INDIVIDUALS WITH PHYSICAL DISABILITY

"A Guide for Families"

Özel Eğitim ve Rehberlik Hizmetleri Genel Müdürlüğü

INDIVIDUALS WITH PHYSICAL DISABILITIES
"GUIDEBOOK FOR FAMILIES"

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INTRODUCTION

Hello dear parents - dear students,

Life becomes even more meaningful for us as we get to know virtuous, talented and conscious students like you and their parents. However, we are making an intense effort with all our friends in order to contribute to you and your parents. Contributing to education for you and your parents and collecting the fruits of these contributions is a source of joy for us.

In this respect, we have prepared a series of educational support book in order to serve as a guide for our esteemed parents, whose intense efforts we have always witnessed. Our aim is to enable the parents of our beloved students who need special education to support our students more consciously, to enable our students to recognize their inadequacies more closely, to know the characteristics of the situations they live in, and to learn the possible problems and solutions they may experience with the help of guidebooks containing basic information.

First of all, I would like to thank UNICEF for their support to the Strengthening the Capacity of Guidance and Research Centers to Provide Inclusive Education Services (RAMKEG), our esteemed academicians and valuable teachers who contributed to the preparation of the books in the light of scientific knowledge. I would also like to thank our parents and other student relatives who will support our students by using these guidebooks.

I hope that these guidebooks, prepared according to the types of disability of our students who need special education, will contribute to our students and you, our valuable parents, in providing a more qualified education life.

We are honored to be with our special students and their families at anytime, anywhere and in any situation.

Stay in good health and well-being.

Mehmet Nezir GÜL
Director General of
Special Education and Guidance Services

Introduction

Those who have limited physical abilities or lost their physical abilities to various degrees, have difficulties in adapting to social life and meeting their needs in daily life, and therefore who needs protection, care, rehabilitation, counseling and support services as a result of disorders in the skeleton (bone), muscle and nervous system due to any cause in the prenatal, birth and postnatal period, are called as physically disabled individuals, and the situations that lead to this are called physical disability. In these individuals who differ from healthy people due to physical disability and cannot benefit from educational services properly, it is of great importance to develop cognitive, psychosocial and sensory needs, as well as movement and functional abilities, and to take a holistic approach in education and rehabilitation.

Although there are many disorders, disabilities or diseases that cause physical disability, the most common conditions that cause physical disability in childhood are as follows;

1. Cerebral Palsy (CP),
2. Congenital (Obstetric) Brachial Plexus Injuries (OBPI),
3. Spinal Cord Closure Defects (Spina Bifida-Meningomyelocele),
4. Neuromuscular Diseases (NMD) - Nerve and Muscle Diseases

In this guide, information will be provided about the conditions that most frequently cause physical disability.

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CEREBRAL PALSY (CP)

This condition, which is abbreviated as Cerebral Palsy (CP), is known as a neuro-developmental problem that causes disturbances in sensation, perception, posture and movement that occur as a result of the effects of the developing brain (from the beginning of pregnancy to the end of the second year) for various reasons [1]. It occurs due to a number of problems that may occur before, during and after birth. The severity of the clinical picture that emerges varies depending on the degree of brain effect, the location of the damage and the age of the individual.

The condition that occurs in the brain is not progressive, but deficiencies in the musculoskeletal system that occur with growth significantly restrict the individual's performance. The form that affects the whole body is called tetraparesis/tetraplegia (quadriparesis/quadriplegia), the form that affects mostly legs is called diparesis/diplegia, the form affects one side of the body is called hemiparesis/hemiplegia, and the form affecting one arm or one leg is called monoparesis/monoplegia.

CP is classified according to the affected area in the brain or body. It is divided into 3 according to the affected area in the brain.

1. Spastic Type Cerebral Palsy

Depending on the affected brain region, it progresses with tension and stiffness in some muscles. In the early period, there is a general laxity in the body muscles and stiffness in the arm and leg muscles. Uncontrolled muscle stiffness in the early period negatively affects movement and posture, causing irreversible muscle shortness and limitation of movement in the joints over time. This situation causes deformities to settle in different body parts in the future.

2. Dyskinetic Type Cerebral Palsy

It manifests itself with involuntary, uncontrolled and likewise repetitive movements. It usually starts with muscle laxity in the early period, then muscle stiffness changing during movement are observed. According to the predominance of the observed repetitive motion, it is subdivided as dystonic and choreatetoid. While "dystonic type cerebral palsy" is seen with involuntary, continuous or intermittent muscle contractions, in Choreatetoid type cerebral palsy, increasing and decreasing fluctuations in muscle tension are seen.

3. Ataxic Type Cerebral Palsy

It manifests itself in deficiencies in movement control, abnormal posture, and inability to perform the movement in a coordinated way. During the first years of life, children are usually relaxed. With the start of walking, ataxia develops over time and balance problems emerge and it becomes more evident after the second year.

Cerebral Palsy is examined in 2 main groups according to the stiffed region of the body.

1. **Unilateral stiffness:** One side of the body is affected. Sometimes an arm or leg (monoplegia) and sometimes both an arm and a leg (hemiplegia) are affected.
2. **Bilateral stiffness:** Both halves of the body are affected. The stiffness may involve both arms and legs (quadriplegia or tetraplegia), as well as only 2 legs (diplegia).

Causes of Cerebral Palsy

The causes of cerebral palsy are assessed in 3 main topics: prenatal, during birth, and postnatal. [2, 3]

Prenatal causes

- Blood incompatibility
- Infections
- Metabolic diseases (Diabetes, high blood pressure etc.)
- Lack of oxygen in tissues (Carbon monoxide poisoning, anemia, hypotension, cord entanglement)
- Bleeding (maternal poisoning, trauma and bleeding)
- Mother's age (less than 16 years old or over 40 years old)
- Hereditary reasons

Causes during birth

- Premature birth (births before 34 weeks)
- Low birth weight (≤1500 g)
- Difficult birth
- Severe jaundice
- Being without oxygen
- Inability to breathe
- Multiple pregnancy
- Use of forceps

Postpartum causes

- Infections
- Accidents
- Tumoral causes
- Poisoning
- Bleeding
- Traumas

Symptoms of Cerebral Palsy

Delay in the developmental stages, posture and movement disorders, muscle weakness, balance problems, stiffness or laxity in the muscles and coordination disorder are among the main symptoms. Especially the delays in the motor development stages are very important in diagnosis. If the child;

- cannot hold his/her head in the 4th month,
- his/her hands are closed and the thumb is in the palm in the 4th month,
- cannot get his/her feet in his mouth in 6th month,
- his/her thumbs move in the palm in 6th month,

- he/she uses one hand more than his/her other hand in the 8th month,
- cannot raise himself from the ground and cannot raise his/her head and upper body while his/her elbows are straight in the 8th month,
- cannot bring both hands to the midline and cannot hold objects in the middle in the 10th month,
- cannot sit independently and crawl in the 10th month,
- cannot leave the objects voluntarily in the 12th month,
- cannot stand up by holding the sofa in the 12th month,
- cannot stand alone in the 14th month,
- cannot walk independently in the 18th month,
- cannot climb or go down the stairs independently or cannot jump in 30th month, then the family is recommended to consult a pediatric neurologist.

ATTENTION: If one or more of the above-mentioned symptoms are seen, it is recommended to consult a pediatric neurologist as soon as possible.

The Most Common Problems in Cerebral Palsy

Muscle stiffness (Spasticity): Indicates that the brain is affected for some reason. Muscle stiffness and movement limitations are observed. In uncontrolled situations, irreversible muscle shortness occurs in the muscles and this situation negatively affects the daily life of the individual.

