



# Physiotherapy Intervention According to the Bobath Concept in a Clinical Case of Cerebral Palsy



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## Abstract

Cerebral Palsy (CP), according to Richards & Malouin [1], consists of chronic non-progressive encephalopathy resulting from a Central Nervous System (CNS) lesion manifested by disorders of movement, posture, balance and coordination, with the variable presence of voluntary movements. Some rehabilitation approaches that have been used in CP rehabilitation are the Bobath Concept, the task-specific training, and the family-centered approach. The aim of this study was to verify the influence of the physiotherapy intervention according to the neuro developmental techniques according to the Bobath concept, in the improvement of global motor skills in a 36-month-old child with bilateral spastic cerebral palsy. For this purpose, the Gross Motor Function Measure (GMFM) evaluation scale was applied pre and post test (2 times a week for 12 weeks) and the main problems of the child according to the International Classification of Functionality (ICF) were classified. The results after the intervention, in which the same measurement and evaluation instruments were used, according to GMFM, showed a slight evolution, with child's gross motor capacities at the 18-month level. In overall terms, there is improvement in all components of the ICF, which is more marked in activities. After analyzing this case the results obtained were positive although they were not reached in their fullness.

**Keywords:** Physiotherapy intervention; Cerebral palsy; Bobath concept; Gross motor function measure; International classification of functionality

**Abbreviations:** CP: Cerebral Palsy; CNS: Central Nervous System; GMFM: Gross Motor Function Measure; ICF: International Classification of Functionality; NDT: NeuroDevelopment Techniques

## Introduction

Cerebral Palsy (CP), according to Richards & Malouin [1], consists of chronic non-progressive encephalopathy resulting from a Central Nervous System (CNS) lesion manifested by disorders of movement, posture, balance and coordination, with the variable presence of voluntary movements. It can be said that this is a static encephalopathy in which the primary lesion is not progressive; however, the clinical presentation pattern may change over time due to the growth and development of CNS maturation and plasticity [2].

The movement disorders present in CP are clinically characterized by upper motor neuron damage with changes in cortical circuits and absence of adequate sensor-motor control mechanisms. The motor cortex projections for the spinal motoneurons are altered, which causes difficulties in voluntary movement [1]. One of the most common features is spasticity, a sensorimotor control disorder resulting from upper motor neuron injury. It is manifested by an increase of the reflex of passive muscle stretching, which intensifies with the speed of movement, that is, there is an inappropriate and excessive involuntary muscular activation. Spasticity is a dysfunction that can cause limitations

of ADLs, such as walking, bathing, dressing, transfer and sitting / lifting difficulties. Other musculoskeletal consequences may also occur over time such as pain, deformities and dislocations [3,4].

It is important to consider child neuropsychomotor development insofar as delays of this can be prolonged until adulthood. With regard to intervention, it has shown more benefits for children when the therapist's performance is associated with parental involvement [5]. Some rehabilitation approaches that have been used in CP rehabilitation are the Bobath Concept, the task-specific training, and the family-centered approach [1]. The most recent approaches shift the focus from disability intervention to promoting children's independence and participation [6].

## Case Presentation

The present case is a 3-year-old male, with spastic paraparesis and delayed motor development. The child moves essentially on a cat and cannot walk alone, getting the activity with support but with much instability. To move around at home and in preschool often uses a previous walker. It also presents difficulties in some daily life activities (DLAs), such as dressing / undressing, underwear and bathing, in which the child tries to collaborate but does not perform

the activity autonomously. The expectations of the child and the family for the intervention are to enable the child to be able to move alone and to be more autonomous in the DLAs.

The evaluation includes the collection of clinical and subjective data and the application of tests [7]. For this purpose, the Gross Motor Function Measure (GMFM) evaluation scale was applied pre and post test (2 times a week for 12 weeks) and the main problems of the child according to the International Classification of Functionality (ICF) were classified, according to the clinical process and the survey of family needs and expectations (perspective of the condition, problems, expectations and contextual factors).

Considering the clinical condition of the patient resulting from a hypoxic ischemic PC injury, resulting in difficulties in postural control, balancing ability and intersegmental coordination, the intervention was developed with a view to the development of this same postural control, with the aim of improving the ability to balance and coordinate, ie through the transmission of stimuli to the CNS. An important factor to take into account in the intervention in these cases is the development of stabilization exercises of the trunk and the proximal muscles [8].

Rotta et al. [9] states that the different methods used in Physical Therapy are used according to the clinical picture, and the most commonly used approach to Neurodevelopment Techniques (NDT) is the Bobath Concept. Some of the studies [10,11] have shown that

**Table 1:** Pre and post test results according to GMFM and ICF.

Measured Instrument	Domain	Pre-Test	Purpose	Post-Test
GMFM	A. Decubits and rotate	96,1%	100%	100%
	B. Sit	95%	100%	98,3%
	C. Crawling and kneeling	85,7%	Maintain or improve	92,9%
	D. Standing position	56,4%	75%	61,5%
	E. Walking, running, and jumping	19,4%	40%	20,8%
	Total	70,52%	75%	75%
ICF	Joint mobility functions	b710.2	b710.1	b710.1
	Trunk muscle tone	b7355.3	b7355.2	b7355.3
	Crouch down	d4101.3	d4101.1	d4101.1
	Sit down	d4103.2	d4103.1	d4103.1
	Stand up	d4104.3	d4104.1	d4104.1
	Stand up	d4154.2	d4154.1	d4154.1
	Wash up	d510.2	d510.1	d510.2
	Dress-up/shorts	d540.3	d540.1	d540.1
	Products and technologies for personal use in daily life	e115.2	e115.+1	e115.+1
	Personal care providers and personal assistants	e340.+2	e340.+3	e340.+3

After analyzing this case the results obtained were positive although they were not reached in their fullness. Regarding the intervention of Physiotherapy in the CP are several studies and

the approach to TND of the Bobath concept is effective in improving motor performance measures in children with CP, especially in global motor skills, postural control, and stability. Molenaers et al. [12] state that only studies using NDT seem to demonstrate a trend of efficacy at all levels of ICF.

### Results and Discussion

GMFM is an instrument that assesses gross motor function, important for the child's functional performance, and is primarily intended for children with CP. Studies indicate that it allows to better target the objectives of the intervention as well as to determine the most appropriate techniques. The present case is classified as Level III, that is, it is using an auxiliary locomotion device. At the baseline, the results of GMFM showed a moderate delay in motor development, since gross motor capacities place the child between 12 and 18 months, when in fact 36 months. Despite the advantages of its use, the GMFM does not measure the quality of the child's activities, so the association with the ICF allows this to be addressed [7,13,14].

The results after the intervention, in which the same measurement and evaluation instruments were used, according to GMFM, showed a slight evolution, with child's gross motor capacities at the 18-month level. In overall terms, there is improvement in all components of the ICF, which is more marked in activities (Table 1).

techniques pointed out in the literature as beneficial, however, almost all the studies refer to the need for more research and quality [1,8,9,15-19].

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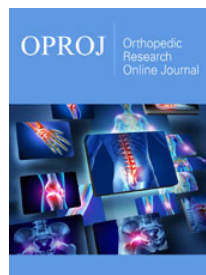
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