

“Minimal Brain Dysfunction” (MBD) Influence on the Development of the Feet, Knees, Hips, Pelvis and Spine, Causes, Clinic, Therapy

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ABSTRACT

In pathology of locomotor system, there are many causes but Minimal Brain Dysfunction (MBD) appears very frequently [1-3,6,7,20,24,25,31]. Between patients examined in years 1995 – 2023 this group counted 18 % – 20 % of cases. Mostly children with deformities of feet, knees, hips, pelvis and spine. Important is early therapy - than will be received “healthy status” of movement apparatus in adults.

Keywords

Minimal Brain Dysfunction. Deformity of feet, Knees, Hips, Pelvis, Spine.

Introduction

In the article, we present one of the very common forms of pathology in the locomotor system observed in child’s period of life [1-31]. The health of adult persons very often depends on effective prophylaxis and proper therapy of the various disorders in childhood.

The First Group of Pathology

Prof. Hans Mau described “The Seven Contractures Syndrome” (German *Siebenersyndrom*). In this syndrome, there are some asymmetries of the “body build” and asymmetries in range of movement of joints. In Lublin (T. Karski & J. Karski) for this pathology we use - the term “Syndrome of Contractures and Deformities” [SofCD] – because in 2006 we add the eighth deformity – varus deformity of the shanks to this syndrome. The pathology of SofCD is presented in another of our articles [4,5,8-19,21-24,26-29,31].

The Second Group of Pathology (Figure 1-10)

Minimal Brain Dysfunction (MBD) also has influence on status of health in children and youth - and if not properly treated - also in adults. MBD is the subject of this paper [4-24].

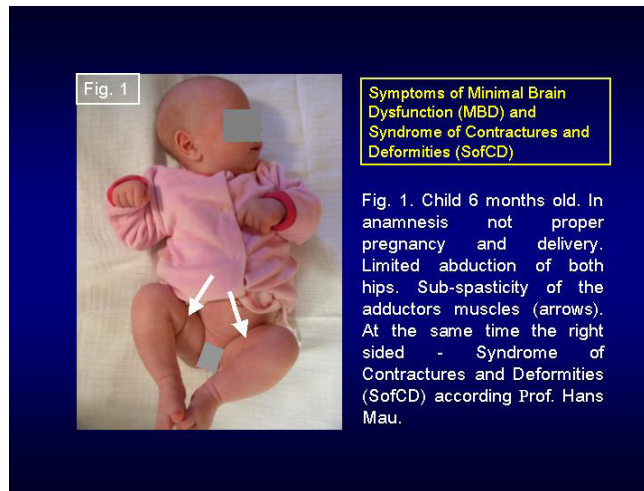
Of course there are other “causes and forms of pathology” in children like congenital, post inflammation disorders, post injuries and others. However, in this article our focus is on the MBD disorder – and its influence to the hips, shanks, knees, to pelvis and spine.

Minimal Brain Dysfunctions (MBD). Clinic. Causes and Epidemiology (Figure 1–10)

MBD – means some – not fully healthy status of “of the brain function” – changed by asphyxia in pregnancy or delivery period, seldom by illnesses in the postnatal children’s life. In the MBD there are sub-spasticity of various groups of muscles - mostly flexors of the hips, flexors of the knees, flexors of the feet. We also observed the psychological changes of many patients (T. Karski – two publications in USA, Kansas).

According to obstetrics and gynecologists (Prof. Jan Oleszczuk and coauthors), the causes of MBD [22,23,28-31] in children are because of some abnormalities of gravidity period:

- (1) Chronic inefficiency of placenta
- (2) Intrauterine limitations of fetus growth
- (3) Oligohydramnios
- (4) Spotting
- (5) Uterus contractions during pregnancy
- (6) Excessively intense action of uterus during delivery as well as uterine tetanus
- (7) Hypertension



Symptoms of Minimal Brain Dysfunction (MBD) and Syndrome of Contractures and Deformities (SofCD)

Fig. 1. Child 6 months old. In anamnesis not proper pregnancy and delivery. Limited abduction of both hips. Sub-spasticity of the adductors muscles (arrows). At the same time the right sided - Syndrome of Contractures and Deformities (SofCD) according Prof. Hans Mau.

