

Minimal Brain Dysfunction. Children and adults. Clinical and Psychological Symptoms. Examples of pathology. Rules of Therapy

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Abstract

In the paper there are presented observations from the years 1995-2021. Material content of 1355 children and youths in the ages between 2 and 18 years and adults 20-70 years old. In the article they are present the clinical symptoms of Minimal Brain Dysfunction [MBD]. Clinically there are: valgus deformity of the feet, hyperextension of the knees, anterior tilt of the pelvis, hyperlordosis of the lumbar spine. These symptoms are as result of spasticity or sub-spasticity of the muscles. At the same time, we observe in this group of patients "laxity of joints" and this is a result of the changes in the properties of collagen. In the MBD group of patients-there are very often also psychological disorders-similarly like in cases of Attention Deficit & Hyperactivity Disorder (ADHD). Children with MBD often present inclination to hyperactivity-frequent jumping-and it is the main cause of Perthes disease. There are also psychological changes in behavior in adults-and this is described in "Discussion". It is also given information about physiotherapy of the diseases and disorders in movement system.

Keywords: Deformations, Illnesses, Orthopedics, Neurology, Psychological Problems, Examples of Pathology in Locomotors System, Therapy.

Introduction

From the beginning of humanity-there were illnesses, deformations and people suffered. In ancient time there were two kinds of „doctors“-medicus (Latin) and cyrulik (Polish) / barber-later surgeon. From 1741-after publication in French of the book under the title: *L'Orthopédie ou l'art de prévenir et de corriger dans les enfants, les difformités du corps le tout par des moyens à la porté des pères & des mères & de toutes les personnes qui ont des enfants à élever* (1741)-author Dr Andry Nicolas, the French-Kings doctor - the word "orthopedics" is known. This word is coming from the Greek language-orthos-strait, correct and pais-child.

In medicine appear often the question-why there are deformations, insufficiency of motor system in children and adults. In the paper I / me discuss the misconception of many Polish rehabilitation doctors claimed about "low tension of the muscles" as the cause of illnesses and deformations and the necessity to "strengthen the muscles through exercises", necessity to form "a special master of brain to influence proper the muscle function". Our point of view is - in first point totally different and we present it in the chapter "Discussion", in the second ours remarks are the same or similarly but through "stimulation of the brain" we should expected "positive psychological influences", but less or no influences to action

of muscles.

Causes of Pathology in Locomotors System-Obstetrics and Orthopedics Observations [1-25].

Almost 13 % of the population of children and youth in Poland-probably is similarly in other countries - in the last 30 years are the children born with various changes in the central nerve system (CNS), influenced development and function of movement apparatus. This happened because pregnancy and delivery in many cases in our time is / are not correct.

According to obstetrics and gynecologists, also based on orthopedics observations - the causes of Minimal Brain Dysfunction (MBD) in children are because of:

1. Hypertension or hypotension of blood circulation in gravidity period of mother,
2. Anemia in gravidity period,
3. Infection of urinary tract,
4. Permanent stress and noise (example - gravidity women as musician in Philharmonic Orchestra, child with MBD),
5. Chronic inefficiency of placenta,
6. Intrauterine limitations of fetus growth,
7. Oligohydrannios (limited intrauterine water), Spotting or

- hemorrhage,
8. Uterus contractions in early stages of pregnancy (in the time before delivery),
 9. Excessively intense action of uterus during delivery as well as uterine tetanus,
 10. Overdoses or improper medication during delivery,
 11. Improper “hand maneuver” of doctor during delivery,
 12. Mellitus of the newborn - frequent and important cause of MBD or Cerebral Palsy described by Prof. Harald Thom (Heidelberg, Rummelsberg, Nürnberg - my cooperation with Professor Thom-in my scholarship time of DAAD - in Heidelberg [1972-1973]).

The status of such cases / patients in situation of asphyxia give / make a specially influence to the central nerve system. So, the time of pregnancy or / and delivery is very important for child-and if was asphyxia - we diagnose the pathology called Minimal Brain Dysfunction (MBD) and in very serious cases Cerebral Palsy. In case of MBD - after years - we observe secondary changes in the locomotors systems also at / in older people.