Muscle weakness: In cerebral palsy, muscle laxity and muscle weakness are observed in the early period. These weaknesses restrict the individual to act independently in daily life. While the deficiencies in fine muscle skills restrict the use of hands in daily life, the deficiencies in coarse muscle development significantly restrict the individual from sitting, walking and climbing stairs.

Muscle shortness and deformities: Muscles shortening is observed due to the effect on the brain, and shape deformities are observed on the body, arms and legs due to shortening muscles over time. This situation may affect the daily life of the individual and cause pain over time.

Posture and movement disorders: Muscle stiffness, muscle shortness, muscle weakness and shape deformities that develop over time affect posture and movement negatively. Especially, curvatures (scoliosis) that may develop in the spine, and problems in the hands and feet make it difficult for the individual to sit, walk and position.

Attention: The severity of the symptoms seen in a child with cerebral palsy varies according to the child's influence status. For this reason, it is necessary to create an individualized education, physiotherapy and rehabilitation program for each child.

Problems Accompanying Cerebral Palsy

Nutritional problems: Sucking and swallowing problems can be observed in early infancy. Cough seen especially during drinking water can be a sign of nutritional problems.

Cognitive problems: Cognitive problems may accompany cerebral palsy. However, not every individual with cerebral palsy has cognitive problems. Furthermore, in some cases, it is seen that intelligence is above normal limits.

Epilepsy: It occurs when the electrical activity between brain cells is disrupted. Epilepsy accompanies 22-40% of the cases with cerebral palsy. The frequency of epileptic seizures is generally expected to decrease after the age of 16. Since this condition may affect vital functions and development, it is recommended to be examined by a pediatric neurologist at an early stage.

Tongue and Speech problems: Speech disorders are directly proportional to the severity of cerebral palsy and are common. The problems that occur may be related to the muscles around the mouth-tongue, as well as due to the influence of the language-speech center in the brain.

Visual disturbances: Visual problems that occur especially with early birth are mostly manifested by strabismus. However, a decrease in visual depth and acuity, and visual perception disorders may accompany the situation. In case of doubt, the family is recommended to consult an ophthalmologist as soon as possible.

Hearing problems: Hearing loss of different severity can be observed depending on the effect on the brain. Since this may affect learning and language-speech development, the family is recommended to consult an otolaryngologist at early stage.

Stomach and intestinal problems: Muscle laxity and/or stiffness associated with posture and movement disorders can often cause reflux, vomiting, chronic constipation and chronic abdominal pain. In the presence of such a situation, the family is recommended to consult a gastroenterologist.

Respiratory system problems: It may occur especially due to the lack of development of the lung and related structures due to preterm birth, and chronic lung disease may develop due to pneumonia (lung infections) caused by the leakage of solid and liquid foods into the respiratory tract, problems in the coordination of the respiratory muscles and orthopedic problems such as scoliosis (curvature of the spine). In the presence of such a situation, the family is recommended to consult a pulmonologist.

Bone resorption (Osteoporosis): Causes such as nutritional deficiencies, antiepileptic (against epilepsy) drugs and inactivity in children with Cerebral Palsy may cause bone resorption and bone fractures in the later periods.

Oral-motor problems: In cerebral palsy, the laxity of the muscles around the mouth, general muscle stiffness, and muscle laxity in the body cause oral motor problems. This situation negatively affects the ability to eat and chew.

Chronical pain: Shape deformities in the musculoskeletal system with advancing age, especially scoliosis in the body (spine curvature), and dislocation in the hip joint are the main causes of pain. However, apart from this, chronic stiffness in the muscles, limitation of movement and constipation are known as other factors that cause pain.

Urinary incontinence: It is known as the cause of urinary incontinence due to excessive activity of the bladder muscle, increased and decreased muscle tensions or neurogenic bladder (caused by the effect of the nervous system). In such a case, the family is recommended to consult the family urologist.

Sleep problems: In children with cerebral palsy, pain, muscle stiffness, blockages in the airways, and sensory problems can cause sleep problems.

Early Intervention

Since it is known that brain development (neuralplasticity) is very fast especially in the 0-3 age period, it should be kept in mind that early interventions such as physiotherapy and rehabilitation, special education, language and speech therapy, and occupational therapy play a very important role in ensuring that the individual is independent in all development areas. Professionals working in interaction with a holistic perspective, and supporting all development areas simultaneously will bring success in physical, cognitive, language and speech, emotional, psychological and social development areas.

You can use the following links for more information about cerebral palsy, its treatment, rehabilitation, family education, social rights and motor development.

https://www.aacpdm.org,

https://pathways.org

https://www.canchild.ca

https://cerebralpalsy.org.au

http://www.sercev.org.tr

http://www.cpcare.eu/tr/

Treatment Methods

Medication

It is used to control seizures, more commonly known as epilepsy. In addition, some medications can be used to relax the muscles with stiffness.

Physiotherapy and rehabilitation

The aim is to determine the performance of the individual with cerebral palsy and to provide independence in daily life by increasing his/her current performance. The main goal of the physiotherapy and rehabilitation program is to protect and develop what the individual can do to the extent of his capacity, rather than focusing on the inabilities seen in the individual. Therefore, the physiotherapy and rehabilitation process should begin in early infancy for each individual. It is aimed to be independent for an individual in daily life by taking advantage of the early infancy period when the brain development is very fast. In order to achieve goals, functional and goal-oriented approaches in which the family and the child are followed together should be included rather than passive methods [4].

Although basic characteristics such as age, gender and diagnosis are similar, assessment, physiotherapy and rehabilitation programs should be tailored private to the individual and should be implemented in the natural environment where the child lives with family support.

Individualized goals should be set for children and families. While determining the goal, the expectations, priorities, values, needs and desires of the child and the family should be taken into consideration. Instead of choosing a single treatment approach, making use of many approaches to be preferred in line with individual needs will positively affect the success of the treatment.

Botulinum Toxin injections

It is a method applied directly to the muscle in order to reduce muscle stiffness, improve movement skills and reduce pain. Increasing muscle function and increasing joint range of motion after the injection creates a suitable basis for an effective physiotherapy and rehabilitation program.

Orthopedic and Surgical Approaches

Surgical Practices: Various soft tissue and bone surgeries are used to control the musculoskeletal system problems observed in cerebral palsy. Surgical practices performed when necessary affect the function and quality of life positively in cases with cerebral palsy.

Orthoses (equipment used to support body parts) and Technological Supports [5]

Many lower extremities (body parts including feet, legs and thighs), upper extremity and body orthoses are used to increase participation in daily life restricted by muscle weakness, balance disorder, gait disturbances, increase in energy consumption and deformities (impairments) observed in individuals with cerebral palsy. Orthosis in CP has many purposes, such as increasing the function, preventing the development of contractures (irreversible shortening and stiffness in the muscles) and deformity, keeping the extremities in a functional position, stabilizing the extremities and body, supporting weak muscle functions, reducing muscle tensions and protecting the relevant body area after surgery. It may be possible to benefit from devices and equipment starting from insoles that support only the foot-ankle, extending to the hip and body.

It is possible to benefit from standing and walking aids suitable for the individual's needs in order to preserve the current potential of the individual and to provide functionality.

ATTENTION: The sooner the education and rehabilitation process begins at children with cerebral palsy, the higher the chances of reaching the child's maximum level of independence.

BOOK 1- To learn more about cerebral palsy and its treatment, check out the book "Bülent Elbasan [Editor] (2019). Pediatrik Fizyoterapi ve Rehabilitasyon. İstanbul Tıp Kitabevi, İstanbul."
BOOK 2-For more information about cerebral palsy and its treatment and family education, check out the book "Muharrem İnan [Editor] (2016). Serebral Palsi Aile Rehberi. Boyut Yayın Grubu, İstanbul."

