

ORIGINAL ARTICLE

CHRONIC PAIN AND PHYSICAL THERAPY IN CHILDREN WITH PARALYTIC SYNDROMES: ARE THERE ANY CHANGES DURING LOCKDOWN?

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ABSTRACT

The aim: To evaluate an influence of physical therapy on chronic pain in children with paralytic's syndrome and to maternal emotional status on lockdown time during the COVID-19 pandemic.

Materials and methods: Data from 96 children and their mothers (96 persons) were included in the study. On-site services of physical therapists before the pandemic (2018-2019) were received by 64 children and by 32 children during quarantine measures due to COVID-19 pandemic (2020). The age of the children ranged from 1 to 6 years, the median age was 3 years and 3 months.

Results: We note that there were more boys with paralytic syndromes. Among the leading paralytic syndromes, the most common was spastic tetraparesis. The frequency of children with level III–V motor disorders prevailed.

Conclusions: The authors consider that physical rehabilitation in children with paralytic syndromes reduces the incidence of moderate chronic pain and improves the emotional state of parents. But, these changes do not occur during the pandemic.

KEY WORDS: children, physical therapy, chronic pain, Covid-19 pandemic, paralytic's syndrome

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INTRODUCTION

Pain assessment and management are important components of pediatric care [1]. It affects various aspects of a child's and family's life, such as sleep, emotional state, social relationships, development and is usually caused by muscle spasticity, contractures, vertebral deformities, bedsores or skin macerations, hypersalivation and/or hyperproduction of bronchial secretions, tube feeding, tracheostomy, gastrostomy, colostomy, seizures, lesions of the central and peripheral nervous system [2]. The clinical assessment of pain is usually challenging in nonverbal children. Therefore, we use the pain assessment tools in a daily practice. [3, 4].

The current strategy for the treatment of chronic pain in children with paralytic syndromes and neurological lesions, defined by the WHO recommendations in 2012 [5]. These recommendations provide a multimodal approach of analgesia for the chronic pain treatment, including the widespread use of non-pharmacological methods and pharmacological therapy [6, 7].

Maternal emotional state is another important aspect that effects on the pain syndrome in children. The recent studies show that parents of children with paralytic syndromes experience chronic stress due to an incurable

disease in a child. Therefore, not only the optimization of maternal physical and psychological health helps in stress management, but their involvement in active physical therapy may reduce anxiety, gives confidence, improves emotional state [8].

Significant lifestyle adjustments in the general population of children and adults have been made by the COVID-19 pandemic, which is associated with psychological problems [9]. Families of children with special needs remain a particularly vulnerable group. The American Academy of Pediatrics (AAP) provides information on caring for children and youth with special health care needs during the COVID-19 pandemic [10]. Health and/or education systems can provide services such as physical, occupational, speech, and other treatments as recommended by the AAP. These therapeutical approaches are crucial to children's development and should be continued during a pandemic. And the availability of services is necessary both in the case of personal visits to rehabilitation centers and in virtual therapy, as an alternative [11]. Even though the pandemic lasts about one year, the issue of rehabilitation of children with special needs remains predominantly unresolved [12].

HYPOTHESIS

1) physical therapy effectively influences on the chronic pain relief in children with paralytic syndromes; 2) physical therapy has a positive impact on the emotional status of mothers of children with special needs; 3) the COVID-19 pandemic changes the effects of physical therapy on chronic pain in children with paralytic syndromes and the emotional state of their parents during.

THE AIM

The aim of this work was to evaluate an influence of physical therapy on chronic pain in children with paralytic syndrome and to maternal emotional status on lockdown time during the COVID-19 pandemic.

MATERIALS AND METHODS

STUDY DESIGN AND SETTING

This study is a non-interventional, descriptive, cross-sectional, single-center. The study procedures were conducted at intervals in 2018-2019 (before the COVID-19 pandemic) and in 2020 (during the COVID-19 pandemic and the implementation of quarantine measures). We provided the individual rehab plan to each child, depending on age, motor dysfunction and comorbidities. Pain assessment and questionnaires of children's parents with paralytic syndromes were performed at the beginning of rehabilitation and after 6 months (end-point).

ETHICAL APPROVAL

This study was approved by the Local Ethics Committee (Protocol № 9 from 16 October 2018), which was conducted with the involvement of underage patients and did not include measures that could harm their health and safety. Both parents of the patients were informed about the methods and scope of the study and agreed to their children participation in this research.