Figure 1: Symptoms of Minimal Brain Dysfunction (MBD) and Syndrome of Contractures and Deformities (SofCD). Child 6 months old. In anamnesis not proper pregnancy and delivery. Limited abduction of both hips. Sub-spasticity of the adductors muscles (arrows). At the same time the right sided - Syndrome of Contractures and Deformities (SofCD) according Prof. Hans Mau.

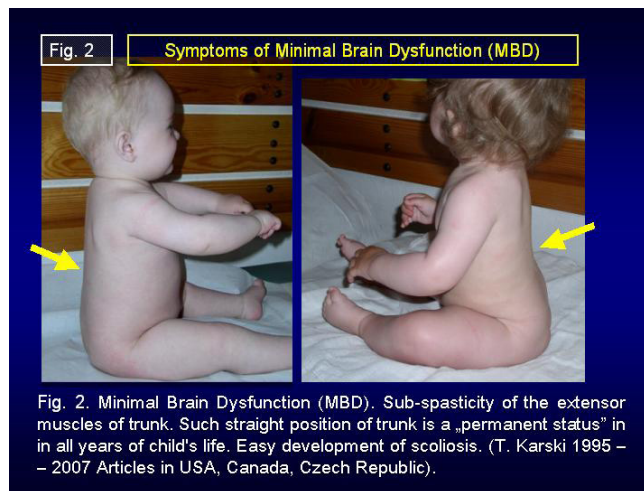


Fig. 2

Symptoms of Minimal Brain Dysfunction (MBD)



Fig. 2. Minimal Brain Dysfunction (MBD). Sub-spasticity of the extensor muscles of trunk. Such straight position of trunk is a „permanent status” in in all years of child's life. Easy development of scoliosis. (T. Karski 1995 – 2007 Articles in USA, Canada, Czech Republic).

Figure 2: Minimal Brain Dysfunction (MBD). Sub-spasticity of the extensor muscles of trunk. Such straight position of trunk is a „permanent status” in in all years of child's life. Easy development of scoliosis. (T. Karski 1995 – 2007 Articles in USA, Canada, Czech Republic).

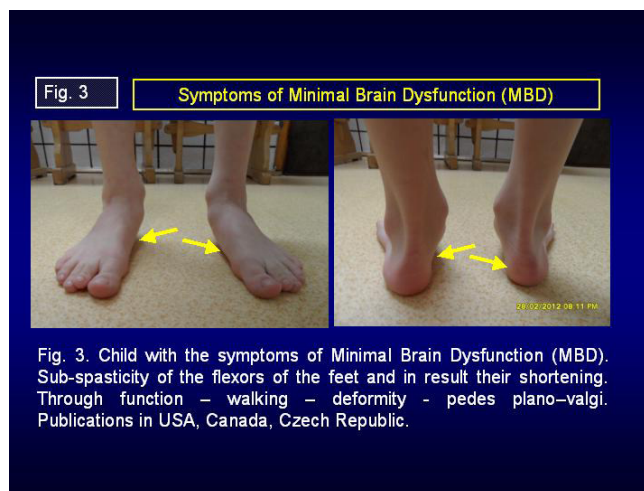


Fig. 3

Symptoms of Minimal Brain Dysfunction (MBD)



Fig. 3. Child with the symptoms of Minimal Brain Dysfunction (MBD). Sub-spasticity of the flexors of the feet and in result their shortening. Through function – walking – deformity - pedes plano-valgi. Publications in USA, Canada, Czech Republic.

Figure 3: Child with the symptoms of Minimal Brain Dysfunction (MBD). Sub-spasticity of the flexors of the feet and in result their shortening. Through function – walking – deformity - pedes plano-valgi. Publications in USA, Canada, Czech Republic.