CONGENITAL (OBSTETRIC) BRACIAL PLEXUS INJURIES (OBPI)

It is a condition that causes paralysis of different severity in the arm of the baby as a result of the injury of the nerves that come out from the neck vertebrae to the arm during birth. It is mostly seen unilaterally, sometimes in both arms.The nerves that make up the Brachial Plexus are mixed-type nerves.

They carry both motor (movement) and sensory impulses. These nerves branch as they descend from the brachial plexus and take the names of Radial Nerve, Axillary Nerve, Ulnar Nerve, Musculocutaneous Nerve and Median Nerve. Each nerve carries the sensation of a particular arm region and provides representation in the brain by carrying signals to the muscles.

Causes

Although there is no prevalence study completed in our country yet, it is accepted that OBPI occurs in 0.44% of live births. As numerical data, despite the increase in awareness about trauma and the number of deliveries by cesarean section, no major changes were observed in this ratio. The likelihood of OBPI occurring and the degree of injury depend on the characteristics of the mother and the baby as well as the complications that may develop during delivery.

Although there are many different risk factors in written publications, it is stated that most of the individuals with OBPI do not have any of them.

Factors for the Baby	High Birth Weight (4000 gr and above) Breech Delivery
Factors for the Mother	Diabetes Mellitus/Glucose Intolerance Obesity/Excessive Weight Gain at Birth Mother's Age (> 35) First birth Mother's Pelvic Anatomy (Platypelloid Pelvis, Straight Pelvis) Uterine Anomalies Mass in the uterus
Factors Associated with Birth	Shoulder Dystocia (Shoulder Entrapment), Extension of the Second Stage of Delivery, Assisted Vaginal Delivery (Use of Forceps)

Classification of Congenital Brachial Plexus Injuries

The OBPI classification is named according to which nerves from the spine are affected. In general, there are 4 classifications as upper, middle, lower and total:

1. Upper Brachial Plexus Injuries, involve C5–C6 nerve roots, C7 may also sometimes be involved in this injury. It is called Epididymal Paraplegia and it is the group with the highest incidence in OBPI.
2. Medium Type Brachial Plexus Injuries, involve the C7 nerve root, and C8–T1 nerve roots may also sometimes be involved in this injury. This type of injury has been observed in very few numbers.
3. Lower Brachial Plexus Injuries, involve C8–T1 nerve roots. It is also named as Klumpke's Paralysis.
4. Complete Brachial Plexus Injuries, involve C5–C8 nerve roots and the T1 nerve root may also be involved in this injury and is the second most common injury type.

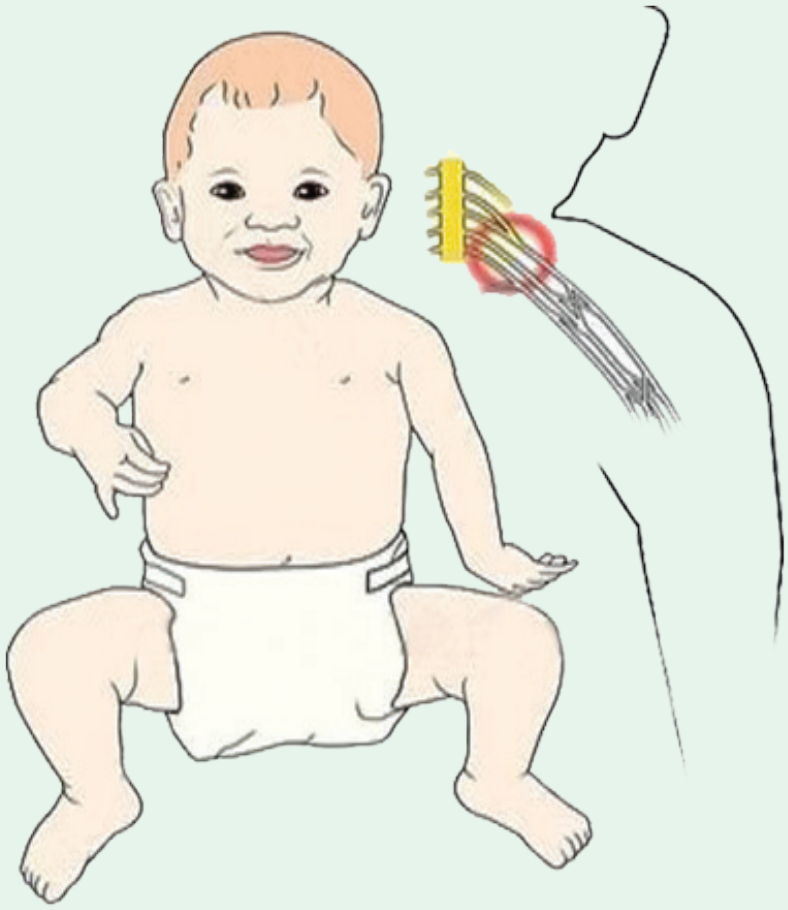
Treatment Methods

Physiotherapy and Rehabilitation

Physiotherapy and rehabilitation practices should start at the earliest period in the treatment of OBPI, with or without pediatric nerve surgery. Physiotherapy practices can be carried out together in Ministry of Education Special Education and Rehabilitation Centers and institutions affiliated to the Ministry of Health. Physiotherapists carry out the treatment program in cooperation with the relevant physicians and healthcare professionals. [7].

Basic purposes in physiotherapy practices:

1. To protect the structures under the injury area during the nerve recovery process, until the nerve stimulation reaches the muscles and joints,
2. To increase or protect the movements in the shoulder, elbow and wrist joints,
3. To prevent shortening and stiffness of the muscles and ligaments,
4. To prevent stiffness in joints and shortening of bones,
5. To create sensory-motor activities in a way that provides the connection between the upper part and the lower part of the nerve injury,
6. Increasing the functional use of the arm and hand during activities,
7. To improve the use of two hands,
8. To take game and exercise approaches that will enable him/her to gain skills appropriate for his age
9. To support orthosis, splint (equipment used to appropriately position mostly the hand and elbows) or structures related to banding support required in the early period,



10. Trying to place the correct body image from the earliest period by preventing abnormal movements that occur during the use of the affected side arm,
11. To encourage the awareness and use of the hand by ensuring the connection between the hand and the brain,
12. To support sensory development.

The physiotherapy process can be planned in 3 stages: early period after injury, after primary surgeries, and after secondary surgeries:

Surgical Practices

While the baby's physiotherapy process continues, surgical treatments may be required depending on the recovery status of the nerves. Surgical approaches applied in OBPI can be classified as primary surgeries and secondary surgeries.

Primary surgeries; include the repair of damaged nerves. Total brachial plexus involvement, C7 involvement in addition to the upper truncus and Horner's sign indicate poor prognosis. If there is no functional recovery in the arm between 3-6 months, the baby is a candidate for neurosurgery. Significant improvements are observed in the majority of patients treated using micro-surgical methods in the early period. However, reaching a normal level is not yet possible with today's techniques.

Secondary surgeries; include surgical interventions for secondary problems in the shoulder, elbow and forearm. If there is no improvement in the child's condition despite the child has been taking regular physiotherapy for 3 months or more, secondary surgeons can be decided after the evaluation of the follow-up doctor and physiotherapist. When surgeries are performed incorrectly selected patients and at the right time, they provide significant benefits.

ATTENTION: In Congenital Brachial Plexus Injuries, physiotherapy and rehabilitation should start as soon as the child is born and the process must be continued before and after surgery.

Orthesis Practices

They are auxiliary tools used to support joints such as shoulder, elbow and wrist. It can be made of plastic, cloth and different materials. We can also put tapes that are affixed to the body in this group. Orthoses in OBPI are used to correct, support and protect muscle and joint positions, and sometimes to facilitate movement.