SAMPLING

Data from 96 children and their mothers (96 persons) were included in the study. On-site services of physical therapists before the pandemic (2018-2019) were received by 64 (66.6%) children and by 32 children (33.3%) during quarantine measures due to COVID-19 pandemic (2020). The age of the children ranged from 1 to 6 years, the median age was 3 years and 3 months. Inclusion criteria: children 1-6 years old with paralytic syndromes according to ICD-10 (cerebral palsy G80, hemiplegia G81, paraplegia and tetraplegia G82, other paralytic syndromes G83) on the background of CNS damage caused by hypoxia, bleeding, thrombosis, trauma; congenital brain defects. Exclusion criteria: malignant neoplasms; HIV/AIDS; degenerative diseases of the nervous system, demyelinating diseases; chromosomal diseases; orphan diseases; and those who did not consent to participate in the study.

DATA COLLECTION

The research included a detailed evaluation of medical records, including an "Individual Rehabilitation Plan". The Gross Motor Function Classification System (GMFCS) was used to provide a standardized assessment of limitations in gross motor function in patients with paralytic syndromes [3, 4, 6].

The rating scale r-FLACC (Revised - Face, Legs, Activity, Cry, Consolability Scale) was used in children with impaired communication skills, nonverbal children in order to perform the pain measurement. It is freely available on the Internet and is not marked with permission to its use [13]. The scale is based on determining the degree of pain by the sum of points: 0 points - relaxed/comfortable; 1-3 points - mild discomfort; 4-6 points - moderate pain; 7-10 points - severe pain. Pain evaluation on the r-FLACC scale was performed by parents together with a physical therapist.

The parents' interview was conducted using the "Original Questionnaire for Mothers/Legal Representatives (Guardians)" (Copyright №88107, May 2019). It includes five domains: Domain 1 – "Condition of child" (mobility, walking; pain or discomfort; child's ability to calm down; scream baby while feeling pain or discomfort); Domain 2 – "Score of Rehabilitation" (evaluation of the child condition before and after rehabilitation on a scale from 0 to 10, and number of rehabilitation courses, and follow rehabilitation recommendations at home); Domain 3 – "Parenteral emotional state" (anxiety, agitation, sleep and support - 13 items). Each item provided at least three choices: "Most of the time", "Sometimes" or "Almost never". This publication contains the results of the analysis of Domain 3 depending on Domain 1 (item Pain or discomfort).

Since 2020, when the "orange" and "red" quarantine zones for the COVID-19 pandemic were introduced, our institution has implemented online counseling using various platforms at the parents' request (Zoom, Google Meet, Viber, Telegram, FaceTime), as well as distribution of the original questionnaire for parents via e-mail (Google). Physical therapists conducted and completed the "Individual Rehabilitation Plan" together with parents. The physical therapist performed the distance learning and supervision of classes performed by parents at home. At their request, and if the epidemic situation allowed, physical therapists made homebased visits in accordance with the rules of hygiene. Physical therapists were interviewed periodically.

ANALYSIS

Statistical analysis was performed with the programs Statistica 7.0 StatSoft Inc.1984–2004, (Serial Number 1225555555, USA) and MedCalc version 14.8-© 1993-2014 MedCalc Software bvba (Acacialaan 22 B-8400 Ostend, Belgium). Descriptive analysis, comparison of two proportions were used. In-group changes were estimated with the help of frequency tables and crosstabulations function to have an opportunity to connect the frequency

Table I. Demographic and clinical data of the cohort of children with paralytic syndromes

Sign	Before the COVID-19 pandemic n=64 Abs. (%)	During the COVID-19 pandemic n=32 Abs. (%)
Age, Me*	3 years 4 months.	3 years 1 month.
Number of children less than 1 year old	7 (10.9)	3 (9.3)
Number of children between 1 and 3 years old	25 (39.0)	14 (43.7)
Number of children 3 years old or above	32 (50.0)	15 (46.8)
Sex, males.	40 (62.5)	21 (65.6)
Sex, females.	24 (37.5)	11 (34.3)
Congenital pathology of the CNS	32 (50.0)	13 (40.6)
Cerebral palsy	21 (32.8)	10 (31.3)
Other factors of paralytic syndromes	11 (17.1)	9 (28.1)
Spastic tetraparesis	41 (64.0)	16 (50.0)
Spastic paraparesis	8 (12.5)	10 (31.3)
Paraplegia	11 (17.1)	6 (18.7)
Diplegia	4 (6.3)	-
GMFCS I - II	13 (20.3)	-
GMFCS III	9 (14.0)	6 (18.7)
GMFCS IV	12 (18.8)	13 (40.6)
GMFCS V	30 (46.8)	13 (40.6)
Anticonvulsant therapy	26 (40.6)	11 (34.3)

