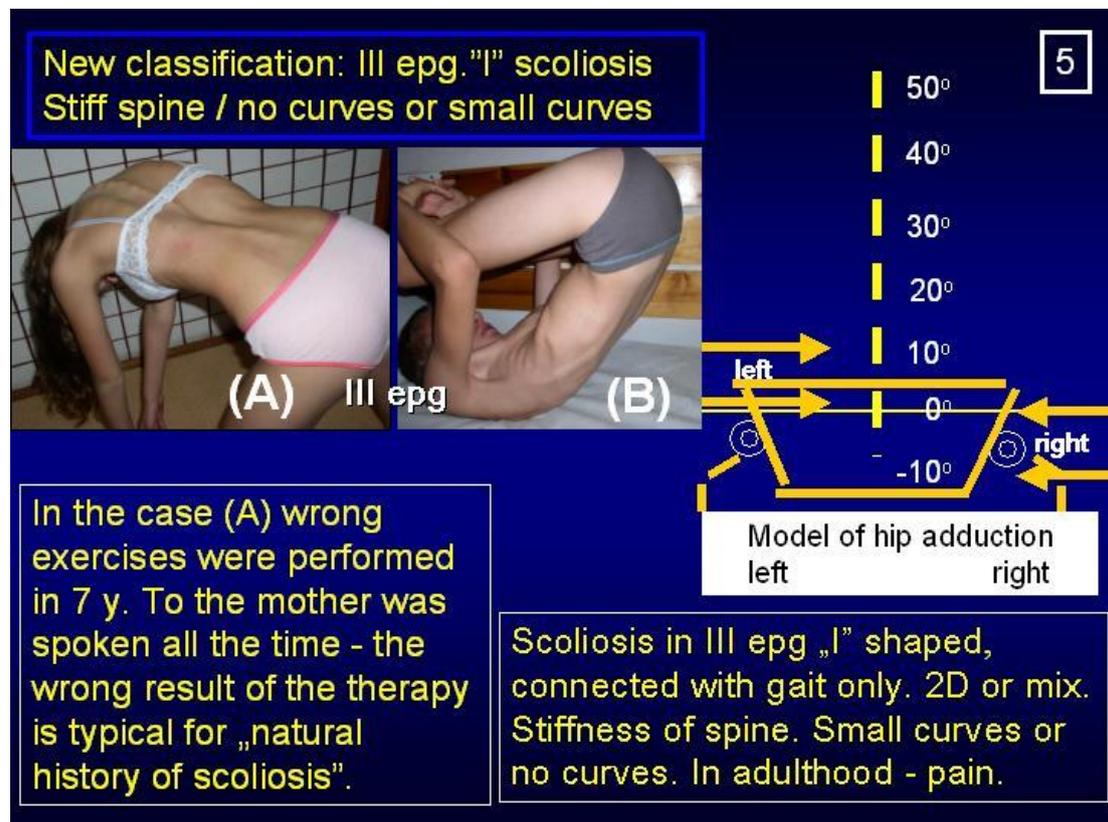


Fig. 5 – III epg deformity - “I” scoliosis connected with specific model of hips movements. No curves or small. Stiff spine. 2D or mix. Causal influence: “gait”. No progression. Till now not included to scoliosis.

New classification as important information for physiotherapy [4, 5, 6, 7, 8, 9, 10]. There are three groups and four types of scoliosis (T. Karski 2001 – 2004). To understand the biomechanical pathological influence in development of scoliosis we present also the child from control group without scoliosis to show the “physiological model of movement of hips” protecting before so-called idiopathic scoliosis (Fig. 2)

(1) “S” I etiopathological (epg) scoliosis (Fig. 3) . Double curves. Influenced by the “gait” and the permanent “standing at ease on the right leg”. Stiff spine. 3D. Progression.

(2A) “C” II/A epg scoliosis (Fig. 4 a). Influenced by the permanent “standing at ease on the right leg”. One curve. Flexible spine. 1D. No or slight progression.

(2B) “S” II/B epg scoliosis (Fig. 4 b). Influenced by the permanent “standing at ease on the right leg”, plus - laxity of joints or/and incorrect exercises in previous treatment. Flexible spine. 2D or mix. Moderate progression.

(3) “I” III epg scoliosis (Fig. 5). Influenced by the “gait” only. Stiff spine. No curves or small. No progression. Not included till now to scoliosis.

Physiotherapy: All previous methods of treatment – for example the extensions, its mean “muscles strengthening exercises” were incorrect and very harmful. They caused only bigger curves and made the spine more stiff.

Because of this the orthopaedic surgeon used to speak about “Natural History of Scoliosis” to explain the parents and treated children wrong result of the therapy.

Instead of such therapy - all stretching exercises for spine and hips are proper for treatment and for prophylaxis. These exercises lead to symmetry of movements and

symmetry of function and therefore protect before scoliosis. To these methods belong all exercises removing flexion contractures of both hips, removing abduction contracture or only “too small range of adduction” of right hip, removing external contracture of right hip and extension contracture of whole spine. The rigidity of spine, very often is the first step on the way to scoliosis (in “S” I epg scoliosis). So, flexion exercises for spine should be introduced already in small children in age of 2- 4 years. Also is very important to remember by doctors and parents about position of standing – all children on the world should stand ‘at ease’ only on the left leg. Such **standing is not permanent** and do not lead to scoliosis. Standing ‘at ease’ on the right leg is permanent and after some years is a very important cause of scoliosis.

Conclusions

- (1) All scientists and all Institutions engaged with scoliosis should learn about biomechanical reasons in development of so-called idiopathic scoliosis.
- (2) The “biomechanical aetiology” of the so – called idiopathic scoliosis answers all questions in problem of this spine deformity.
- (3) All orthopaedic surgeons, physiatrist and physiotherapist should introduce the new conception of treatment and the causal prophylaxis in children with so-called idiopathic scoliosis, on basis of own material the new point of view to the scoliosis – screening tests and new rules of treatment.
- (4) Causal prophylaxis in the so – called idiopathic scoliosis is possible and should be introduced in all countries of the world.