Material [2-22].

The observations are based on the material of 1355 children and youths in age of 2 to 18 years and adults 20-70 years from the years 1995-2021. These patients were treated in Pediatric Orthopedic and Rehabilitation Department of Medical University in Lublin in 1995-2009 (in this time Professor T. Karski was the Head of this Department) and in Out-Patients Clinic in the years 2009 - 2021.

Orthopedic Observations in Newborns, Babies and Children. Clinical Symptoms of Minimal Brain Dysfunction.

Feet - valgus or plane valgus deformity [5, 6, 10, 15, 16, 18 – 21] (Figure 1).

According to the author’s observations - the main cause of feet valgus deformities is the shortening (contracture) of the Achilles tendon, of m. triceps surae and other flexors of the feet because of spastic or semi-spastic contracture of m. triceps surae as result of Minimal Brain Dysfunctions (MBD). When there is only a shortening of the Achilles tendon and m. triceps surae the child is walking on the equines position of the foot or feet. If on the same time exist “laxity of joints” appears and develop valgus deformity of the feet. Such deformity of feet appears among Polish children in 12% - 15 % of population.



Fig. 1. Child 8 years old. Typical planus – valgus deformity of feet. In examination – shorted Achilles tendons and m. triceps surae, maximal laxity of joints. Walking from 15 month of age, primary on toes, next of whole surface of feet but in prone position. After years fixed valgus and planes deformity.

Figure 1: Child 8 years old. Typical planus – valgus deformity

of feet. In examination – shorted Achilles tendons and m. triceps surae, maximal laxity of joints. Walking from 15 month of age. primary on toes, next of whole surface of feet but in prone position. After years fixed valgus and planes deformity.

It Is Following Explanation in Points of The Development of The Feet Valgus Deformity

1. During walking we need by every step dorsal flexion of feet 15 or 20 degrees,
2. In situation of the shortening of Achilles tendon and m. triceps surae and accompanying laxity of joints, the needed dorsal flexion is made in “prone position of the feet”,
3. Repeated “dorsal flexion in prone position”, after time give the “full fixed valgus, or plane - valgus deformity of the feet.

Totally-the same explanation of “valgus feet deformities” I could find in 60-70 years of XX century described by Prof. Jean Meary from Paris, France.

Therapy

the deformity of feet needs early physiotherapy. I recommend the stretching exercises to lengthen m. triceps surae and Achilles’ tendons-by small children made by parents, next by physiotherapists. Inserts for shoes is also part of the therapy. No treated valgus deformity of feet in child’s period of life, makes big problem in adults-pain, difficulties in walking, limping.

Recurvation Of the Knees-Typical and Frequent Symptoms of MBD [10, 11, 14, 16, 19, 20]

Hyperextension of the knees (Figure 2) are very often accompanied symptoms in 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. Recurvation of knees is the compensatory deformation.



Fig. 2. Child 4 years old. Mother - problems during pregnancy and delivery. Typical changes for Minimal Brain Dysfunction (MBD). Recurvation deformity of the knees. The deformity is because of the shortening of the Achilles tendons and m. triceps surae on both sides and development though function „walking”.

Explanation

Limitation of the dorsal flexion of the feet is because of shortened

m. triceps surae and Achille's tendon, and fixed and the knee receive the status "genu recurvatum (Latin) - recurvation deformity".

Therapy

such deformity needs early stretching exercises like by feet valgus deformities. Additionally, the child should sit in "butterfly" position (description from karate).

Hip Dysplasia [9-16] (Figure 3)

This pathology appears because of three specific conditions:

1. Can be in "Syndrome of Contractures and Deformities" (Sof-CD - H. Mau, T. Karski & J. Karski) in 85 % - 90 % of all cases in Poland. In clinical examination it is limited abduction of the hip. The dysplasia develops slowly and in sonography examination can be "overlooked". Prof. B. Klisic from Beograd called this type of hip disorder as Development Dysplasia of the Hip (DDH).
2. Dysplasia of the hips can be in the situation of general laxity of the joints in 10 % - 15 % of all dysplasia cases in Poland and is connected with MBD (opinion also of Professor T. Vizkelety-Hungary).
3. Dysplasia can develop also in situation of spastic or sub-spastic contracture of adductor muscles of the hip or hips in MBD.

