NEUROREHABILITATION IN NEWBORN INFANTS WITH POST-PARTUM PARESIS OF THE BRACHIALIS PLEXUS

Lence Nikolovska
Faculty of Medical Sciences, Goce Delcev University, Stip,
lence.nikolovska@ugd.edu.mk

Arben Hudi

Faculty of Medical Sciences, Goce Delcev University, Stip,
arben.211420@ugd.edu.mk

Abstract

The brachial plexus is a group of nerve roots that are localized in the shoulder and upper arm area. This network of nerve tissue stimulates the nerves providing control of movement and sensation throughout the hand. Brachial plexus paresis is a lesion of the nerve plexus of the shoulder. Congenital plexus brachialis paresis is an injury to the shoulder during birth. The most common cause of brachial plexus paresis is trauma. It occurs with shoulder dislocation, ligament strain, tendon damage, or clavicle fracture. Another reason is the occurrence of ischemia due to compression of nerve fibers during long-term holding of the arm in an unfavorable position

The aim of the research is: to determine the effectiveness of neurorehabilitation methods in newborns with congenital brachial plexus paresis.

Research methods: The research was conducted in Clinical Hospital - Tetovo, at the Department of Physical Therapy and Neurorehabilitation, over a period of 3 months, from the From the beginning of March to the end of May 2023.

Results: Physiotherapy rehabilitation, has been shown to be effective in reducing pain and weakness, as well as in regaining muscle trophism and functional status. Outcomes in most patients with brachial plexitis are improved.

Conclusion: Physical therapy has a major role in treatment and achieving the final result at the end of the entire treatment process. Full recovery of the brachial plexus is achieved by physical rehabilitation.

Key words: brachial plexus, paresis, physical therapy, rehabilitation, kinesitherapy, exercises
Field: Medical Sciences

1. INTRODUCTION

Brachial plexus paresis is a lesion of the nerve plexus of the shoulder. It is manifested by pain combined with motor, sensory and vegetative disorders of the injured arm and shoulder girdle. The clinical picture varies depending on the cause and degree of involvement. The most significant symptom is pain in the region of the collarbone and shoulder, which spreads along the entire length of the arm. Swelling may appear due to impaired nutrition of the structures of the hand. Depending on the injury of the nerve branches and roots, a broad clinical-anatomical classification has been made. Congenital shoulder trauma has 6 forms:

1. Proximal type (C5, C6); **2.** Proximal + middle (S5, S6, S7); **3.** Intermediate type (C7);

4. Middle + distal (C7, C8, TH1); **5.** Distal type (C6, TH1); **6.** Total type (C5, 6,7, 8, TH1).

1.1. Diagnosis

The diagnosis is made immediately after birth. The type of brachial plexus is determined by the child's clinical symptoms. If necessary, electrodiagnosis is applied to examine the electrical activity of muscles and nerves, which includes. Electromyography (EMG), electroneurography (ENG), MRI, myelography (or CT myelogram), and X-ray of the chest. Treatment of brachial plexus paresis is a long-term process.For the correct treatment of brachial plexus paresis, it is necessary to make a correct diagnosis. Neurologists, traumatologists - orthopedists, physiatrists and rheumatologists are involved in the treatment of brachial plexus paresis.

According to the American Academy of Family Physicians, the first aspect of treating plexitis is pain management. For this purpose, painkillers such as analgesics or narcotic drugs are prescribed for extremely severe pain. As brachial plexus paresis progresses, muscle weakness appears. Physical therapy is of great importance for maintaining muscle activity. Sometimes, brachial plexus paresis can cause severe weakness of the deltoid muscle, which is one of the largest muscles in the shoulder. In that case, arm splinting is applied to prevent shoulder dislocation. According to research, a complete cure and restoration of the function of the plexus brachialis is possible only in the first year of the appearance of the disease, provided that the cause is removed and appropriate rehabilitation therapy is carried out.