*Note: Me - median

Table II. Characteristics of chronic pain in a cohort of children with paralytic syndromes using the r-FLACC scale

Score	Before the rehabilitation Abs. (%)	After the rehabilitation Abs. (%)	p
Before the pandemic (2018-2019), n=64			
0-3 points	33 (51.5)	53 (82.8)	0.0003
4-6 points	18 (28.1)	8 (12.5)	0.0376
>7 points	13 (20.3)	3 (4.6)	0.0115
During the pandemic (2020), n=32			
0-3 points	22 (68.7)	24 (75.0)	0.5949
4-6 points	4 (12.5)	2 (6.25)	0.3433
>7 points	6 (18.7)	6 (18.7)	1.000

of display of observations at different levels. Logistic regression analysis using relative risk index (RR) and its 95% confidence interval (CI). The difference in parameters was considered statistically significant at $p < 0.05$ by Fisher test and associated P-value with z-statistic.

RESULTS

A thorough study of the life history, assessment of clinical syndromes and movement disorders in all children at the beginning of the study were performed. Demographic and cumulative clinical data are given in table I.

The distribution of children according to demographic data, basic syndromes and movement disorders was homo-

geneous, which was due to the contingent of children who are provided with rehabilitation services in the institution. We note that there were more boys with paralytic syndromes (2018-2019 $p = 0.0076$ and 2020 $p = 0.0129$). Among the leading paralytic syndromes, the most common was spastic tetraparesis (2018-2019 $p = 0.0076$ and 2020 $p = 0.0129$). The frequency of children with level III – V motor disorders prevailed: 51 (79.6%) children in the period 2018-2019 and 100% of children in the period 2020 (2018-2019 $p = 0.0076$ and 2020 $p = 0.0129$). Thus, there was a tendency for parents of children with level I-II movement disorders during the COVID-19 pandemic not to use physical therapy services. This cohort of children was characterized by the fact that 37 (38.5%) children received anticonvulsant therapy.

Table III. Characteristics of chronic pain in a cohort of children with paralytic syndromes according to the subjective assessment of mothers

	Before the rehabilitation Abs. (%)	After the rehabilitation Abs. (%)	p
Before the pandemic (2018-2019), n=64			
Your child does not feel pain or discomfort	8 (12.5)	27 (42.2)	0.0001
Your child feels moderate pain or discomfort	38 (59.4)	22 (34.4)	0.0053
Your child feels severe pain or discomfort	15 (23.4)	12 (18.7)	0.4848
During the pandemic (2020), n=32			
Your child does not feel pain or discomfort	12 (37.5)	13 (40.6)	0.8069
Your child feels moderate pain or discomfort	10 (31.3)	9 (28.1)	0.7933
Your child feels severe pain or discomfort	10 (31.3)	10 (31.3)	1.000

The results of pain assessment of children with mild discomfort (0-3 points) using the r-FLACC scale in a 6-month time interval did not differ significantly before and during the pandemic - 51.5% and 68.7% (p=0.1385) (Table II).

Children who showed severe pain (more than 7 points) were prescribed pharmacological therapy: in the period 2018-2019, 13 (20.3%) children received medication for pain correction, similarly to 6 (18.7%) children involved in the study in 2020 during quarantine measures (nonsteroidal anti-inflammatory drugs, myorelaxants, gabapentin). Among the general cohort of young children with paralytic syndromes who visited our rehabilitation department - 19 (19.8%) had severe pain according to the r-FLACC scale, which required medical correction. All children who showed severe pain were more than 4 years old, had spastic tetraparesis and GMFCS IV-V movement disorders. Severe and moderate pain was registered in 30 (46.8%) children at the beginning of the study in the pre-pandemic period and in 10 (31.2%) children during quarantine measures (RR=1.5; 95% SI 0.87-2.75; p=0.1359).