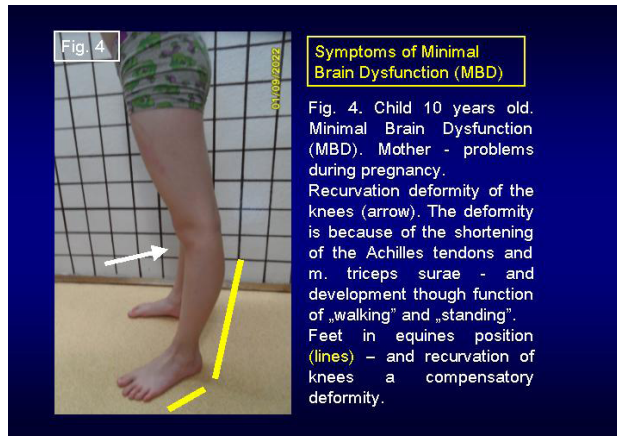


Figure 4: Child 10 years old. Minimal Brain Dysfunction (MBD). Mother - problems during pregnancy. Recurvation deformity of the knees (arrow). The deformity is because of the shortening of the Achilles tendons and m. triceps surae - and development through function of „walking” and „standing”. Feet in equine position (lines) – and recurvation of knees a compensatory deformity.

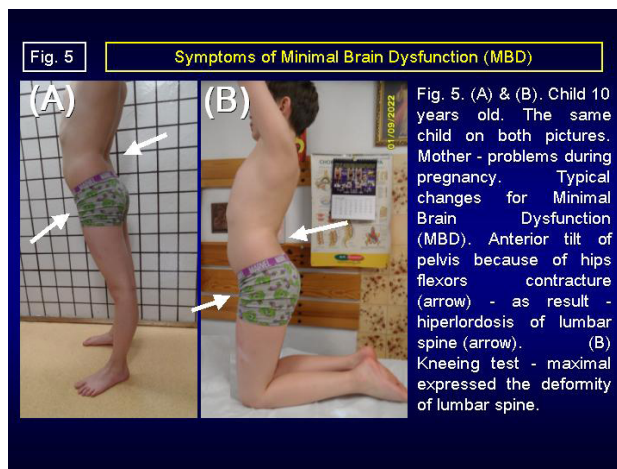


Figure 5: (A) & (B). Child 10 years old. The same child on both pictures. Mother - problems during pregnancy. Typical changes for Minimal Brain Dysfunction (MBD). Anterior tilt of pelvis because of hips flexors contracture (arrow) - as result - hiperlordosis of lumbar spine (arrow). (B) Kneeing test - maximal expressed the deformity of lumbar spine.

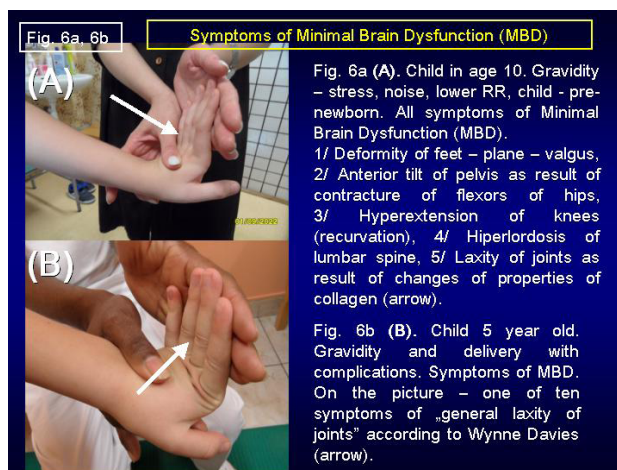


Figure 6a (A): Child in age 10. Gravity – stress, noise, lower RR, child - pre-newborn. All symptoms of Minimal Brain Dysfunction (MBD). 1/ Deformity of feet – plane – valgus, 2/ Anterior tilt of pelvis as result of contracture of flexors of hips, 3/ Hyperextension of knees (recurvation), 4/ Hiperlordosis of lumbar spine, 5/ Laxity of joints as result of changes of properties of collagen (arrow).
Figure 6b (B): Child 5 year old. Gravity and delivery with complications. Symptoms of MBD. On the picture – one of ten symptoms of „general laxity of joints” according to Wynne Davies (arrow).