Things to Consider About Orthosis Use

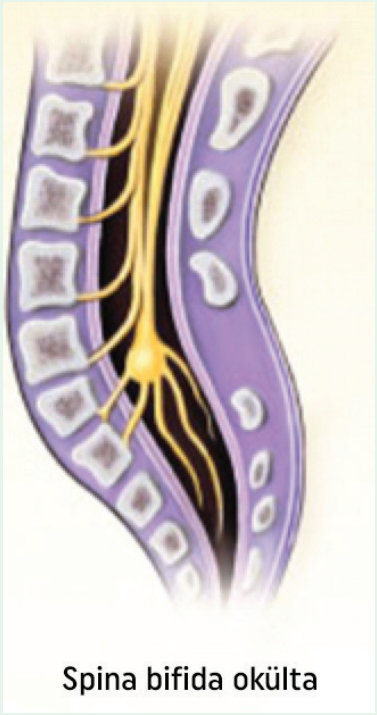
- If your child has an orthosis used, use it in the recommended direction. But if he/she has a night orthosis and the child cannot sleep when he/she wears it, or if he/she is very restless and crying, don't force inform the experts about this. Good and quality sleep is paramount for nerve recovery.
- If the child uses the orthosis but a decrease occurs at his/her movements after using the orthosis, inform the experts on this issue.
- The orthosis may sometimes shrink or tighten, and your baby may not feel it because of his/her sensory weakness.
- When removing the orthosis, always look at your child's arm generally. Let your specialist know if there is any redness or pressure-bruising.

BOOK: For more information about cerebral palsy and its treatment, check out the book "Bülent Elbasan [Editor] (2019). Pediatrik Fizyoterapi ve Rehabilitasyon. İstanbul Tıp Kitabevi, İstanbul."

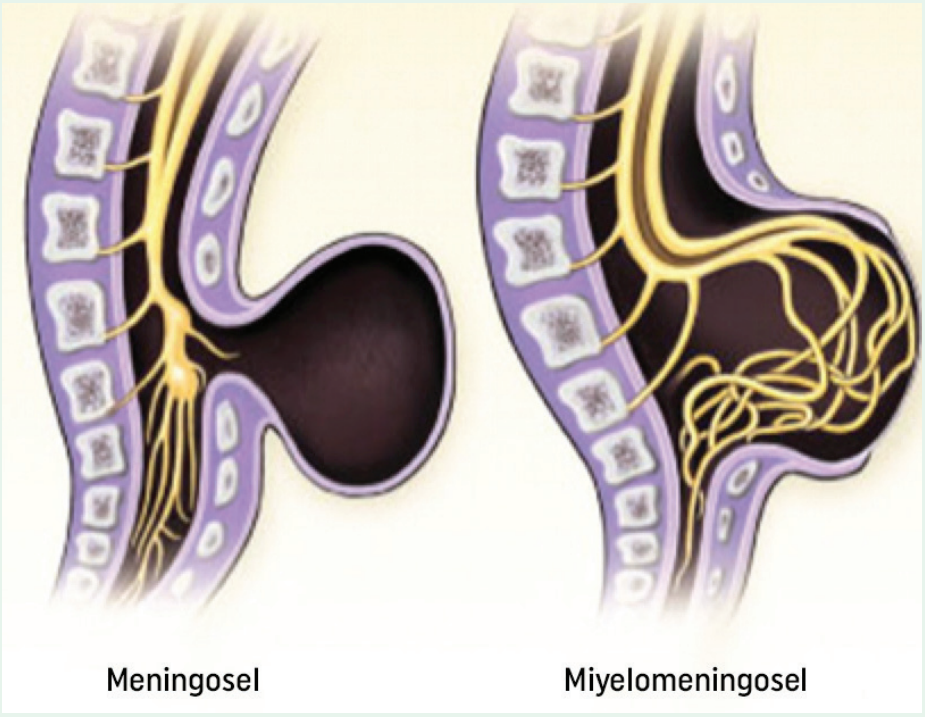
SPINAL CORD CLOSURE DEFECTS (SPINA BIFIDA-MENINGOMYELOCELL)

It is a disease in which the spinal cord and spinal fluid become herniated as a sac outward and causes paralysis at legs in varying degrees unilateral or bilateral. In some patients, the accumulation of the cerebrospinal fluid in the brain as a result of closed circulation in the brain and therefore the enlargement of the head (hydrocephalus) can be observed. Hydrocephalus is a condition that can seriously hinder brain development [8].

It is known as the closure defect as a result of the error that occurs during the formation of the spinal cord structure in the life continuing in the mother's womb. In spina bifida, the problem occurring in the vertebral body (which may be in one or both spinal cells) is quite common and may rarely be accompanied by spinal cord malformation. Spinal dysraphism can occur open or closed. Closed spina bifida is the type that neural tissues and spinal elements are not exposed, the skin is intact, and with skin symptoms such as hair growth or discoloration. Open spina bifida is the type where meningeal structures and/or neural elements are exposed or in a sac.



Spina bifida okülta



Meningosel Miyelomeningosel

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Types

Spina Bifida Okülta: Also known as latent spina bifida. It is the lightest form. Usually, it does not show any symptoms. There is no herniation of the meninges (membranes surrounding the spinal cord) in the spina bifida okultata. Spinal cord and nerves are normal. In more than 90% of the cases, abnormalities such as dermal sinus, dimple-shaped pitting, hemangioma (vascularization), lateral cleft (mass in the neck), lipoma (fat cyst) are observed. But the back skin is epithelialized. Children can be followed with asymptomatic or urinary system problems, sensory loss or weakness in the lower extremities, difficulty in walking, and foot deformity, depending on the degree of neural involvement.

Meningosel: The least common type of spina bifida (meningeal cyst). It is the protrusion of the meninges sac without containing neural elements through the defect. Some vertebrae are open on the outside and the membranes surrounding the spinal cord herniate from here. The spinal cord itself is not affected.

Miyelomeningosel: It is also be named as meningomyelocele and is known as open spina bifida. It is the most serious form of spina bifida and the most common type. The problem is the inability to close the posterior part of the neural tube. Spinal nerves and nerve roots herniated from the large posterior defect of the sheath surrounding the bone and nerve. Occasionally, the cyst does not form, however, the spinal cord itself may herniate completely and the fluid surrounding the spinal cord may escape. Failure to close the opening with surgery is a cause of infection in babies. Muscular or sensory problems can be seen in babies despite surgery.

Causes

Today, the exact cause of spina bifida is unknown, but it is estimated that folic acid deficiency plays an important role. The incidence of the disease is much lower in European countries due to the awareness on this issue.

5 out of every 100 newborns are born with spina bifida, and the risk increases to 15 percent in the next baby of the mother who gave birth to a baby with spina bifida once. Therefore, if a second pregnancy is considered, it is important to start using folic acid beforehand.

Women with diabetes who are not well controlled and who are overweight (obese) have an increased risk of having a child with spina bifida.

Treatment Methods

The baby with spina bifida that has been decided to be born should be operated within the first 36 hours after the birth. When such a pregnancy occurs, the neonatal specialist or obstetrician shall contact the relevant pediatric surgery team and this baby can be operated immediately after the birth.

Surgery

If the baby has a meningocele, within 36 hours after birth, the surgeon places a membrane around the spinal cord, puts the spinal cord back where it is out and closes the opening.

If the baby with spina bifida was born with myelomeningocele, the back tissue and spinal cord are placed in place and the sac is closed surgically. If hydrocephalus has developed, the “shunt” system that drains the excess fluid in the brain into the blood circulation of the body is placed in the brain.