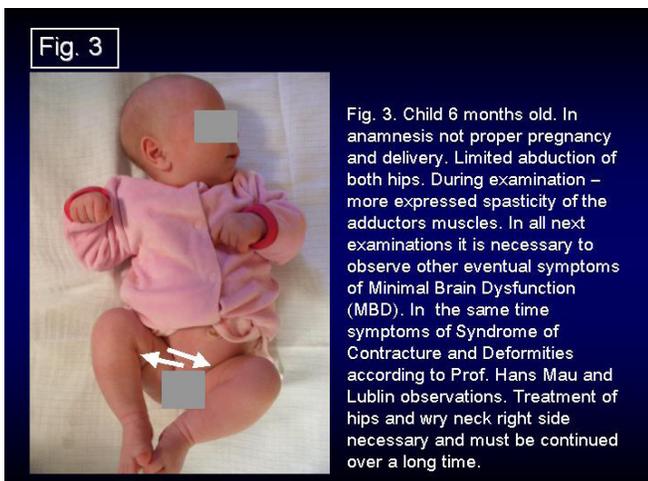


Fig. 3. Child 6 months old. In anamnesis not proper pregnancy and delivery. Limited abduction of both hips. During examination – more expressed spasticity of the adductors muscles. In all next examinations it is necessary to observe other eventual symptoms of Minimal Brain Dysfunction (MBD). In the same time symptoms of Syndrome of Contracture and Deformities according to Prof. Hans Mau and Lublin observations. Treatment of hips and wry neck right side necessary and must be continued over a long time.

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Therapy & Prophylaxis

In these three groups of dysplasia-the children need from first day of life till one or three years of life-permanent abduction and flex-

ion position of the hips. Here in prophylaxis, important is proper carrying of the newborns and babies. Older children should sit in proper position-typical like in karate "butterfly sitting"-knees flexed 90 or more degrees, feet in contact, hips in maximal abduction. The best is caring the child immediately from first days after birth "face to face" with gentle pressure on the pelvis. When the newborn is directed to mother chest with full / maximal abduction of their hips will never develop "hips dislocation". Later-just described upper - older children should sit in "butterfly position"-never with legs directed to side.

Extension Contracture of Trunk / of the Spine [7 - 11, 13, 15, 16] (Figure 4)

In many children with Minimal Brain Dysfunctions is to see extension contracture of trunk because of spastic tension and later shortening of extensor muscles of spine. This deformity is typical and in many cases one of the others deformities. During examination-on laying child-it is to observe "opisthotonus" symptoms-its mean "maximal extension position of trunk" with hyperextension of the neck.

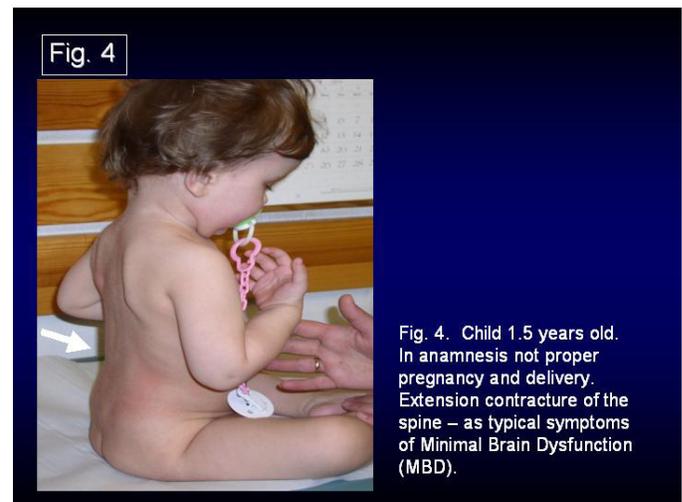


Fig. 4. Child 1.5 years old. In anamnesis not proper pregnancy and delivery. Extension contracture of the spine – as typical symptoms of Minimal Brain Dysfunction (MBD).