The number of children with severe pain decreased to 9 (9.3%) from the general cohort after a 6-month interval. But there were no changes in the prevalence of children with severe pain occurred during the pandemic, although the percentage was insignificant. We assume that they need more time than 6 months to relieve pain. In general, severe, and moderate pain in the end-point study was demonstrated by 11 (17.1%) children before the pandemic and 8 (25.0%) children during the pandemic (RR=0.68; 95% SI 0.30-1.53; p=0.3621). Therefore, a such factor as the effect of quarantine measures on reducing pain in children during physical therapy for 6 months can be ruled out.

We noticed that after a 6-month interval of rehabilitation measures, the prevalence of children who had moderate pain and did not receive pharmacological treatment of pain significantly decreased in the period before the pandemic (RR=2.3; 95% SI 1.1-4.7; p=0.0358) and haven't changed during pandemic (RR=2.0; 95% SI 0.4-10.1; p=0.4032).

We found that pain assessment on the r-FLACC scale and subjective assessment of maternal pain (Domain 2 of the questionnaire "chronic pain") were different (Table III).

According to the subjective assessment of chronic pain (moderate and severe) by parents, its frequency was higher

than in the objective study using the r-FLACC scale (Table 2), as in the beginning of the study (RR=1.8; 95% SI 1.4-2.3; p<0.0001) and at the end-point after 6 months (RR=3.2; 95% SI 2.1-4.9; p<0.0001). At the beginning of the study, 53 (82.8%) children had moderate and severe pain according to their mother's opinion, and after 6 months of rehabilitation measures - 44 (68.7%) in 2018-2019; 20 (62.5%) at the beginning of the study and 19 (59.3%) children at the end-point after 6 months of rehabilitation measures in 2020. Thus, a factor such as subjective assessment of maternal pain in children with paralytic syndromes increases the incidence of pain compared to objective assessment.

Because the focus of this study is chronic pain and the hypothesis of the study was that physical therapy is effective in chronic pain relieving in children with paralytic syndromes and positively affects the psychosocial status of mothers of children with special needs, Domain 3 - "Parenteral emotional state" was analyzed in parents, who noted the presence of moderate and severe pain in children, for the analysis of which the cross-stabilization function was used (n=51).

During the period 2018-2019 before the COVID-19 pandemic, after a 6-month rehabilitation course, the "fall asleep due to child health" decreased statistically significantly from 48/51 to 25/51 (RR=1.9; 95% SI 1.4-2.6; p<0.0001), "sleepless nights due to child's condition" from 44/51 to 23/51 (RR=1.9; 95% SI 1.3-2.6; p<0.0001), "intolerable observation of the child's condition" from 46/51 to 20/51 (RR=2.3; 95% SI 1.6-3.2; p<0.0001), "feelings of inner anxiety" from 44/51 to 21/51 (RR=1.9; 95% SI 1.4-2.5; p<0.0001). A significant proportion of these emotional states' parents considered present as "Sometimes". "Most of the time" was characterized by such feelings as "...it is unbearable to watch a child suffering"; "... feeling of helpless or scared when a child was in pain". Such emotional states and needs of parents as "needs talked to anyone who could specifically help", "looking for sympathy or understanding from someone", "concern that a child is receiving pharmacological or non-pharmacological treatment for pain in the last few days", "concern child's ability to lead a normal life in the last few days", "worrying that you have taken too much care of your baby in the last few days", "feeling upset and angry when a child is constantly screaming when in

pain or unable to calm down when in pain” were rated as “Almost never”.

During the period of 2020 during the COVID-19 pandemic after a 6-month course of rehabilitation under remote conditions of service provision, the parents’ feeling of “intolerable observation of the child’s condition” decreased statistically significantly from 18/20 to 10/20 (RR=1.8; 95% SI 1.1–2.8; $p=0.0126$), “sleepless nights due to the child’s condition” from 15/20 to 8/20 (RR=1.8; 95% SI 1.0–3.3; $p=0.0379$). Other emotional states remained after physical therapy, but “Most of the time” parents began to note the need to seek compassion and understanding “needs talked to anyone who could specifically help”, “feelings of inner anxiety”, “a sense of possible trouble”.

DISCUSSION

Most rehabilitation programs for children with paralytic syndromes for several decades have been aimed for normalizing motor functions, ensuring normal posture and independent functional activity of the child, regulating muscle tone, improving visual and auditory responses, supporting motor development and motor control, preventing joint contractures, etc. According to experts, setting individual realistic aims, setting priorities, informing the family, and strengthening its participation increase the effects of physical therapy [14].