Physiotherapy and Rehabilitation

At the children diagnosed with spina bifida, the child’s ability to regain his maximal function and use his potential depends on the continuity of physiotherapy and rehabilitation programs and mother-child-therapist cooperation. The family’s care for the child every day will provide positive support to the child’s life as well as to increase his/her abilities. Family habits can affect the development of the child positively or negatively in this sense. The treatment program is especially successful in young children with family education and support. Including the family in the treatment program means increasing the gains at the child [9].

The main purpose of physiotherapy in these children is to ensure the normal development of the child within the framework of neurological limitations and to reach the highest possible level of independence. In this context,

- To provide physical abilities to gain independence,
- To gain independent mobility (walking or wheelchair use),
- To prevent the development of deformity (disorder) and contracture (irreversible muscle shortness and stiffness seen in the muscles) are among the main goals.

In order to achieve these gains in children, the approaches such as supporting normal developmental stages in treatment programs, increasing and maintaining muscle strength and endurance, preventing joint movement limitations, gaining sensory functions, preventing bladder-bowel problems, increasing proprioception (deep sensation), teaching transfer activities should be applied. Physiotherapy and rehabilitation programs last from birth to adulthood.

ATTENTION: Sensory loss due to exposure level is very important in children with Spina Bifida. The skin of the child should be carefully checked every day, especially due to the pressure that may occur during the use of the device.

BOOK: To learn more about Spina Bifida and its treatment, check out the book "Bülent Elbasan [Editor] (2019). Pediatrik Fizyoterapi ve Rehabilitasyon. İstanbul Tıp Kitabevi, İstanbul."

NEUROMUSCULAR DISEASES (NMD) - NERVE AND MUSCLE DISEASES

Neuromuscular Diseases (NMD) - Nervous and Muscular Diseases, is observed with widespread and progressive weakness in the muscles, which are one of the most important elements of the movement system, shape deformities due to inactivity in the joints and spine, scoliosis in the spine, respiratory problems due to the effect of respiratory muscles. Because of these features, neuromuscular diseases are among the diseases that need rehabilitation and care services due to functional disabilities and should be supported.

Rehabilitation in neuromuscular diseases begins immediately after diagnosis. The rehabilitation process should be carried out with a transdisciplinary approach (a team of different professionals), in which the cornerstones are formed by the neurologist/pediatric neurologist, physiotherapist, occupational therapist and orthopedist, taking into consideration the potential and limitations of the patient. There is no single program that covers all patients, the program must be customized to the needs of each patient and family [10].

Definition and Classification

Definition

Neuromuscular diseases are a broadly defined group of diseases that involve damage or dysfunction of peripheral (nerves originating from the spinal cord and extending into different parts of the body) nerves or muscle.

Neuromuscular diseases; are a group of diseases that affect the muscle itself (muscle diseases - myopathies, dystrophies), the nerve that feeds the muscle (neuropathies), the nerve cells in the spinal cord where this nerve comes out, and the muscle nerve connection (junction diseases). Some neuromuscular (including nerve and muscle) diseases also affect the central nervous system, however; mostly limited to the peripheral nervous system. Most of them are hereditary diseases and include a large group of diseases.

Classification

The rough classification of neuromuscular diseases is shown in Table 1 [11].

General Anatomical Classification of Neuromuscular Diseases
Diseases involving the Motor Neuron
Spinal Muscular Atrophies (SMA) Amyotrophic Lateral Sclerosis (ALS) Post Polio Syndrome
Diseases involving the peripheral nerve
Hereditary Sensorimotor Neuropathies Gullian Barre Chronic Inflammatory Demyelinating Polyneuropathies (CIDN)
Diseases involving the nerve-muscle junction
Myasthenia Gravis

Other less common diseases
Duchenne Muscular Dystrophy (DMD) Becker Muscular Dystrophy (BMD) Polymyositis (PM) Dermatomyositis (DM)

Diseases Involving Motor Neuron

As a result of the abnormality of the anterior horn cells in the spinal cord, the impulse that operates the muscles cannot reach the nerves and muscles from the spinal cord, and the muscles become weak and melting (atrophy) occurs. This genetically transmitted disease may cause symptoms in newborn babies as well as occurring in adults. Findings are usually in the form of muscle weakness, laxity in muscles, difficulty in breathing and deficiency in the movement in infancy, and muscle weakness, limitations in joint movements, difficulty in standing and inability to walk in children and adults. These diseases are; SMA Type1 (Werdnig-Hoffman), SMA Type2 (Intermediate type), SMA Type3 (Kugelberg-Welander), and SMA Type4. The diseases seen in childhood and involving motor neuron are Spinal Muscular Atrophies and Poliomyelitis.

Diseases Involving Peripheral Nerve

It is characterized by weakness and disability in the transmission of commands from the spinal cord to the muscles, starting in the knee region and the muscles below it (around the leg-feet) and hands as a result of abnormal nerves. Sensory (sensation) disorders in hands and feet can be seen in some types of these genetically transmitted diseases seen until the age of 20. Symptoms are generally in the form of weakness, fatigue, foot shape deformities, difficulty in walking, shape deformities and weaknesses in the hands. Neuropathies in childhood and infancy, Hereditary Sensori Motor Neuropathy-HSMN (Charcot-Marie-Tooth): Most of the sensory neuropathy conditions such as HSMN Type1, HSMN Type2, HSMN Type3.

Diseases Involving the Nerve-Muscle Junction

It occurs as a result of an abnormality in the nerve-muscle composition in the transmission of commands from the spinal cord to the muscles. It is characterized by weakness and fatigue involving some or all muscles. It is generally seen between the ages of 0-40, complaints in the eye muscles, fatigue during/at the end of the day may be evident and weakness recovered by resting may be seen (Myasthenia Gravis).

Diseases Involving the Muscles

It includes the types that cause mild symptoms as well as diseases that can cause severe disability as a result of abnormalities in the muscles. It is known that there are varieties among these diseases that can reduce the life span. In this group, which usually occurs in the 20s, muscle weakness, disorders in joints and posture (especially in the spine), difficulty in movement, fatigue, respiratory system deficiencies, difficulty in walking and climbing stairs. These diseases are; Muscular Dystrophies (Duchenne, Becker, Fasioscapulohumeral, Limble-Girdle, Distal, Emery-Dreifuss), Congenital Muscular Dystrophies (Merosine (+), Merosine (-), Walker-Warburg, MEB et al.), Myopathies (central core, minicore, nemaline, metabolic types, mitochondrial diseases etc.), Myotonies, Dermatomyositis-Polymyositis, Endocrine Myopathies).

Causes

Neuromuscular diseases are of genetic origin. They can be transmitted from generation to generation via chromosomes. Our body is made up of millions of cells. These cells, which are so small that we can only see them with a microscope, come together to form tissues, tissues form organs, organs form systems and systems form body.

Inside each cell there is a structure called the nucleus, which controls and manages the cell. Within this structure, there are chromosomes that contain many information from hair color to height, blood type to gender. Each person has 23 pairs, a total of 44 + XX/XY chromosomes. Half of these chromosomes come from the father and half from the mother, and 2 of these chromosomes determine the gender.

MALE XY (The X chromosome comes from the mother and the Y chromosome from the father.)

FEMALE XX (The X chromosome comes from the mother and the X chromosome from the father.)

Neuromuscular diseases are a group of genetically transmitted diseases. Many diseases may occur when the genes of the mother, father or both with disease are transferred to the children. More than one person in the same family may be carrying the diseased genes.

Clinical Features

What are the First Symptoms?