1.2. Treatment of brachial plexus paresis

Treatment of brachial plexus paresis include: physical therapy, corrective positions, passive and active kinesiotherapy exercises, Range of motion exercises, ocupational therapy, thermotherapy, hydrotherapy. When the child is awake, the hand is left free, to facilitate the emergence and development of spontaneous movements. Passive exercises make it possible to achieve a balance in the tone of the affected and healthy muscle groups and prevent the formation of contractures in the shoulder joint. The affected hand is placed in a longette, which covers the fingers, the palm, the wrist to the middle of the forearm, placed in 90˚upper arm abduction and 90˚elbow flexion.

Reflex exercises to stimulate movements in the child, with specific stimulation, stimulation of the Vojta crawling reflex, as well as application of innate unconditional reflexes for proprioceptive stimulation of the affected hand

The aim of the treatment is .

• Restoring the function of the affected limb to the maximum possible extent;

• Restoration of sensory and motor control;

• Maintaining and increasing the range of motion;

• Increase in muscle strength;

• Stimulating the child's participation in different types of activities;

• Prevention of secondary complications;

2. RESEARCH METHODS

The research was conducted in Clinical Hospital - Tetovo, at the Department of Physical Therapy and Neurorehabilitation, over a period of 3 months, from the From the beginning of March to the end of May 2023. **The research included 9** patients with post-partial paresis of the brachial plexus aged 0 to 1.5 years. 3 patients have left-sided paresis, and the remaining 6 patients have right-sided brachial plexus paresis. According to the gender structure, 4 participants are male and 5 are female.

Table 1. Classification of patients according to gender structure

Gender structure	Number of patients	Percentages
Male	4	44,5%
Female	5	55,5%
In total	9	100%

Table 2. Classification of patients according to birth weight

Body weight at birth	Number of patients	Male	Female	Percentages
Over 3500 grams	4	3	2	60 %
Under3500 grams	5	6	7	40 %
In total	9	9	9	100

Table 3. Classification of patients according to the type of paralysis

A type of paralysis	Number of patients	Male	Female	Проценти
I – Erb - Duchen	5	2	3	55,5 %
II-so-called "expanded" type I	3	1	2	33,4 %
III--Klumpke-Dejerine	1	1	/	11,1
IV– total brachial plexus lesion	/	/	/	0%

In the beginning, to all patients is applied thermotherapy (infrared light, solux) in the shoulder and arm area, for a duration of 5 minutes, which gradually increases to 20 minutes. Paraffin applications are placed in the area above and below the concave part of the clavicle, the front and back half of the chest, with a temperature of 38 - 40 degrees Celsius, for a duration of 30 minutes.

To remove the functional blockage, caused by paresis of the brachial plexus in patients from the First Group electrostimulations with low-frequency exponential

currents are applied in the area of the motor points. Electrical stimulations are applied for 5 - 10 days. In the case of neuropraxia, a low frequency (0.25-0.5 Hz.) is used.

In patients from the Second Group, Functional Magnetic Stimulation (FMS) is applied to the affected muscles for a duration of 15 to 20 minutes, over a day for a period of 2 to 3 weeks.

3. RESULTS: Physiotherapy rehabilitation, which include passive and active kinesiotherapy exercises, transcutaneous electrical nerve stimulation, and/or functional electric stimulation, has been shown to be effective in reducing pain and weakness, as well as in regaining muscle trophism and functional status. Outcomes in most patients with brachial plexitis are improved**. After summarizing the results** of the treatment of the patients in both groups, significantly better results can be observed in the patients of the Second Group in which Functional Magnetic Therapy is applied, compared to the electrical nerve stimulation that was included in the patients of the First Group.

4. DISCUSSION

Treatment of brachial plexus paresis is a long process in which the arm remains partially or completely unable to move. As a result, muscle atrophy, limited movement, dystrophic changes in the joints due to reduced production of joint fluids. Positional treatment reduces the risk of complications and creates a favorable static load on the muscles of the affected arm.

5. CONCLUSION: Functional magnetic stimulation acts on deep-seated muscles and causes quality and maximum contraction. This type of contraction allows the muscles to work at 100% of their strength, which is not possible with conventional exercise or passive gymnastics. The achieved results are visible in a few weeks. Physical therapy has a major role in treatment and achieving the final result at the end of the entire treatment process and represents a link that connects drug treatment and kinesitherapy.

6. REFERENCES

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