But according to many researchers, the effectiveness of physical therapy in children with paralytic syndromes is not based on sufficient scientific evidence. The use of such indicators as the type of exercise, their frequency, intensity, and duration has been demonstrated to assess the effectiveness of physical therapy [15].

For example, a recent review of evidence-based approaches to physical therapy for children with cerebral palsy, published in 2019, demonstrates the fact that the effectiveness of most interventions is limited. Despite the recognition of the effectiveness of individual targeted approaches to rehabilitation, future research is needed to determine the best ways to improve functional outcomes in children [16].

Our own study did not include a thorough analysis of a particular approach, type of exercise and their intensity in the provision of rehabilitation services to children with paralytic syndromes. We used a multidisciplinary approach based on the individual needs of a young patient, using a time interval of 6 months, GMFCS. And the main task was to determine the impact of physical therapy on chronic pain in children with paralytic syndromes, objective and subjective assessment of their parents, and their emotional state. The study involved 96 children and their 96 caregivers (mostly mothers) during 2018–2020 and those who agreed to participate in the study. The research was conducted both in the pre-pandemic and in the pandemic periods with the introduction of “orange” and “red” quarantine measures in the country.

A review of publications from 1990 to 2011, which included studies that have identified parents’ experiences

with their child’s therapy, where a quarter of the child’s population was under five years old, children receiving physical and/or occupational therapy in a rehabilitation program, provided a conceptual basis for that the experience of parents is closely related to the quality of intervention for the child [17]. This review evaluated 13 studies (eight qualitative and five quantitative). Parents expressed different aspects of their experiences, had different needs, and needed time to establish a relationship with their child’s physical therapist [18].

Our proposed questionnaire created the conditions for closer interaction between the physical therapist and parents because we considered the experience of the parents (their assessment for rehabilitation), their emotional state, the awareness that the child has chronic pain and the ultimate importance of the wider context of the child in the family.

Equally important is the fact that physical therapists have received feedback on children’s subjective assessment of pain “through the eyes of parents” and their emotional state. One Finnish survey of 201 members of a multidisciplinary team and 311 physiotherapy service providers found that they tended to rate their family-oriented service positively. However, the study showed that the family-oriented approach increases with increasing experience of the specialist [19].

Therefore, our research and the proposed questionnaire can be used to identify areas for improvement not only by our team of specialists, but also for use in other rehabilitation practices.

We choose a 6-month interval to draw some conclusions about the effective components of physical therapy for children with paralytic syndromes. This decision was based on a study that examined a 6-month lifestyle intervention in children and adolescents with cerebral palsy. Researchers have shown with high confidence that lifestyle modifications during this period (physical therapy, counseling) increase social participation, reduce fatigue, reduce pain, improve the quality of life and mental health of children with paralytic syndromes, as demonstrated by our study [20].

Children with paralytic syndromes have a number of factors that cause pain [20]. There is little empirical evidence that pain is better assessed clinically nowadays. The search for pain assessment in recent decades has led to the development and use of standardized pain assessment tools. Moreover, research and extensive international cooperation in this area continues, especially in people with developmental delays and cognitive impairments [21].

The researchers recognize that pain in children with intellectual disabilities is a common and complex phenomenon. However, there are no standard educational components for caregivers or guardians of such children [22]. Our study focuses on information for parents and professionals that nonverbal children (including children from 1 to 6 years old) with paralytic syndromes may have chronic pain, and they should be monitored for pain. Parents with a physical therapist can use pain assessment tools and gain experience in measuring it.

We have chosen the r-FLACC scale among the existing tools for assessing pain in nonverbal children. The selection of this scale was based on the studies of clinicians from three medical centers who viewed 15 videos of observations of children with neurological disorders using three pain assessment tools and preferred this scale. In addition, clinicians' scores correlated with parental scores ($p < 0.001$) and the reliability of testing and retesting was confirmed by strong correlations ($r = 0.8-0.883$; $p < 0.001$) [23].

In our opinion, the interesting study were performed from 2011 to 2014. The definition of pain in a cohort of children with developmental disabilities ($n = 544$) who attended an outpatient clinic was studied. The average age of children was 14 years in contrast to our research. A third of all children were suffered from cerebral palsy. Children were diagnosed with emotional disorders (anxiety and depression) accompanied by chronic pain, and even one that required treatment at the tertiary level of care. The authors consider that pain assessment should be a routine practice for all multidisciplinary teams [24].