- Retardation in motor development (inability to hold head, late walking, inability to walk)
- Laxity in the muscles
- Increased or decreased motion in the joints
- Difficulty at getting up and going up and down stairs
- Frequent falls
- Late walking disturbances, deficiency to run or inability to run
- Walking on toes or walking like ducklings
- Quick fatigue
- Deformities in limbs (arms and legs) and spine

Major Effects

Progressive weakness in skeletal muscles underlies many clinical problems. Except for neuropathies in NMD seen in childhood, upper group muscles such as hip and shoulder circumference are affected. For example, in Duchenne Muscular Dystrophy, the muscles around the hip and shoulder are affected first, while the foot and wrist muscles are affected in neuropathies.

The biggest problem caused by muscle weakness is the loss of the person's ability to perform activities and functions. The progressive weakness of the muscles around the hips, in particular, shall develop inadequacy in many functional activities such as getting up from the ground, walking and climbing up and down stairs, and shall affect the person's quality of life and independence level negatively.

Body smoothness may be impaired as a result of progressive and widespread muscle weakness. Due to the force imbalance that occurs especially in the muscles around the joint, shortening of some muscles and consequently restrictions in the ankle, knee and hip joint movements may occur.

Curvatures called scoliosis may occur in the spine due to the increase in weakness in the trunk muscles and the collapse of one side in sitting without support. These restrictions and curvature of the spine progress rapidly at the patients who lose the ability to walk due to staying in the same position for a long time. Permanent deformities in the joints, generally in the form of bending, may occur.

The age of onset of muscle weakness varies according to each disease. While weakness in Duchenne Muscular Dystrophy starts between the ages of 2-6; In Congenital Muscular Dystrophy and Spinal Muscular Atrophy, widespread muscle weakness and permanent deformities are present at birth. Breathing problems as a result of progressive weakness in the respiratory muscles can be serious at Duchenne Muscular Dystrophy, Spinal Muscular Atrophy, and congenital muscular dystrophy. In SMA and congenital muscular dystrophies, respiratory problems are also accompanied by swallowing difficulties.

Organ/ Structure	Disorder	Physical insufficiency	Limitation
Musculoskeletal System	Decrease in strength and endurance	Decrease in motor performance Inability in functions requiring displacement such as walking and mobility Difficulty in Daily Life Activities Increased fatigue	Restriction at participation in society Restriction at educational opportunities Restriction at job opportunities Increased dependence on others Restriction at social roles Decrease in quality of life
Bones, joints	Joint deformities Scoliosis (curvature of the spine) Ache	Inability to perform mobility and daily life activities	
Lungs	Decreased respiratory function	Decrease in endurance Increase in fatigue	
Heart	Cardiomyopathy Transmission defects	Decrease in cardiopulmonary adaptation Decrease in endurance Increase in fatigue	
Central Nervous System	Decrease in intellectual capacity	Decrease in Learning Ability Decrease in psychosocial adjustment	

Table 2: Features of disorders, functional impairment and disability in NMD

Diagnostic Processes

a. **Medical Diagnostics:** Medical diagnosis of neuromuscular diseases is performed by pediatric and adult neurology specialists. Although the diagnostic methods vary according to different subgroups, the gene that causes Duchenne Muscular Dystrophy, Becker Muscular Dystrophy and Spinal Muscular Atrophies that involves the motor neuron, which are included in the group of neuromuscular diseases and affect the muscle, has been identified. Therefore, the diagnosis is made sure through genetic tests, with the presence of a family history and suspicion of the clinical picture. In cases where the genetic cause is not clear, muscle biopsies, deviation of some muscle enzymes in the blood, (EMG) and electromyography studies in polyneuropathies are the main methods used together with the clinical table.

b. **Educational Diagnostics:** Some of the children with neuromuscular disease may have mental problems. Some of the children with Duchenne Musküker Dystrophies are known to have below-average intelligence, learning difficulties such as dyslexia and attention deficit disorders. Learning difficulties may accompany some types of congenital muscular dystrophy affecting the central nervous system in NMD.

ATTENTION: Neuromuscular diseases generally show a progressive characteristic. The main goal in education, physiotherapy and rehabilitation approaches should be to preserve the current capacity.

Treatment Processes

Although there are important developments in the treatment of NMD, most of them do not have a definitive treatment yet. Today, we can gather treatment approaches under 3 headings. These approaches are continued by complementing each other.

1. Medication treatments
2. Physiotherapy and Rehabilitation
3. Surgical approaches

1. Medication Treatments

Glucocorticoid treatments are beneficial in the Duchenne Muscular Dystrophy group. It has been proven both to protect respiratory and muscle functions, and prolong walking time by 2 years and prevent scoliosis.

Currently, supports such as Co-enzyem Q10, carnitine, creatine can be recommended to support the muscle, on the condition that age groups are taken into consideration.

2. Physiotherapy and Rehabilitation

Rehabilitation practices include patient-specific medical and physical treatment programs, home program and recommendations, family training, home and environmental arrangements, surgical interventions planned according to the needs, as well as orthoses, auxiliary devices and equipment planned for the patient.

The purpose of physiotherapy rehabilitation approaches in NMD; is to increase the quality of life of the patient and his/her family. Practices performed for this include:

4. To preserve muscle strength or delaying loss of strength,
5. To prevent shortness of the muscles and deterioration in joints,
6. To prevent respiratory problems,
7. To continue walking activity as long as possible,
8. Educating the family,
9. To support, protect and increase the function of the joint at different stages of the disease,
10. To increase functional capacity,
11. To select, evaluate and train various rehabilitation technologies in order to increase the quality of life and functions.

In order for physiotherapy rehabilitation practices to be successful, the patient should be evaluated in detail and the treatment program should be planned according to the functional capacity, problems and needs of the patient.

Common feature of neuromuscular diseases is that; during daily life activities, especially in low-intensity activities such as dressing and walking, they get tired quickly, stay immobile for a long time, have falling anxiety and worry about moving.

One of the most important effects of exercise therapies, which is one of the basic approaches of physiotherapy practices, is to release the healing proteins on the muscle and protect the muscle. In addition, it has very important effects on increasing circulation, preventing deformities, improving respiration, protecting and improving general health. However, the quality, intensity and purpose of the exercise program should be planned by the physiotherapist. Physiotherapists reach a conclusion by evaluating the course of the disease, the child's condition and normal development characteristics, exercise tolerance and needs and plan the exercise program. Home program recommendations are developed to increase the effectiveness of exercise therapy. Practicing regularly the exercises recommended by the physiotherapist at home together with family education will increase the level of benefit of the child. Making exercise programs fun for the child will increase their motivation [12].

Physical activity habits should be developed and supported in children with NMD. Maintaining daily life activities is the most important physical activity. It should be ensured that the child is independent with the least physical support possible in accordance with his situation and avoiding excessive force.

Muscle testing to be performed by a physiotherapist is important in evaluating the affected muscles objectively and determining appropriate strengthening and exercise training. In addition, repetition of these tests should be used to measure strength gain and program effectiveness [13, 14].

As the child will have difficulty in doing exercises in the middle period when the limitation increases significantly, active-assisted normal joint movement (NJM) and stretching exercises to be performed by hands are considered to be appropriate. Knee-ankle-foot orthosis (KAFO) is preferred to maintain standing or limited ambulation during late ambulation (mobility) or early non-ambulation (inability to move) period.

Fighting against scoliosis (spinal curvature) in the late period when the patient is able to stand with support and is dependent on a wheelchair constitutes an important part of rehabilitation.

Keeping the spine in a neutral (physiologically required) or slightly prolonged position can delay scoliosis. In addition, scoliosis orthoses have also been proven to prevent progression of scoliosis. Spine surgeries are applied to reduce pain, protect respiratory functions and prevent worsening of spinal deformity. During this period, active exercises should be included in the program to protect upper extremity functions. Stretching exercises should be added for shoulder flexion and abduction (lifting the arm upwards on the side of the body), elbow, wrist and finger extensor (straightening/erectness in one joint) or resting splint can be used for the hand and wrist. Most patients have difficulty changing position in bed and need to be turned over at night. Positioning exercises are effective in preventing bedsores and providing quality sleep [15].

