

BOLESTI PÁTEŘE V SOUVISLOTI S TZV. IDIOPATICOU SKOLIÓZOU A DALŠÍ PŘÍČINY SPOJENÉ S MINIMÁLNÍ DYSFUNKCÍ MOZKU. PŘÍZNAKY. RADY PRO LÉČENÍ

BACK PAIN IN THE CONTEXT OF THE SO-CALLED IDIOPATHIC SCOLIOSIS AND OF ADDITIONAL CAUSES CONNECTED WITH MINIMAL BRAIN DYSFUNCTION. SYMPTOMS. ADVISES FOR THERAPY

Karski Jacek¹, Karski Tomasz², Karska Klaudia³, Kulka Małgorzata⁴, Karska Katarzyna⁵, Menet Honorata⁶

¹ Karski Jacek, Assistant in Pediatric Orthopedic and Rehabilitation Department of Medical University in Lublin, Poland. e-mail: jkarski@vp.pl

² Karski Tomasz, Professor Lecturer in Vincent Pol University in Lublin, Poland tmkarski@gmail.com, t.karski@neostrada.pl

³ Karska Klaudia, Assistant in Radiology Department of Medical University in Lublin, Poland. e-mail: clovdia@o2.pl

⁴ Kulka Małgorzata, Assistant in Neurology Department of Medical University in Lublin, Poland. e-mail: malgkulka@gazeta.pl

⁵ Karska Katarzyna, Assistant in Medical University in Lublin, Poland kakarska@gmail.com

⁶ Menet Honorata – Caen University, France. e-mail: honoratkamenet@gmail.com

ABSTRACT

Back pain is a frequent problem of patients in orthopedics and neurology departments. In our opinion – the causes of the pain in the spine are connected with various anatomical disorders like bigger or smaller physiological curves – lumbar hiperlordosis or hipolordosis, thoracic hiperkifosis or hipokifosis, or because of scoliosis in two etiopathological groups / types (epg) – like “C” and “S” scoliosis in 2nd / A / B / epg type in Lublin classification.

There are also other signalized causes of back pain – like spondylolisis, spodylolithesis, prolaps of nucleus pulpous, nonetheless, in the article, we focus on the two causes mentioned above. In our

research we found that etiology of scoliosis is connected with biomechanical factors – “permanent standing ‘at ease’ on the right leg” and walking / gait, which is described in the article.

Key words: Back pain. Hiperlordosis of lumbar spine. Scoliosis. Possibility of therapy and prophylaxis.

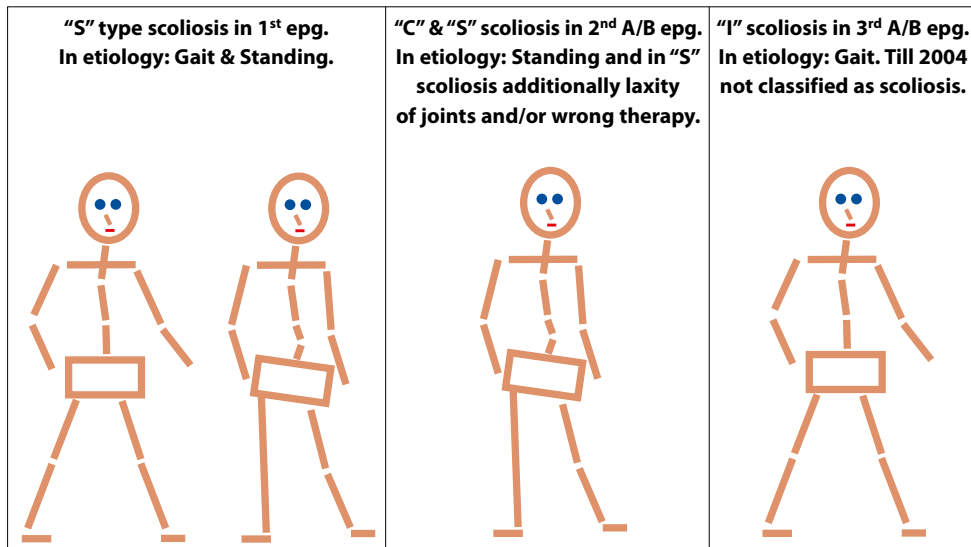


Fig. 1: Three (3) groups and four (4) types of the So-Called Idiopathic Scoliosis. Reason: “standing” and “walking”. Additionally laxity of joints and/or incorrect therapy. Abbreviaiton: epg – etiopathological group.

BACK PAIN

Material

In our orthopedic praxis we treat younger patients in age 20–25 with problems of spine deformity and adults in age 50–70 with problems of spine pain. Material of spine pain patients – together 784..

The problem of back pain is connected mostly with abnormalities of spine anatomy – hiperlordosis of lumbar spine and scoliosis “C” and “S” in 2nd etiopathological group / type (epg) in Lublin classification. Back pain can appear also in the case of stiffness – a symptom typical for “I” scoliosis in 3rd epg group / type in new Lublin classification. What leads to the stiffness of spine? – the lack of adduction and internal rotation movement of the right hip or both hips, transmitted to pelvis and spine during gait. This movement is characterized by the “distortion movement” in the intervertebral joints during every step – which results in stiffness.