The focus of our study was to examine the effect of a 6-month course of physical therapy on chronic pain in children with paralytic syndromes. We obtained data on the reduction of the frequency of moderate pain in children after 6 months without pharmacological intervention almost twice ($RR = 2.3$; 95% SI 1.1–4.7; $p = 0.0358$) in the pre-pandemic period. This confirms the fact that physical therapy is an integrative method of treating chronic pain in young children, which helps to optimize their health.

The evaluation and re-evaluation of chronic pain in children by their parents is still a debatable issue. Our study of subjective assessment of parents for moderate and severe pain in children with paralytic syndromes according to the questionnaire and comparing its frequency with objective assessment using the r-FLACC scale showed that parents overestimate the frequency of pain in children. The obtained results coincide with the data of the study of the reliability of parental pain assessments in children with cognitive impairment under the same methodology (using the FLACC scale simultaneously with nurses) [25]. This is due to the emotional and psychological state of the parents of children with neurological disorders.

According to one study, the psychological and physical health of caregivers of children with paralytic syndromes was highly dependent on the child's behavior and childcare requirements. Problems with children's behavior were an important factor in the psychological well-being of guardians, both directly and indirectly, because of their impact on self-perception and family functions [26]. These data confirm the influence of the emotional state of mothers directly in the first place on the emotional state of children and vice versa [27].

Strategies of optimizing of the caregivers' physical and psychological health include support for behavioral management and daily functional activity, as well as stress management techniques. Therefore, it is very important for specialists of multidisciplinary teams to know the emotional state of parents to correct their quality of life,

the effectiveness of clinical interventions and care [28].

We identified some emotional problems in this study, and we hypothesized, that physical therapy would help to improve parents' emotional state. Thus, in the pre-pandemic period, a 6-month rehabilitation course allowed us to improve falling asleep ($RR = 1.9$; 95% SI 1.4–2.6; $p < 0.0001$) and sleep ($RR = 1.9$; 95% SI 1.3–2.6; $p < 0.0001$), reduce anxiety about the child's health ($RR = 2.3$; 95% SI 1.6–3.2; $p < 0.0001$) and reduce feelings of internal anxiety ($RR = 1.9$; 95% SI 1.4–2.5; $p < 0.0001$). Although we did not get a reduction in most other emotional disorders.

Another subgoal of our study was to identify changes in the impact of physical therapy on chronic pain in children with paralytic syndromes and the emotional state of their parents during the COVID-19 pandemic. Rehabilitation services were provided remotely as counseling by means of telecommunications and full involvement of parents in the implementation of exercises during of quarantine. With the advent of the SARS-CoV-2 virus pandemic, critical aspects of the management and care of these children arose, because they did not have access to the facility's services [29].

Now, it is essential to accumulate scientific knowledge and a larger contingent of children and their families, as they are in a crisis. Psychotherapeutic interventions and social support for such families should be strengthened.

LIMITATIONS

There were some inherent limitations associated with this study; firstly, sample size. Our model was based on non-invasive single-center cross-sectional study and was limited by the time and number of children with paralytic syndromes and their parents. Secondly, there were very few prior research and gaps in the same studies. Our study was limited by the age of children from 1 till 6 years old.

There were confounders such as convulsions, pharmacological treatment of severe chronic pain. Third, this study did not examine the evaluation of service users, so it cannot be commented on. Fourth, the psycho-emotional state was studied mostly in mothers without determining their educational, family, and social status, and the results obtained are not quantifiable. Fifth, the attitude of all rehabilitation stakeholders to providing services during the COVID-19 pandemic has not been proven, so some remarks have been made. The results of statistical processing of the proposed questionnaire are not given in full, and the reliability of this tool should be evaluated in future reviews.

CONCLUSIONS

The authors consider that physical rehabilitation in children with paralytic syndromes reduces the incidence of moderate chronic pain and improves the emotional state of parents. But, these changes do not occur during the pandemic. So, we think that new approaches to rehabilitation should be applied not only with the help of telecommunications, but with daily management of the children with paralytic syndromes' needs and their families with

increased psychological and social support. Perhaps the searching for new approaches that optimize more intensive and effective rehabilitation strategies using the family reserve will provide the potential for adaptability of nerve plasticity and recovery in such a contingent of children and prospects for the future.

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