3. Surgery Practices: Orthopedic surgical approaches can be used to fight against joint deformities and scoliosis in NMD. The purpose of such approaches is to increase the patient's quality of life and support function. Orthopedists working in the field of neuromuscular diseases perform surgical practices in suitable NMD children through multidisciplinary evaluation. Physiotherapy and rehabilitation practices should be started from the preoperative period in order to prepare the child for the postoperative period and to maintain post-surgical functional gains.

New developing medical treatments [16]

Gene therapy: Studies are going on to complete the missing gene. Trial works have already been started for DMD and SMA. It is a form of treatment that is still in the trial phase. Gene therapy is also being studied for some congenital muscular dystrophies.

Exon skipping: It is the re-realization of protein synthesis by removing the faulty exon. It will be able to be applied to some patients with DMD. Although there is no definitive treatment, it alleviates clinical findings. Trials for exons 51, 53 and 45 are ongoing.

Ataluren was developed for DMD patients with a genetically nonsense mutation. Approximately 15% of patients with DMD have a nonsense mutation. This medicine is for these children and is a medicine that has been approved in our country.

Tamoxifen: Its effect has been proven to prevent damage in muscle tissue and reduce muscle breakdown. Families are trying this medicine in Turkey and other countries (Israel, Greece, England) despite the lack of definitive data obtained. It is a situation that needs to be scientifically proven.

Other medication treatments: There are also some medication studies developed to prevent some biochemical reactions that develop in muscle tissue and damage the tissue.

Spinal Muscular Atrophy

Nusinersen: It is a spinal medication that requires continuous use with SMA patients. The aim is to provide the protein produced by the missing gene. It has been proven to be more effective when applied early.

Risdiplam: It is also intended to complete the missing gene, like the Nusinersen medication. Studies are still in progress. It is expected to be successful.

Neuromuscular diseases are a very large group of diseases and have inherited characteristics. Deformities in the joint and spine and respiratory problems accompanying progressive muscle weakness lead to functional deficiencies in various degrees. Despite the important progress in recent years, there is no radical treatment for these diseases. In addition to some supportive medication treatments, physiotherapy and rehabilitation approaches are extremely important. Home exercise practices are necessary for the protection of general health, muscles and joints, blood circulation and maintenance of functions. For this reason, family trainings are among the main duties of physiotherapists. Families should be part of the rehabilitation team.

Expectations and hopes have increased in recent years about the treatment of NMD. However, studies agree that the treatments carried out in the early stages give more positive results. Therefore, the protection of children's functional levels depends on a good physiotherapy and rehabilitation program and cooperation with the family.

BOOK: To learn more about Neuromuscular Diseases and their treatment, check out the book "Bülent Elbasan [Editor] (2019). Pediatrik Fizyoterapi ve Rehabilitasyon. İstanbul Tıp Kitabevi, İstanbul."

For more information about the treatment of Neuromuscular Diseases and family education; you may visit https://treat-nmd.org/wp-content/uploads/2016/09/Turkish-dmdmdffg_turkish-131.pdf and https://www.noromuskuler.org.tr

DEGENERATIVE, NEUROMETABOLIC AND GENETIC ORIGIN DISEASES AFFECTING THE CENTRAL NERVOUS SYSTEM

Neurometabolic diseases are an important group of diseases mostly seen in newborns and infants. Common neurological symptoms and signs, especially seizures, are observed in these disease groups. The onset of symptoms occurs after normal or near-normal growth and development.

After the age of 1-2, a regress may be observed with children in learning motor and mental skills. In older babies, enlargement of the spleen and liver, skeletal abnormalities and uncontrolled seizures can also be observed. Children with signs of ataxia (balance disorder) may show abnormal gait, decreased mental function, abnormal behavior and sleep disorders. Abnormal tone, spasticity or hypotonia may occur during neurological examination. In addition to these, vision loss, attention loss, speech impairment and cerebellar disorder are observed in children. Phenylketonuria, Menkes Disease, Propionic Acidemia, Carbohydrate Metabolism Disorders, Mitochondrial Disorders, Cerebrohepatorenal Syndromes, Lysosomal Diseases are in this group [17].

How is Neurometabolic Disease Diagnosed?

After these patients are evaluated in detail by pediatric neurologists and pediatric metabolic doctors, it is necessary to screen the disease groups that are most considered by clinical findings, and necessary blood, urine and cerebrospinal fluid analysis and muscle biopsy should be performed.

Physiotherapy and Rehabilitation in Neurometabolic Diseases [17]

Physiotherapy and rehabilitation practices in neurometabolic diseases include the followings:

- Preserving and increasing muscle strength
- Protecting and increasing the joint range of motion
- Maintaining balance and coordination
- Regulation of muscle tone
- Preserving posture and preventing scoliosis
- Improving cardiorespiratory (heart and respiratory system) function and endurance
- Preserving functional mobility and providing transfers appropriate to the capacity of the individual
- Preservation and development of walking and locomotion skills

- Increasing and/or preserving daily life activities
- Ensuring energy conservation and preventing fatigue during activities
- Ensuring the use of auxiliary tools, devices and equipment
- Family Education
- Preservation and development of neurocognitive functions
- Designing orthoses and various adaptive devices private for the individual and providing training

Understanding the natural process and characteristics of rare diseases such as neurometabolic diseases is very important for physiotherapists. It is also important to know how disorders and activity limitations change the course of medical practices or other treatments. While the physiotherapist organizes the child's home environment, educates the family and the school environment on appropriate activities. It shapes the treatment and improves the function by making the necessary arrangements around the home and school, taking into account the medical condition and needs of the child.

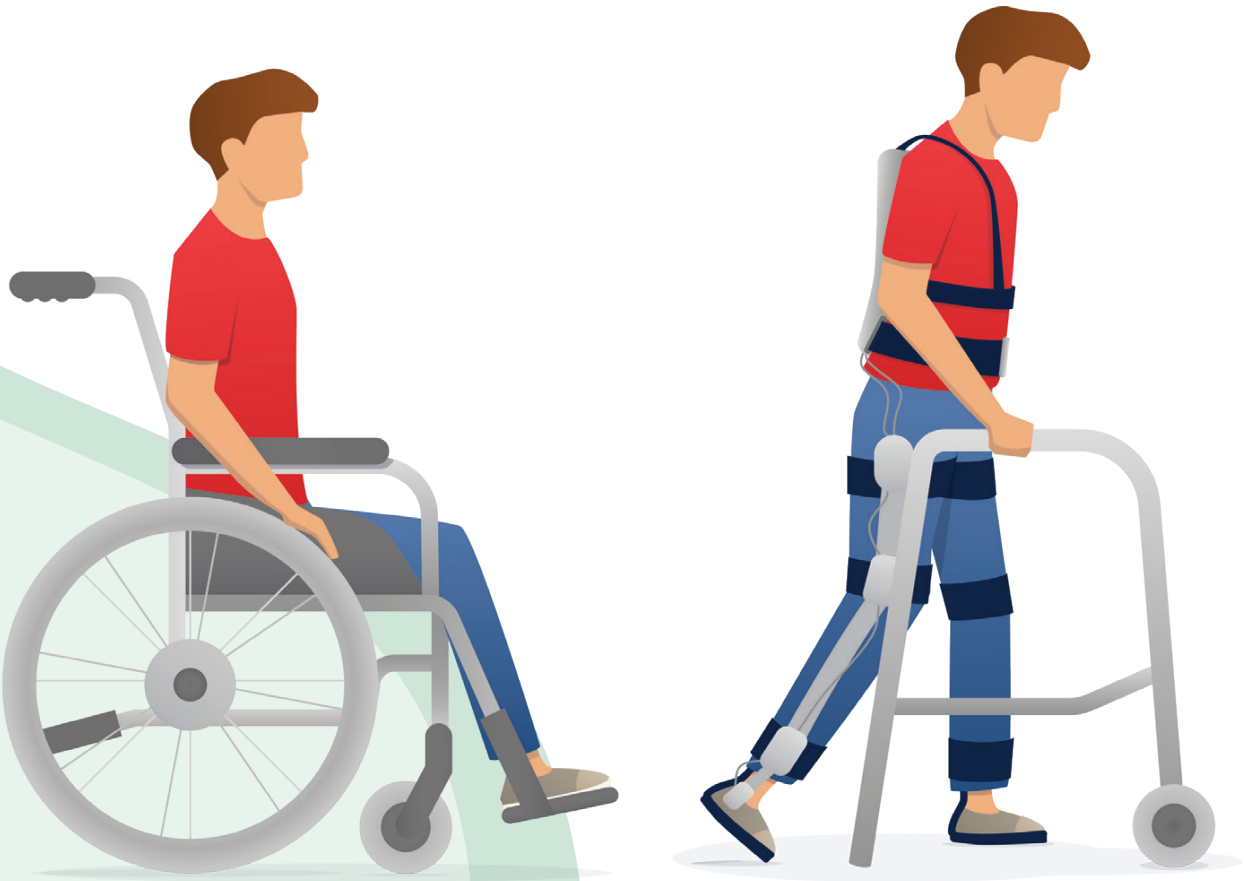
EDUCATIONAL EVALUATION AND DIAGNOSIS PROCESS IN INDIVIDUALS WITH PHYSICAL DISABILITY