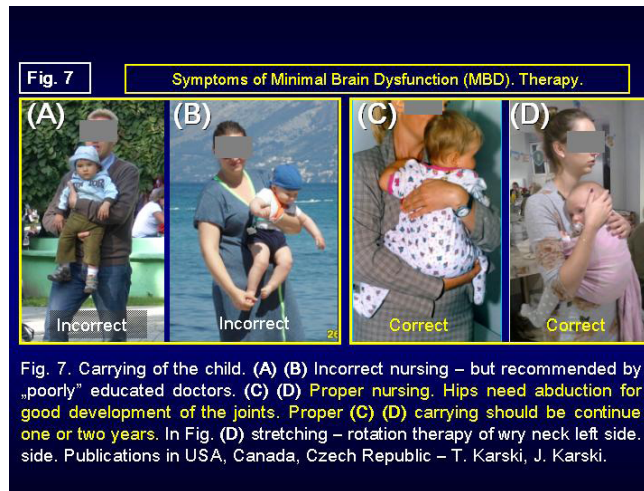


Figure 7: Carrying of the child. (A) (B) Incorrect nursing – but recommended by „poorly” educated doctors. (C) (D) Proper nursing. Hips need abduction for good development of the joints. Proper (C) (D) carrying should be continue one or two years. In Fig. (D) stretching – rotation therapy of wry neck left side. Publications in USA, Canada, Czech Republic – T. Karski, J. Karski.



Figure 8: Child 10 years old. The same like on Fig. 4, 5. Minimal Brain Dysfunction (MBD). Stretching exercises for lengthening of flexors of knees and feet (arrow). Aim - proper anatomy and function of the feet.

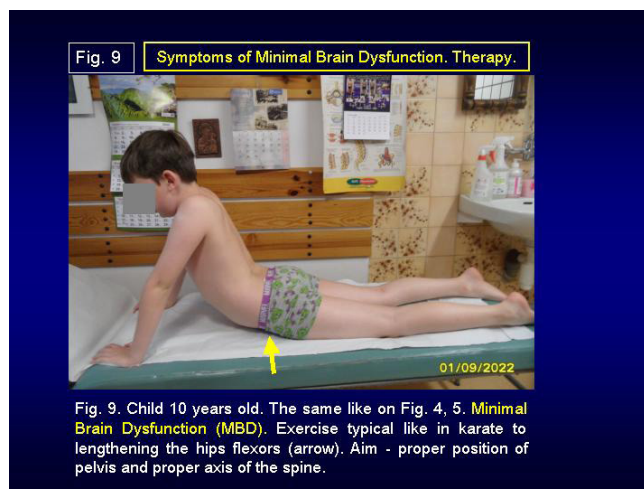


Figure 9: Child 10 years old. The same like on Fig. 4, 5. Minimal Brain Dysfunction (MBD). Exercise typical like in karate to lengthening the hips flexors (arrow). Aim - proper position of pelvis and proper axis of the spine.

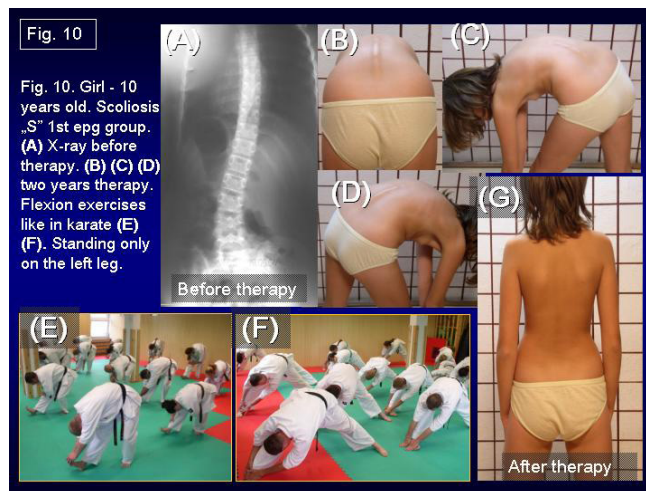


Figure 10: Girl - 10 years old. Scoliosis „S” 1st epg group. (A) X-ray before therapy. (B) (C) (D) two years therapy. Flexion exercises like in karate (E) (F). Standing only on the left leg

- (8) Hypotension
- (9) Anemia
- (10) Infection of urinary tract
- (11) Difficult delivery
- (12) Using of „forces” during delivery
- (13) Stress and noise
- (14) Overdoses or improper medication during delivery
- (15) Twin Twin Transfusion Syndrome
- (16) Mellitus at newborns – bigger than normal - first communication – Prof. Harald Thom from Heidelberg (T. Karski - DAAD stay in Heidelberg & Essen, 1972 – 1973)

Here we would like to explained – that “laxity of joints” is not caused by “low tension of the muscles”, but - because of “the changed in their properties of collagen”.