Other causes of back pain are connected with the spondylolysis and spondylolisthesis, with congenital malformations of spine or thorax. Until now, Polish neurologists neurosurgeons diagnosed mostly the “prolapsed nucleus pulposus” and proposed surgery as therapy in each case, however without explaining the causes of the “prolapsed nucleus pulposus”. Our research gives the explanation. The primary causes of back pain are: scoliosis or lumbar hiperlordosis. These abnormalities, causes, are the ones which require treatment, not their result.

**Etiology of the so-called idiopathic scoliosis.
[Adolescent Idiopathic Scoliosis (AIS)] as important cause of “back pain”
(Fig. 1, 2a, 2b, 3, 4A1, 4A2, 4B1, 4B2, 5a, 5b)
[Literature: 10–44, 59]**

Till 2007 the etiology of scoliosis was the subject of the research of many scientists but they no found [Literature: 1–8, 42–55]. In years 1995–2007 the etiology was found after observation of

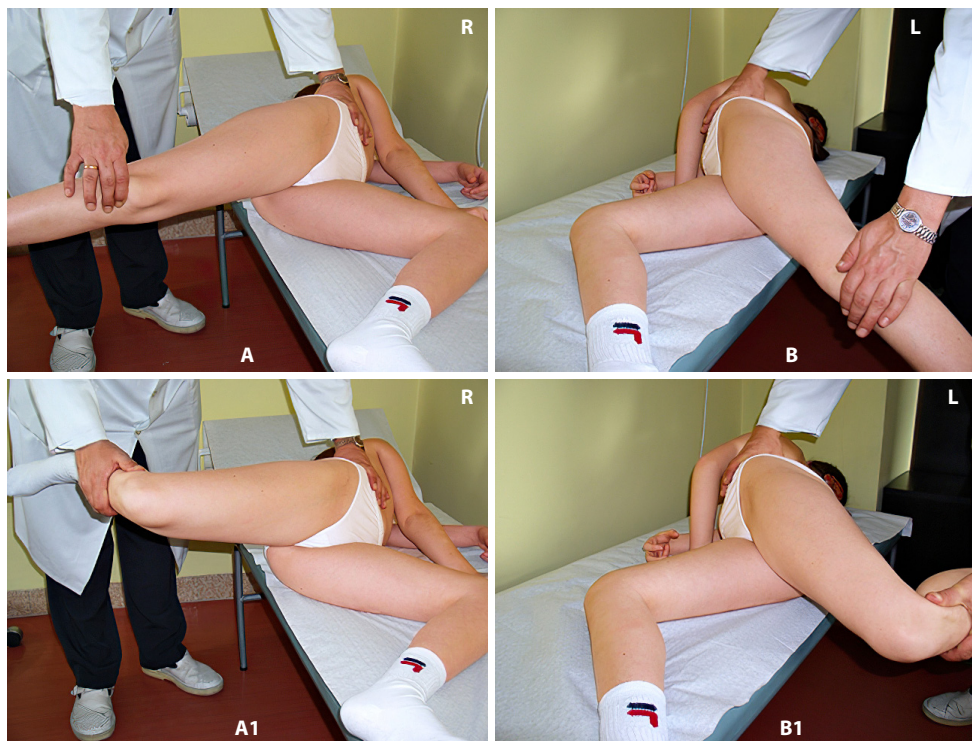


Fig. 2a. Test of adduction of hips in extension of knee (A, B) and in flexion (A1, B1). Such examination is like “standing” or “stance phase” in walking. There are three models of hip adduction (see text).
Abbreviations: (R) right hip, (L) left hip.



Fig. 2b.

“S” 1st epg. Influence: gait & standing.

Explanation: epg – ethiopathological group



Fig. 3. In the picture “S” scoliosis in 1st epg. Model of “hip adduction in extension position of joint” – maximally limited adduction of the right hip, full movement of the left hip. Etiological factors: gait & standing. On the picture boy after 5 years of incorrect therapy – big curves, sharp gibbous (arrow).

many patients – until 2020 – we have examined 2500 patients aged 2–80 in “scoliosis group” and it was found that “idiopathic scoliosis” is connected with the asymmetrical movement of hips and next with function – permanent “standing ‘at ease’ on the right leg” and “gait” [10–41]. A question appears: Why “standing”? In all scoliosis children, we found a limitation of adduction of the right hip, or even abduction contracture of this joint 5–10 degrees. It is one of the symptoms of “The Syndrome of Contractures and Deformities” [S of CD] according to Prof. Hans Mau from Tübingen, Germany (34–36) and Lublin observations [T. Karski, J. Karski – 10–41]. The straight position in examination should be similar to the “standing position” or to the “stance phase in walking”. The “cumulative time” of standing on the right leg is the cause of scoliosis in two groups and three types (**Fig. 1, 2a, 2b, 3, 4A1, 4A2, 4B1, 4B2**) and in adults is the cause of “spine pain syndromes”

Additional causes in development of scoliosis. In development of So-Called Idiopathic Scoliosis, the biomechanical factors are the most important, but in many children, additionally, we see “neurological symptoms” – described as Minimal Brain Dysfunctions (MBD).