Figure 4: Child 1.5 years old. In anamnesis not proper pregnancy and delivery. Extension contracture of the spine – as typical symptoms of Minimal Brain Dysfunction (MBD).

Anterior Tilt of The Pelvis and Hyperlordosis of The Lumbar Spine (Literature 6, 7, 10, 11, 16) (Figure 5a, 5b)

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 hyperlordosis of the lumbar spine. In the cases of MBD - m. rectus (part of m. quadriceps) very frequent is spastic and too short and can cause the "flexion contracture of the hips"-and in result hyperlordosis of the lumbar spine. This deformity appears in 12% - 15 % of people in Poland. If hyperlordosis of lumbar spine is not successfully treated in childhood can be very serious problem of "low back pain" at / in adults.

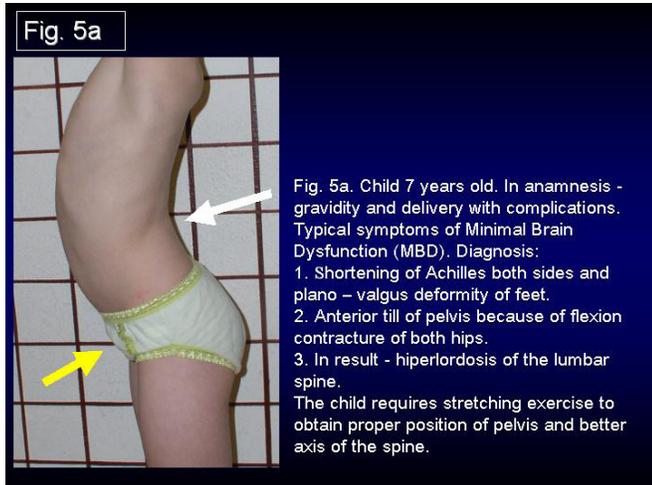


Fig. 5a. Child 7 years old. In anamnesis - gravidity and delivery with complications. Typical symptoms of Minimal Brain Dysfunction (MBD). Diagnosis: 1. Shortening of Achilles both sides and plano - valgus deformity of feet. 2. Anterior till of pelvis because of flexion contracture of both hips. 3. In result - hiperlordosis of the lumbar spine. The child requires stretching exercise to obtain proper position of pelvis and better axis of the spine.

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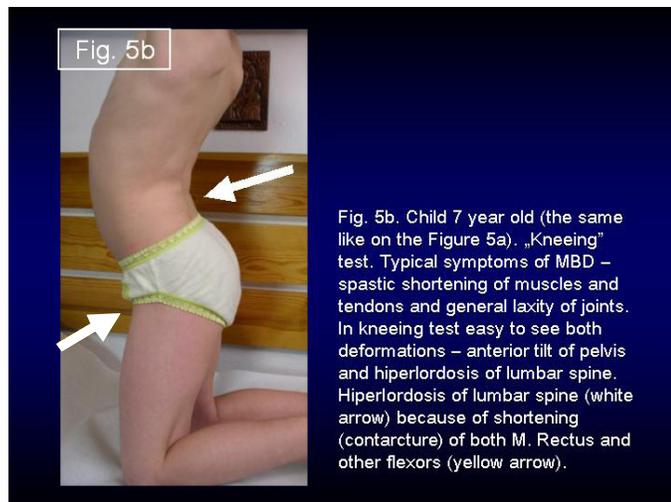


Fig. 5b. Child 7 year old (the same like on the Figure 5a). „Kneeing” test. Typical symptoms of MBD - spastic shortening of muscles and tendons and general laxity of joints. In kneeling test easy to see both deformations - anterior tilt of pelvis and hiperlordosis of lumbar spine. Hiperlordosis of lumbar spine (white arrow) because of shortening (contarcture) of both M. Rectus and other flexors (yellow arrow).

Figure 5b: Child 7 year old (the same like on the Figure 5a). „Kneeing” test. Typical symptoms of MBD - spastic shortening of muscles and tendons and general laxity of joints. In kneeling test easy to see both deformations - anterior tilt of pelvis and hiperlordosis of lumbar spine. Hiperlordosis of lumbar spine (white arrow) because of shortening (contarcture) of both M. Rectus and other flexors (White arrow).