Presentation of disorders connected with MBD (Figures 1-10)

Hip dysplasia (Figure 1)

Hip dysplasia appears in three pathological conditions [13-17,30,31].

- A. In Syndrome of Contractures and Deformities (SofCD) - H. Mau, T. Karski & J. Karski - 90 % hip dysplasia cases in Poland.
- B. In the situation of general laxity of the joints - 5 % of all dysplasia cases in Poland - laxity is a symptom of MBD. First communication was presented by Prof. Tibor Vizkelety, Hungary in `1960 – 1970.
- C. In children with MBD – because of spasticity or sub-spasticity of adductor muscle of hips - 5 % of all dysplasia cases in Poland.

Special Influence of MBD in Development of the Scoliosis [11-23].

Minimal Brain Dysfunction (MBD) make influence not only in development feet, knees, anterior tilt of pelvis and hyperlordosis lf lumbar spine (Figures 2,5,6), but also in development of the

so-called idiopathic scoliosis. Many of authors had seen this neurological influences as primary and exclusive cause of scoliosis. For example Prof. M. Roth from Czech Republic in 1923 had described these causes as „neuro-osseous-growth-relations” – as primary and principally causes of scoliosis. Our explanation about connections of MBD and development of scoliosis is - that MBD play only a secondary role:

- A:** In MBD it is extension contracture of spine – in two groups of so-called idiopathic scoliosis the spine is rigid in extension position,
- B:** It is anterior tilt of pelvis – cause lesser stability in complex “pelvis and spine”,
- C:** Exist laxity of joints – easy development of spine curves.

All these three abnormalities – make easy development various disorders in movement apparatus and also make easy development of the so-called idiopathic scoliosis, but I would like to express – MBD is not the primary and principal cause of the so-called idiopathic scoliosis.

Valgus or Plane-valgus Deformity of the Feet [1-7,13-15,20-25,31] (Figure 3)

The cause of feet valgus deformities is the shortening (contracture) of the Achilles tendon, of m. triceps surae and other muscles of the feet because of spasticity or semi-spasticity. As first – in 1960 - 1970 – described this “connection” Prof. Jean Meary from Paris, France.

Recurvation and Valgus Deformity of the Knees (Figure 4)

A/ Recurvation, other description “hyperextension” of the knees is very often accompanied symptoms of valgus deformity of the feet. This deformity of the knees is also the effect of a shortening of the Achilles tendon and m. triceps surae. Hyperextension of the knees is the compensatory deformation.

Explanation:

- A. Persist limitation of the dorsal flexion of the feet because of shortening of m. triceps surae and Achilles.
- B. During walking, at the moment when the foot is in full contact with the floor, must appears hyperextension of the knees as compensatory deformity.
- C. Valgus deformity of knees is mostly connected with improper sitting, and it is very common in children with “laxity of joints”. Such sitting is with the legs on side, what is described in medical literature as “TV sitting” or in German language “Najaden Sitz”. Valgus of knees can be also result of spastic or sub-spastic contracture of m. tensor fasciae latae.

Anterior Tilt of the Pelvis and Hiperlordosis of the Lumbar Spine [4-24] (Figure 5).

In children with Minimal Brain Dysfunction (MBD) independent of valgus deformity of the feet and recurvation of the knees very often we observe anterior tilt of the pelvis with hiperlordosis of the lumbar spine. This pathology is cause by shortening – it’s mean – contracture - of flexors of hips – mostly shortening of m. rectus. This deformity has a big influence in development of the so-called idiopathic scoliosis at children. In adults is the cause of “back pains syndromes” and it is because of “anterior tilt of pelvis” and next “hyperlordosis of lumbar spine”. Anterior tilt of pelvis diminish the stability in complex – “pelvis – sacral bone – lumbar spine” – and make easy development and progression of scoliosis. First observation about this influence were given by Prof. Donat Tylman and Prof. Kazimierz Rapala from Warsaw in years 1960 – 1970.

