



Effects of a PediaSuit adapted protocol in the motor function of children with cerebral palsy

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Abstract The purpose of this study was to verify if the PediaSuit Method in a semi-intensive adapted format is effective to increase the motor function of children with Cerebral Palsy (CP). A longitudinal study in which eight children with CP was classified by the Gross Motor Function Classification System (GMFCS) and underwent the gross motor function assessment using the Gross Motor Function Measure (GMFM) before the intervention with the PediaSuit Method. This method was adapted, where the children wore the suit once a week, during three hours, but followed in a period of four months. This adaptation was made to complete the 80 hours of intervention with the method, required by the traditional configuration. After this semi-intensive follow-up, the children were assessed again through the GMFM. The GMFCS showed that 75% of the sample had score III, and the other 25% divided into II and IV, 12,5% each. Even the raw score showing increase in every section of the GMFM, there was no statistic difference between the assessment before and after the intervention according to the Student's t-Test (lying and rolling ($p=0,16$), sitting ($p=0,15$), crawling and kneeling ($p=0,09$), standing, walking ($p=0,44$), running and jumping ($p=0,39$)). There are some quality-based benefits about this semi-intensive adapted protocol of the PediaSuit Method. However, the classic application of the method in a short and intensive period seems to bring more benefits to the motor repertoire of the children with CP.

Keywords Cerebral palsy, dynamic elastomeric fabric orthosis, orthosis, suit therapy.

Introduction

Children with CP need a rehabilitation program that is adequate to all their needs, recovering their functional independence and, for this, gaining muscular strength, stability, selective motor control, improvement of postural control and functional mobility. The Pediasuit Method (PM) is an intensive treatment protocol that uses as a main tool a dynamic and proprioceptive orthosis, used as a whole-body garment, indicated for individuals with neuromotor dysfunctions. Due to the intensive nature, it suggests great motor gains in subjects with CP when compared to conventional physical therapy. The purpose of this study was to verify if the Pediasuit Method in a semi-intensive adapted format is effective to increase the motor function of children with Cerebral Palsy.

Methods

Longitudinal study in which children with CP was classified by the Gross Motor Function Classification System (GMFCS) and underwent the gross motor function assessment using the Gross Motor Function Measure (GMFM) before the intervention with the PediaSuit Method. The PediaSuit Method is described by an intensive intervention, where the child is attended in all therapies wearing the suit five times a week, during three hours, in a period of one month. Meanwhile, this intervention was adapted to the therapy wearing the suit once a week, during three hours, but followed in a period of four months. This adaptation was made to complete the 80 hours of intervention with the suit, required by the traditional configuration of the method. After this semi-intensive follow-up, the children were assessed again through the GMFM.



Figure 1. Child wearing the Pediasuit orthosis, with suspender waistcoat, shorts, knee pads and shoes. All of these pieces are connected by rubber bands, that corrects the biomechanical alignment and provides resistance.

Results

Eight children composed the sample, all of them with cerebral palsy, in which 75% had spastic diplegia ($n=6$), 12,5% had ataxia ($n=1$), and 12,5% had spastic tetraparesis ($n=1$). The mean age was 6,12 years old, where the youngest was 3 and the oldest was 10. About the classification of the motor commitment, the GMFCS showed that 75% of the sample had score III ($n=6$), and the other 25% divided into II and IV, 12,5% each ($n=1$ each). The motor function, assessed before and after the intervention with the Pediasuit Method showed that the raw score had an increase in every section of the GMFM. However, there was no statistic difference between the assessment before and after the intervention according to the Student's t-test: Section A: lying and rolling

($p=0,16$), section B: sitting ($p=0,15$), section C: crawling and kneeling ($p=0,09$), section D: standing, walking ($p=0,44$), section E: running and jumping ($p=0,39$). More details could be observed on Table 1.

Table 1. Mean results and p-value of every section of the GMFM, and the total amount of the sections.

	A	B	C	D	E	Total
First assessment	95,01%	68,05%	34,77%	28,79%	14,53%	50,3%
Second assessment	96,5%	76,36%	50,2%	21,07%	16,27%	57,7
p-value	0,16	0,15	0,09	0,44	0,39%	0,31

Data are raw score of percentage, in which 100% means total score of the section. Section A: lying and rolling, section B: sitting, section C: crawling and kneeling, section D: standing, walking, section E: running and jumping, Total: Total mean of all sections.

Conclusion and discussion

The Pediasuit method provides resistance on the trunk and lower limbs through a dynamic and non-limiting orthosis, and such a tool simulates the force of gravity with more intensity, correcting abnormal movement patterns, and such stimulus applied to the child with neuromotor dysfunction in the intensive or semi-intensive format presents extremely effective results in clinical practice, however, it doesn't show significant differences, probably because of the limited subjects in the sample. The classic application of the method in a short and intensive period seems to bring more benefits to the motor repertoire of the children with CP.

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