In Poland, almost 12% of children and adolescents born in the last 30 years have various CNS changes caused by the complications during pregnancy or/and delivery.

“C” & “S” 2nd epg. Influence: standing.

Explanation: epg – ethiopathological group

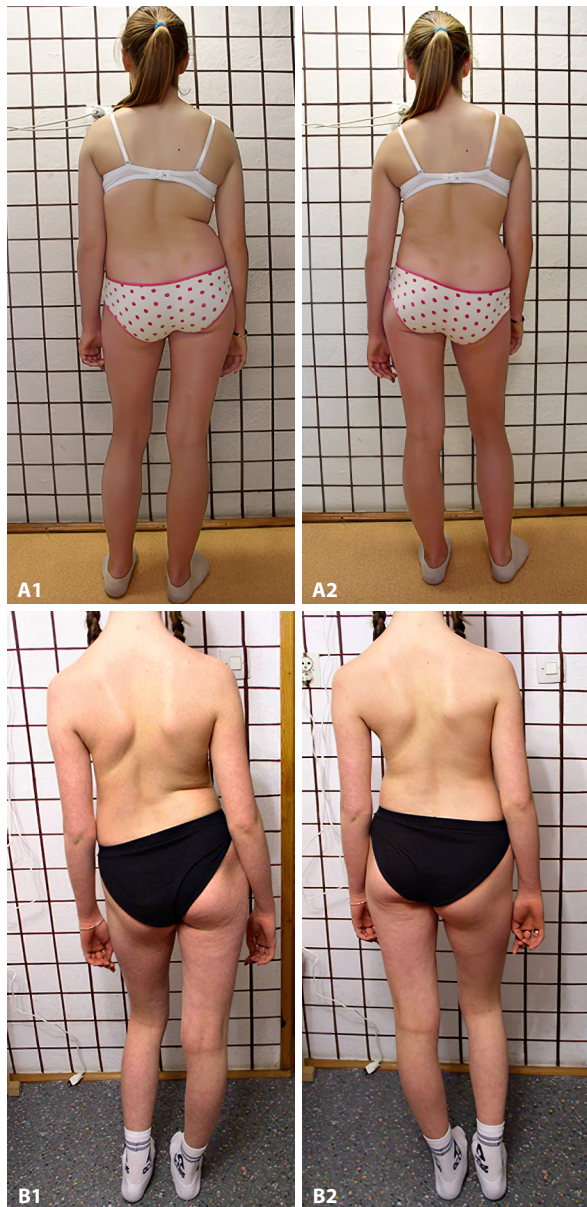


Fig. 4A1, 4A2, 4B1, 4B2. Example of “C” scoliosis (Fig. A1) and „S” scoliosis (Fig. B1) in 2nd A/B epg. Model of “hip adduction in extension position of joint” – partially limited adduction of the right hip, full movement of left hip. Etiological factors: standing ‘at ease’ on the right leg. In “S” scoliosis laxity of joints. On the pictures A2 and B2 corrective standing ‘at ease’ on the left leg.

"I" 3rd epg scoliosis. Influence: gait.