Therapy

All symptoms of MBD-in feet, in knees, in position of pelvis and in spine-need the early and long - lasting therapy in “child’s period of life” through stretching exercises or “special positions”. We should see such early treatment as “prophylaxis program for adults”. The aim of therapy of “anterior tilt of pelvis” and “hyperlordosis of lumbar spine” need long lasting stretching therapy of flexors of hips. The exercises are similarly or full “the same” like in karate, taekwondo, aikido or yoga.

Laxity of joints, common and typical symptoms of MBD [6-11, 16-20] (Figure 6)

These abnormalities concern all joints of the body. The laxity of joints is not “because of “week muscles” but because of changed properties of the collagen. Very common in Poland and in other countries-doctors, physiotherapists see / diagnose this “week muscles” and recommend the “strengthened exercises as therapy”. Their diagnosis is not proper, therapy as well too. Unfortunately-the laxity of joints is not possible to cure. In next and following next years of life the laxity diminishes little, but is to see even in persons of 60 or 70 years old.



Fig. 6. Child 5 year old. Anamnesis - gravidity and delivery with complications. Typical symptoms of MBD. Sub - spastic shortening of muscles and tendons and general laxity of joints. On the picture - one of ten symptoms of „general laxity of joints” according to Wynne Davies.

Figure 6: Child 5 year old. Anamnesis - gravidity and delivery with complications. Typical symptoms of MBD. Sub - spastic shortening of muscles and tendons and general laxity of joints. On the picture - one of ten symptoms of „general laxity of joints” according to Wynne Davies.

Psychologically symptoms in children with MBD

All these-above described - orthopedic disorders of MBD are connected additionally with psychological symptoms. The behavior, in everyday situations, of the children with MBD is totally different. The children affected by MBD are often very nervous, they shout, they cry without any clear reason, they are not ready to discuss with their parents, they are not ready to answer parent’s question or listen to their explanations by talking to them. At the same time, they look for close contact with their mother, farther or grandparents, or sister or brother. They expect and they need - the love of their parents and the whole family. Our experience confirms- “the love given to the child” is an important point in program of therapy.

Other psychological symptoms are-more than normal activity. From hence other descriptions of MBD is ADHD-Attention-Deficit & Hyperactivity Disorder. One of the forms of hyperactivity is permanent jumping from various high objects such as chairs, sofas, window-sills, staircase, stairways, tree branches and other objects in child’s environment. The jumping repeated for many times, for example 20-30 - 40 times per day can cause the Legg - Waldenström - Calve-Perthes disease. This means - necrosis of femoral head. During repeated jumping the cartilage is resistant but the bone in the femoral head can be broken and from this moment

starts the whole process of necrosis of the femoral head-Perthes disease. As is written above-we have published the article about Perthes disease in International Journal of Orthopedic Research Kansas / USA in 2021 [22].

Therapy of Psychological Disorders and Changes in Children

My recommendation is-we should give to the child a permanent and long term “clever education” as methods of psychotherapy. The children need contact, they need the love of their parents every day and attention from their parents. The “love term” given to the child-all day, evening and night bring success for the child’s period of life and for all following years of life. The parents should also inform the children about danger of permanent jumping on hard surfaces. It is very an important program of the prevention of Perthes disease [4 - 6, 22].

Psychologically Symptoms-Adults

The material of patients with the symptoms of MBD consist of 15 % of suffered persons with disorders of locomotors system and at the same time various psychotically symptoms exist. All of the patients from this group are very nervous, they have problems in family, with others persons at home, very often they quarrel with their family. They are very often tired; they have sleeping problems. Every such patient reports about a “low back pain”, knee pain, feet pain symptoms. During examination very often the doctors can see-spontaneous, repeated movements of the legs of the knees, or feet. We speak about - “restless legs”. Such behavior confirms the words of ADHD- “hyperactivity disorders”, this means-symptoms of MBD. Here, I can repeat, these “nervous patients” have clinical disorders as described earlier:

1. Hyperextension (recurvation) of the knees,
2. Valgus deformity of the knees,
3. Valgus or plano-valgus deformity of the feet,
4. Flexion contracture of the hips,
5. As result - incorrect position of the abdomen-shifted forwards, buttock directed backwards,
6. Hyperlordosis of the lumbar spine as results of flexion contracture of the hips and very frequent “low back pain syndromes”,
7. General laxity of the joints-as a result of the changed properties of collagen. Very often in Poland and in other countries-doctors see this “laxity” as a result of “weakness of muscles”-but it is mistaken, not properly diagnosis. It is totally opposite-the muscles of the patients with MBD-are with spastic or semi-spastic tension.