Often used as a synonym for testing, the concept of evaluation is a complex and multifaceted process that includes testing. When it comes to evaluating students with special needs, evaluation should be seen as a process that is done for different purposes and where methods, materials and tools differ according to the purpose, rather than seeing it as a process limited to a certain place and time.

The educational evaluation and diagnosis process requires the acquisition of information that will serve to make effective decisions about the individual's development and academic characteristics. In this process, the student's competencies, disabilities and learning needs should be evaluated in detail [18, 19].

In the evaluation made by the Educational Evaluation Board formed in Counseling and Research Centers (RAM), it is decided to;

- Determine the special education needs of the individual
- Whether he/she will benefit from special education and rehabilitation centers,
- Prepare the education plan to be created for the individual
- Whether the individual has made sufficient progress at the proposed support training program.
- Whether he/she benefits from education and training activities in line with their needs and competencies.



LEGAL RIGHTS

There are many national and international legal rights, particularly defined by the United Nations Convention on the Rights of Persons with Disabilities for individuals with special education needs, the Constitution of Turkey and Law on the Disabled People. Legislative arrangements prepared by various institutions and organizations for individuals with special education needs are based on these legal rights.

Who is entitled to benefit from the legal rights?

To benefit from these rights in our country; the individual must prove that he/she has at least 40% disability by a report received from a hospital authorized by the Ministry of Health to issue a disabled health committee report, or as per the Regulation on Special Needs Assessment for Children (ÇÖZGER) published on February 20, 2019, the disability rate is not written in the reports of children, but a statement such as “special requirement exists (ÖGV)” must be included in the report.

Educational Rights

Education rights of individuals with special education needs cannot be prevented on any grounds. The compulsory education age of individuals who are determined to have special education needs starts from 36 months. Considering the development and characteristics of the children, the education period can be extended in the pre-school period. Although it is essential for individuals with special education needs to continue their education through harmonization/integration of all types and levels throughout the compulsory education period, they can also benefit from special education schools or special education classes opened for these individuals. Moreover;

- Early childhood education service for 0-36 months children with special education needs,
- Homeschooling service for students at the age of compulsory education who certify that they cannot benefit from formal education institutions for at least twelve weeks due to health problems or that they will pose a risk to their health if they do,

- Education service in classrooms opened within hospitals for students who are in need of special education at the age of compulsory education and who receive inpatient treatment in health institutions due to health problems,
- In order to equip individuals with special education needs with knowledge and skills in professional, technical, social or cultural fields, to bring them to life and to turn them into productive individuals, non-formal education services can be provided to these individuals by public education centers.

How can physical therapy processes be utilized in hospitals?

When the appropriate report is obtained, physically disabled individuals can receive physical therapy and rehabilitation services from hospitals. The conditions regarding the issuance of health reports and the payment of physical therapy and rehabilitation practices by the institution are regulated every year by the Health Implementation Communiqué.

Free school shuttle

Individuals with special education needs, who study in official special education schools, special education classes and non-formal education institutions, are provided free of charge transportation to educational environments.

Lesson exemption

Among the individuals with special education needs; Students with hearing impairment, intellectual disability or autism may be exempted from foreign language lessons of all types and levels, and students with motor impairments can be exempted from practical parts of lessons that require motor skills.

Support training room

For the students who continue their education through full-time inclusion/integration in schools providing education at pre-school, primary and secondary education levels, support education room is established by Provincial or sub-provincial directorates of national education. These students can receive training in support training rooms up to 40% of the total weekly course hours with the decision of the Individualized Education Plan (BEP) Development Unit established within the schools.

Supplementary education

Supplementary education activities can be organized for 2 lesson hours per week, except for formal education hours, for students with special education needs studying in official special education schools.

Exam measure services

At the central system exams, which the individuals with special education needs will take, exam measures suitable for the disabilities of the individuals can be taken by counseling and research centers.

University exam application

In order to make arrangements such as additional time, reader, marker support for students suitable with their disability status, students are required to submit their disabled health board reports to ÖSYM registration offices at the application stage.

In addition to the education rights of individuals with special education needs; they also have rights in areas such as public services, health, tax exemption and deduction, employment, working life, social security, social assistance, employees with disabled children/relatives. You can use the following web addresses and contact numbers to get detailed information about the rights in question.

- https://khgmcalisanhaklaridb.saglik.gov.tr/TR,54457/engelli-haklari-rehberi.html
- https://www.ailevecalisma.gov.tr/tr-tr/sss/engelli-ve-yasli-hizmetleri-genel-mudurlugu/
- https://ailevecalisma.gov.tr/media/19199/engelli-bilgilendirme.pdf
- Social Services ALO 183
- Social Benefits ALO 144
- Ministry of National Education ALO MEBİM 444 0632

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INDIVIDUALS WITH PHYSICAL DISABILITY

"A Guide for Families"

Individuals with Physical Disability are the people who have limited physical abilities as a result of disorders in the skeleton (bone), muscle and nervous system due to any reason before, during and after birth, or lost their physical abilities to various degrees, who have difficulties for adopt to social life and provide their needs in daily life, for this reason, who needs protection, care, rehabilitation, counseling and support services for these reasons. Weight level of the emerging clinical picture varies depending on the degree of brain, nerves, musculoskeletal system affected, the location and severity of the damage and the age of the individual.

The deficiencies in the musculoskeletal system that occur with the growth significantly limit the performance of the individual in due course. For this reason, it is important to diagnose individuals with physical disabilities in the early period and to evaluate them in terms of educational and rehabilitation. After the diagnosis and evaluation process, it is also necessary for the individual to be supported by a transdisciplinary team at the earliest in terms of physical, cognitive, psychological, social and emotional aspects for the individual to participate in independent life.

The support given between the ages of 0-3, when brain development is the fastest, can provide a rapid recovery and also contributes to keeping the problems that may arise at a minimum level.

Özel Eğitim ve
Rehberlik Hizmetleri
Genel Müdürlüğü