Explanation: epg – ethiopathological group

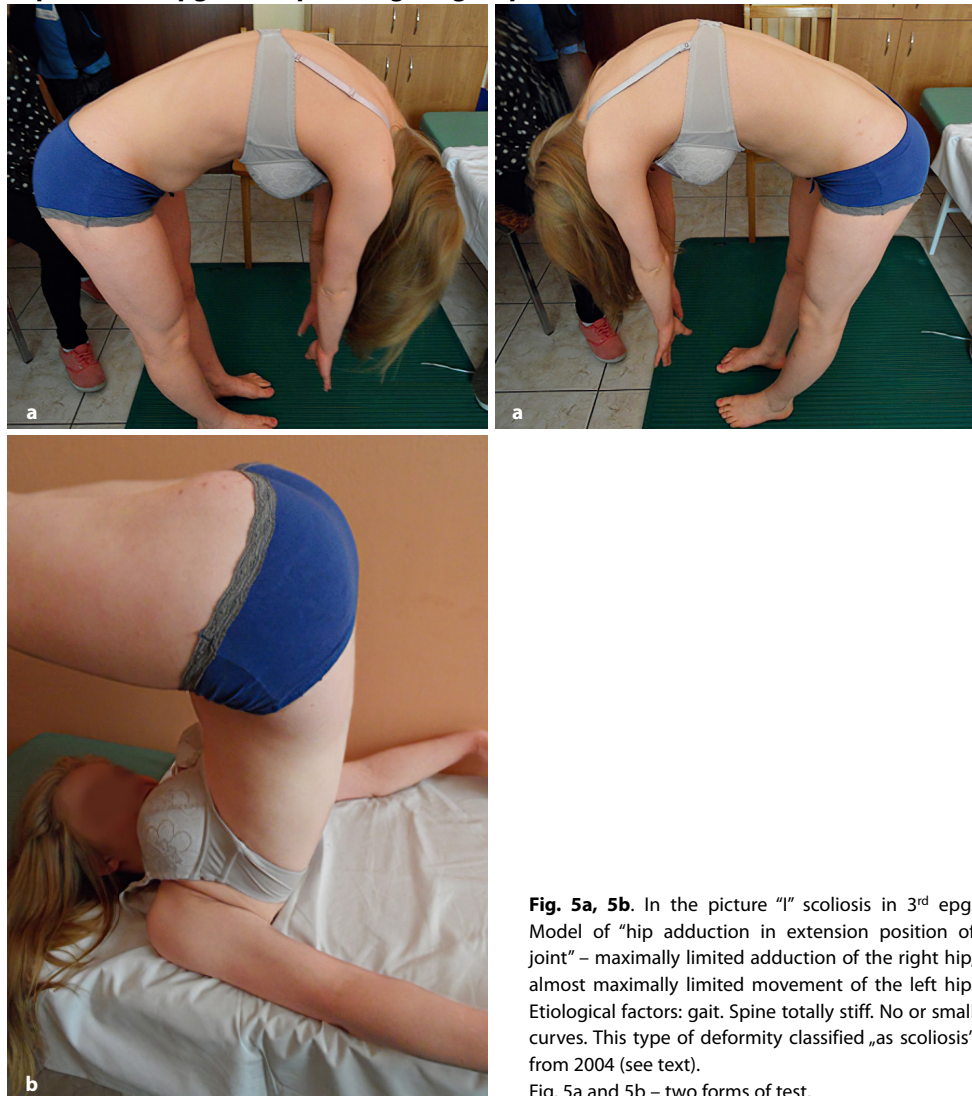


Fig. 5a, 5b. In the picture "I" scoliosis in 3rd epg. Model of "hip adduction in extension position of joint" – maximally limited adduction of the right hip, almost maximally limited movement of the left hip. Etiological factors: gait. Spine totally stiff. No or small curves. This type of deformity classified „as scoliosis” from 2004 (see text).

Fig. 5a and 5b – two forms of test.

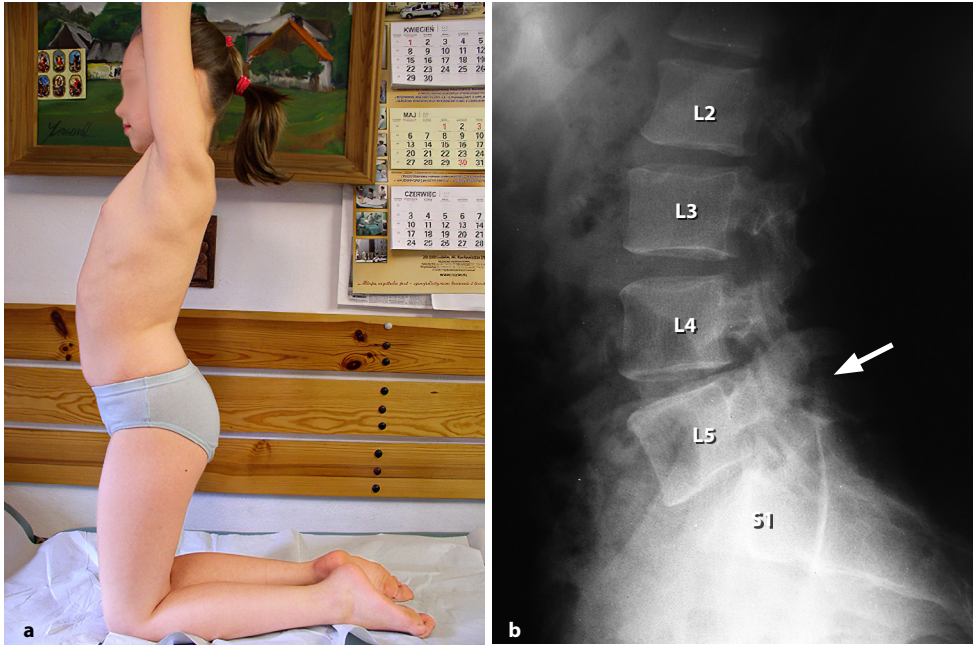


Fig. 6a, 6b. Girl, 13 years old. Anterior tilt of pelvis as a result of flexion contracture of the hips – symptoms of MBD. Sacral bone in horizontal position and hiperlordosis of lumbar spine. If deformity not treated in childhood – back pain in the adult age.