Discussion

As an orthopedic surgeon and at the same time a rehabilitation doctor and a physiotherapist - since 1961 - in many patients with “abnormalities of the locomotors system” I could see-examples of “incorrect behavior / attitude”. We can observe the same phenomenon during everyday situations, on the radio, as for example during television debates, in the parliament, during protests. People’s behavior can be sometimes even aggressive and these situations have been frequenting in the XX and XXI.

Such behavior-concerns politicians, members of the parliament’, economists, doctors, journalists, clerks and many others groups of

people. Why? According to my observations there are three causes:

1. Genetically influences: connected with difficult social and -political situation in the country that lasts over time, in families, in group of physical workers, when life in some countries over years or even centuries is burdensome and demanding-people start to protest. This protest first concerns the opinion, next it is verbally expressed, then transform into “aggressive acts”. This group of people start to say in various situations only - “No”, “I do not agree”. They protest even against their governments or societies or superior’s proper arguments. They say-independently of the situation only “no” or “it is not my point of view” et cetera. They present a position of “generally and totally negation”-and such behavior-in time in “through and over generation”-can be “genetically fixed”.
2. Improper education of children, young people - also connected with the first point - in families, at school, in factories, in various groups of people,
3. The last causes of “improper behavior” and “negative attitude” in their life, concern the persons with Minimal Brain Dysfunctions (MBD). How to recognized the MBD influences? It is easy to see in these “nervous people” and with “not normal behavior”- recurvation of knees, hyperlordosis of lumbar spine, a specific manner and way of walking - more on toes and-what is especially easy to recognize - laxity of joints. For recognition-we should see and touch the hands of these persons-and will see one or more symptoms of general laxity according Wynne-Davies.

When we see the improper behavior of such “MBD-people”-we should adopt a friendly and kind attitude towards them, “clever - thanks education about MBD problems” and be ready for a “calm, peaceful and quiet discussion”, calm and quiet explanation of all arguments. In every such situation with a nice voice and with smile. People suffering from MBD need “psychological therapy”-not drugs. The most important is to recognize these psychological symptoms of MBD in children-and treat them completely and fully-and see such therapy as “prophylaxis for adults”.

Conclusions

1. In our clinical material there are-children and adults - ca 15 % - patients with symptoms of Minimal Brain Dysfunctions (MBD).
2. The clinical symptoms of MBD are: valgus deformity of feet, recurvation of knees, anterior tilt of pelvis and hyperlordosis of lumbar spine, general laxity of joints, very often- “pains syndromes”, insufficiency of walking, in daily activity, in sport, at work.
3. Incorrect psychological behavior of children and adults are frequent symptoms typical for patients with MBD.
4. The described “incorrect psychological behavior” is also connected with “genetically conditions” and “not proper and negative and tendency education” in families, in school, et cetera.
5. Orthopedic surgeons, neurologists, pediatricians, general doctors should be familiarized with MBD, diagnose the neurological and orthopedic disorders and introduce early therapy in children.

6. The proper therapy is based on two directions / ways-a/physiotherapy with kinesiotherapy and b/ psychological therapy.
7. In physiotherapy-important is to cure the shortened (contractures) oft tissues-tendons, fascia's, capsules, muscles to receive full and symmetrical movement of joints and proper position of "the parts of the body", proper loading, efficient walking and proper sitting and standing.
8. In children and in adults-the therapy should be "friendly and nice" and recommendations should be understandable for patients.
9. As prophylaxis and prevention of the MBD at children - we should remember about a proper behavior towards "pregnancy women" - and perceive this period of their life' as "blessed". It is the best prophylaxis of Minimal Brain Dysfunction in children.

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