Therapy of MBD (Figures 7-10).

All strengthening exercises to “receive strong muscles” are incorrect. Unfortunately, there are recommended in many countries and in Poland. Only restoring of full movement of joints and correct position of particularly parts of body are correct therapy. Only stretching exercises are proper and suitable in therapy of various pathologies.

For Therapy of Dysplasia of Hips

Overcoming of spasticity of adductor muscles – by abduction nursing (Figure 7), abduction devices, walking after one years – if in Sonography or in radiology examination the hips are fully proper.

For wry neck

Only stretching rotation therapy of m. sterno-cleido-mastoideus is proper and should be introduced just in babies (Figure 7 / D). Older children need longer time of such treatment.

For varus of shanks

“Absolutely – ‘no walking’ and no ‘standing’” two or three months give spontaneously proper axis of legs. This therapy is sufficient for children in age 1 – 2.5 years.

In one curve scoliosis

Proper are bending exercises - forwards and to convex side of deformity – to lengthened soft tissue in concave side of spine. In

two-curve scoliosis - bending exercises forwards and to left and right side, permanently, every day – so long as the axis is proper. In one curve scoliosis - bending exercises forwards and to left side, permanently, every day – so long as the axis is proper. Every treated patient should remember – not to stand ‘at ease’ on the right leg. Early – proper therapy of scoliosis – is very important – and can be seen - as prophylaxis of “back pain syndromes at adults”. In the therapy are very profitable the sport arts like karate, taekwondo, aikido and yoga (Figure 10).

Summarized prophylactic recommendations against so-called idiopathic scoliosis in points [4-24]:

- a) Healthy children – standing ‘at ease’ the same time on right, left, both legs.
- b) Endangered by scoliosis children - standing ‘at ease’ only on the left leg.
- c) Older people should stand in “corrective position” – in abduction of hips 30 degree and in internal rotation 10 degree.
- d) Sitting relax, never straight up.
- e) Sleeping in embryo position.
- f) Active participation in sport. The best are karate, kung fu, taekwondo, aikido, yoga.
- g) These forms of exercises should be introduced in kindergartens and in primary school.

Discussion

Among various causes of pathology of locomotor system – two groups are presented very frequently. The first group of pathology is “Syndrome of Contracture and Deformities” (SofCD) according to Prof. Hans Mau. If SofCD is not treated, can lead to problems at adults persons.

The second is “Minimal Brain Dysfunctions” (MBD) – leading to wrong position of parts of the body, to limitation of joints movement and is the cause of general laxity because of changed properties of collagen. In ours material – in more than 2000 examined children and youths it was 20 % of patients with MBD symptoms.

There are in orthopedic pathology – also other etiological influences – but this both mentioned above are very frequent.

Conclusions

1. Minimal Brain Dysfunction (MBD) – appears in specific pathological situations of pregnancy or / and delivery. More rare can be result of neurological illnesses of the child.
2. Etiological causes of MBD are all pathological situations leading to asphyxia of the brain of a fetus during pregnancy or delivery.
3. MBD is the cause of limitation of some, particular movements of joints – and in results is the cause of pathology of feet, knees, pelvis and spine.
4. The best methods in therapy of MBD - are stretching exercises to lengthen the shortened muscles, tendons and capsules.

5. In the therapy of hips dysplasia – it is important proper nursing of newborns and babies – in full abduction of hips. To stand and to walk – we should allowed if clinically and in Sonography or in radiological examination the hips joints are proper developed.
6. In therapy of the So-called Idiopathic Scoliosis it is important - standing ‘at ease’ only on the left leg and flexions – stretching exercise for spine in all directions.
7. Such sport arts like karate, taekwondo, aikido, kung fu or yoga have very important value in therapy of feet, knees, position of pelvis and of spine.

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