According to obstetricians and gynecologists (Prof. Jan Oleszczuk and Coll. [52, 53, 24–26, 30, 32–38]), the causes of MBD in children are:

- 1) chronic placental inefficiency,
- 2) intrauterine limitations of the foetus growth,
- 3) oligohydramnios,
- 4) spotting,
- 5) uterus contractions during pregnancy,
- 6) excessively intense action of the uterus during delivery as well as uterine tetanus,
- 7) maternal hypertension or hypotension,
- 8) maternal anaemia,
- 9) infection of the urinary tract,
- 10) mellitus during pregnancy,
- 11) stress and noise during pregnancy (example – child with MBD born from a mother musician in Philharmonic Orchestra),
- 12) overdoses or improper medications during delivery,
- 13) twin-to-twin transfusion syndrome (TTTS).

The conditions presented above can lead to CNS asphyxia during pregnancy and / or delivery and are the cause of Minimal Brain Dysfunction (MBD) or even Cerebral Palsy.

MBD results in secondary changes in the Locomotor System [1–8, 35–41].

There are:

- a) laxity of joints – diminished stability of joints and increased development of scoliosis, an important cause of back pain as well.
- b) extension contracture of the trunk's muscles – causes stiffness of spine in "S" scoliosis in 1st epg group/type and in "I" scoliosis in 3rd epg group/type. Here we would like to underline that stiffness of spine is also the cause of "back pain".
- c) anterior tilt of pelvis and hiperlordosis of lumbar spine (**Fig. 6a, 6b**) as result of flexion contracture of hips flexors – diminished stability between pelvis and spine.
- d) shortening (in orthopedic language "contracture") of flexors of knees: m. Semitendinosus, m. Semimembranosus, m. Gracillis, m. Biceps femoris (other description - muscles Hamstrings). Children with this abnormalities are not able to make full flexion to the body, not able to touch the floor by fingers..

Historical dates of discoveries of biomechanical etiology of so-called idiopathic scoliosis and presentation of the problem (Karski T. 1995 – 2007)

1. **1995** – first lecture about biomechanical etiology of the so-called idiopathic scoliosis during Orthopedic Congress in Szeged, Hungary.
2. **1996** – first publication about biomechanical etiology of scoliosis in Orthopädische Praxis in Germany [10]: *T. Karski [1996] Kontrakturen und Wachstumstörungen im Hüft- und Beckenbereich in der Ätiologie der sogenannten „idiopathischen Skoliosen“ – biomechanische Überlegungen, Orthopädische Praxis 32, 3 (1996) 155-160*
3. **2001 and 2004** – describing in new classification three etiopathological groups (epg) and four types of scoliosis: "S" scoliosis in 1st epg, "C" and "S" scoliosis in 2nd epg, "I" scoliosis in 3rd epg. In this last type - the spine is stiff, the curves are small or there are none.
4. **2006** – the ultimate description of the "type of hips movement" and the "type of scoliosis".
5. **2007** – description of indirect influences coming from the Central Nervous System (CNS) in children with Minimal Brain Dysfunction (MBD). The reason why blind children do not have scoliosis was found in the same year: they walk without lifting legs high and therefore there is not any pathological influence acting on the pelvis and spine.
6. **2000–2020** – lectures about the so-called idiopathic scoliosis during Prague – Lublin – Sydney – St. Petersburg Symposia in Prague, Humpolec, Kromeriz, Rhodos, Sarbinowo, St. Petersburg, Krasnohrad, Zwierzyniec, Lublin, Plzen (on Polish – Pilzno, Czech Republic).

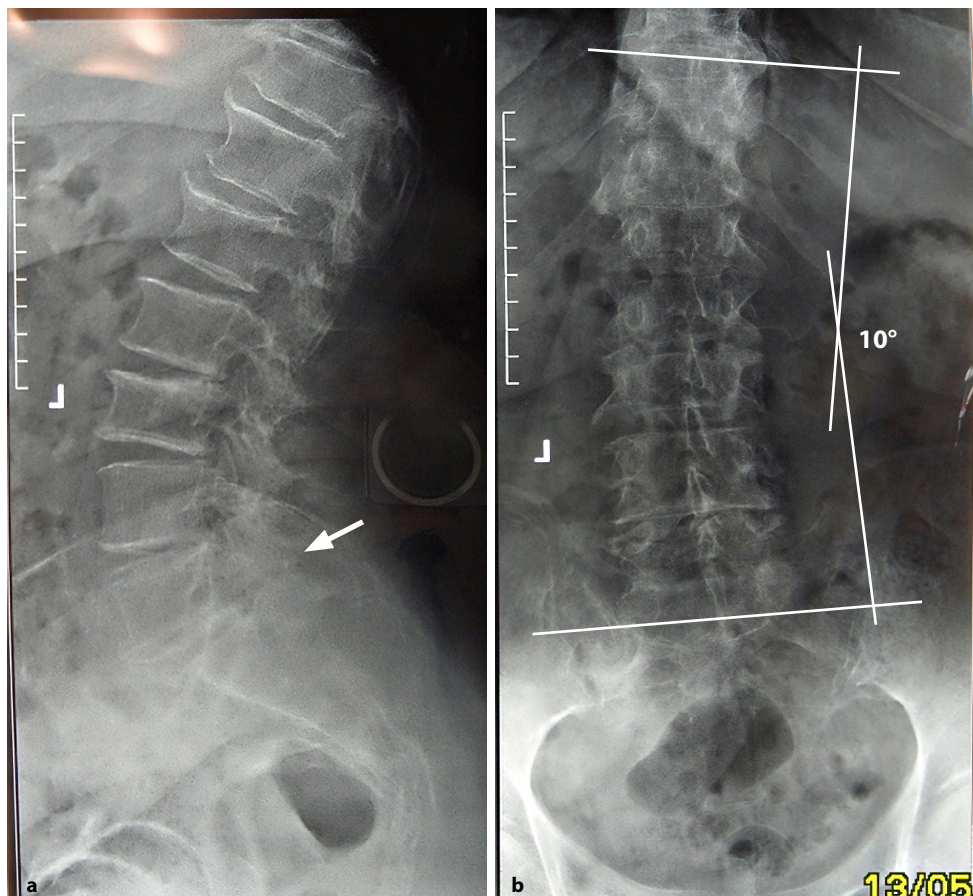


Fig. 7a, 7b. Patient in age 66 years. Example of anterior tilt of pelvis as a result of flexion contracture of the hips. Sacral bone in horizontal position and hiperlordosis of lumbar spine. Scoliosis "C", 2nd/A epg. Deformity not treated in childhood – back pain in the adult age.

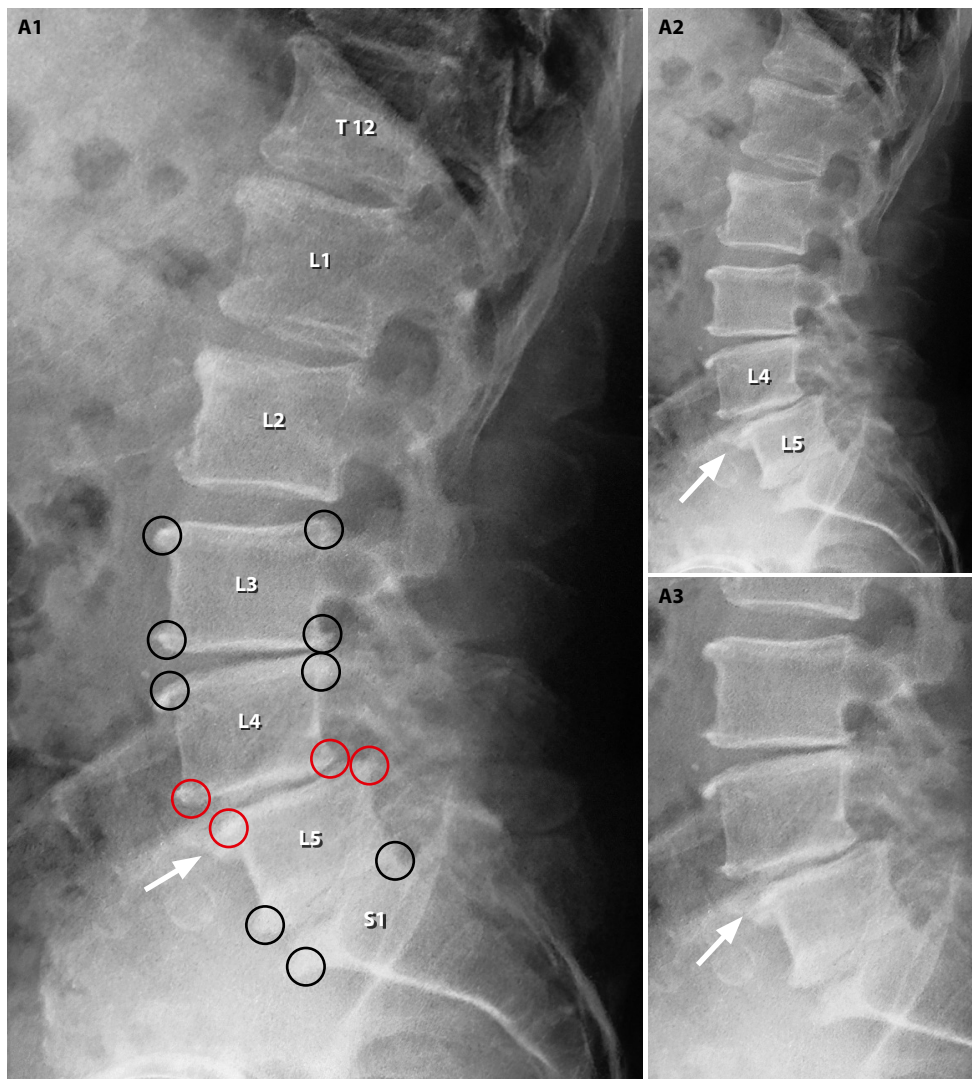


Fig. 8. Patient 50 years old. Spondylolisthesis L4–L5 – see marking points (red circles) and Osteophytes (arrow). Compression of nerve roots. Permanent pain in lumbar region in everyday situations. Annoying pain after hard work. (A2) and (A3) are details of the X-ray picture.

New classification. Three groups and four types of scoliosis (**Fig. 3, 4A1, 4A2, 4B1, 4B2, 5a, 5b**) [10–44, 59].

The type of spine deformity is connected with “model of hips movement” and etiological factors – “gait” and “standing at ease’ on the right leg”.

- 1) Scoliosis 3D – “S” 1st etiopathological group (epg) – double curve. Stiff spine. Rib hump on the right side of the thorax. Specific model of hip movements – maximally limited movement of right hip and full movement of the left hip. Connection with “gait” and permanent “standing at ease’ on the right leg”. Mostly – rapid progression.
- 2a) Scoliosis 1D or 2D – “C” 2nd/A epg – one curve – lumbar left convex. Flexible spine. Specific model of hip movements – minimally limited movement of the right hip and full movement of the left hip. Connected with permanent standing „at ease’ on the right leg. This type of scoliosis is without progression. This type of scoliosis in adults is very frequently the cause of back pain. Why – because standing on the right leg is permanent – and lasts throughout the life (**Fig. 7a, 7b, 8**).
- 2b) Scoliosis 2D or 3D “S” 2nd/B epg – two curves. Specific model of hip movements – minimally limited movement of the right hip and full movement of the left hip. Connection with permanent standing ‘at ease’ on the right leg and additionally with laxity of joints or / and previous, harmful exercises. In the 2nd/A and 2nd/B types of scoliosis – the spine is flexible. In this type of scoliosis, the progression is moderate. In older people standing on the right leg is the cause of degenerative scoliosis and heavy back pain syndrome like type “C” in 2nd epg.
- 3) Scoliosis 2D or 3D – “I” 3rd epg. Specific model of hip movements – maximally limited movement of right hip and maximally or partially limited movement of the left hip. Deformity has the form of a stiff spine. No curves or small ones. The only cause is gait. Clinical symptoms are “stiffness of the spine in children” and “pain syndromes in adults” (**Fig. 9, 10**). Stiffness, like in the 1st type of scoliosis, is connected with “distortion movement” of intervertebral joints of the spine in every step during walking.

Therapy of scoliosis (A) and low back pain (B) (Fig. 11). (A) In scoliosis therapy, stretching exercises for hips play the essential role – especially for the right hip and for spine. In the therapy it is important to cure the “contracture” – shortenings of soft tissues – muscles, fascias, tendons, capsules of the joints. The aim of such therapy is – obtaining full movement of hips and spine. Full and symmetrical movement of hips and spine is necessary for a proper development of spine. Exercises like in karate, taekwondo, aikido, kung fu or yoga are especially beneficial. In Poland such exercises in the treatment of scoliosis were introduced first by Prof. Stefan Malawski from Warsaw / Otwock (1960 – 1970) (31 – 33, personal discussions).

(B) For patients with back pain we advise taking adequate measures according job, paying extra attention at work and resting and sleeping in a proper position - in every case - in embryo position.



Fig. 9. Alicja 22 years old. "S" scoliosis in 1st epg in new classification. Left convex lumbar and right convex thoracic curve – as result of wrong previous exercises. Stiffness of the lumbar and thoracic spine. Pain during physical effort.

In serious cases we recommend the chair extension (**Fig. 12**) to relieve the neuro-roots. In pain free period of illness we recommend exercises in warm water – the best - in geothermal water. In serious cases, longer rest in bed and adequate analgesics. It is important to avoid standing on the right leg by all neurological patients. In many cases standing on the left leg or in a special "therapeutical position" is very beneficial and relieves the pain (**Fig. 13a, 13b, 13c, 13d**). Only rare cases require surgery.

Causal prophylaxis and treatment of scoliosis in children and back pain in adults in points:

- 1) Standing 'at ease' only on the left leg since the first years of life,
- 2) Sitting in a "butterfly position" (term from karate) and with relaxed spine – never straight up. Such sitting position is very beneficial for hips development of babies and older children,
- 3) Resting and sleeping in the embryo position – protects from scoliosis in children and from back pain in adults,

- 4) Children – active participation in sports at school and additionally in clubs - the best are karate, kung fu, taekwondo, aikido; yoga is advised for adults,
- 5) Adults – physiotherapy and Kinesio-therapy to obtain full, symmetrical movement of both hips and movements of the spine – flexion, deviation, rotation,
- 6) In the first stage of therapy and in prophylaxis of scoliosis the intention is to recover full adduction and internal rotation movement of the right hip. It is the new aim for physiotherapy,
- 7) For adult patients exercises in geothermal water are very important, “chair extension” and resting in the case of severe pain.
- 8) Adult patients should – change profession if it is harmful for the spine.
- 9) Our recommendation concerning physiotherapy for adults suffering from spine pain – massage, cryotherapy, diadynamic, iontophoresis and other forms of physical therapy.
- 10) In especially difficult cases of low back pain – surgery if long lasting physiotherapy is without result.



Fig. 10. Anna 25 years old. „S” scoliosis in 1st epg in new classification. Left convex lumbar and small right convex thoracic curve. Stiffness of the spine. Occasionally pain.



Fig. 11. Stretching exercises – proper therapy for scoliosis. The best are karate, aikido, kung fu, yoga. Aim of therapy – to obtain the symmetry of movement of hips, position of pelvis and full movement of spine. In result in all patients – proper growth & development of the spine and whole body.



Fig. 12. Patient 53 y. old. Anterior tilt of pelvis. Scoliosis "C" 2/A epg. Spondylolisthesis L5-S1. Pain with radiation to the left leg.

Treatment: Chair extension for the spine. The methods of therapy author (T. Karski) learned in Germany in 1968 in Orthopedic Department in Leipzig.



Fig. 13a, 13b, 13c, 13d. Proper therapy for hips and spine pain syndromes. (A) (B) (C) – prophylactic and therapeutically standing, sitting and sleeping. In position (D) – therapy against spine pain – important during resting and sleeping. A – standing | B – sitting | sleeping position: for hips – C, for spine D

DISCUSSION

In our opinion the back pain syndromes occur in the following cases:

1. hiperlordosis of lumbar spine,
2. "C" and "S" 2nd/A/B scoliosis group in the new classification,
3. stiffness of spine – scoliosis "I" in 3rd group in the new classification,
4. spondylolisthesis.

Here I would like to explain that the cause of pain is situated in two – three – four places in the spine and surgery in such situation is not a proper method of therapy. I repeat – doctors in Poland most often diagnose the "prolapsed nucleus pulpous" and suggest surgery. Here I would like to explain – many years ago – during my scholarship DAAD stay in Orthopedic Department in Essen, Germany, 1973 – and next during Congresses in Hungary I had an occasion to discuss "back pain problems" with Professor K. F. Schlegel – head of the Essen's Orthopedic Department. Professor Schlegel told me that longstanding studies of "the spine pain syndromes" in Germany have shown that surgery was never the best solution for such group of patients.

The pain is concentrated on more levels of the spine and surgery cannot cure the spine pain as a whole. In our praxis we have observed – that only physiotherapy is good in many patients – see **Table 1**. In group of 874 patients with back pain we received excellent results of physiotherapy in 20%, good in 30%, and sufficient in 50%. Only very small group 1% – 3% of patients we had sent to surgery.

CONCLUSIONS

- 1/ There are three groups and four types of the so-called idiopathic scoliosis (see chapter about classification).
- 2/ The etiology of the so-called idiopathic scoliosis is strictly biomechanical – standing on the right leg and gait.
- 3/ The back pain syndromes are mostly connected with the pathological changes in the anatomy of the spine and its function.

Results	Excellent	Good	Sufficient
	± 20%	± 30%	± 50%
	many years without pain	many months without pain	occasionally pain after stress

Table 1: Back pain syndromes in patients with scoliosis or lumbar hyperlordosis or spondylolisthesis. Total number of treated youth and adults patients.

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- 4/ The main causes of back pain are (from very frequent to rare):
 - a/ hiperlordosis of lumbar spine,
 - b/ the "C" and "S" scoliosis in 2nd / A / B epg types,
 - c/ stiffness of spine in "I" 3rd epg type of scoliosis,
 - d/ spondylolysis or spondylolisthesis,
 - e/ congenital anomalies of spine or thorax with influence to spine,
 - f/ spine anomalies / disorders in various "Congenital Syndromes" like Osteogenesis Imperfecta, Morquio Syndrome, Marfan Syndrome, Ehlers – Danlos Syndrome, Asphyxiating thoracic dystrophy without respiratory disease (Italian: Distrofia thoracica asfissiante senza compromissione respiratoria) – publication in Italy – under the direction of Prof. K. Kozłowski [9], others.
 - 5/ In prophylaxis of back pain in adults it is important to introduce to all children the rules of causal prophylaxis program against scoliosis (see chapter above).
 - 6/ In therapy of back pain – crucial recommendations are:
 - a/ avoiding standing 'at ease' on the right leg,
 - b/ resting and sleeping in embryo position,
 - c/ in extreme/severe cases "chair extension" and in the "pain-free phase of the illness" - exercises in geothermal water.
 - 7/ Surgery in back pain syndromes is necessary only in rare cases resistant to conservative treatment.

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Authors address:

Professor Tomasz Karski MD PhD:

Retired Head (1995–2009) of the Paediatric Orthopaedic and

Rehabilitation Department of Medical University in Lublin, Poland.

Actually Professor Lecturer in Vincent Pol University in Lublin, Poland.

Lecturer in ERASMUS Program in Belgium, in Germany, in Spain, in Italy (2013–2017).

tmkarski@gmail.com, t.karski@neostrada.pl, www.ortopedia.karski.lublin.pl