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Original Research Article

Functional status assessment in children with moderate and severe intellectual disability using pediatric version of the Functional Assessment of Patients

Beata Depczyńska [a,*], *Marek Jóźwiak* [b], *Witold Dudziński* [c]

[a] *Complex of Special Schools No. 103 in Poznań, Poland*
[b] *Chair and Department of Children's Orthopaedics and Traumatology, Poznan University of Medical Sciences, Poland*
[c] *Rehasport Clinic, Poznań, Poland*

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ABSTRACT

Introduction: Evaluation of a patient's functional condition is the main factor determining the choice of appropriate therapeutic actions.

Aim: The objective of this study was to determine the diagnostic value of the Functional Assessment of Patients (OFC-FAP; from Polish Ocena Funkcjonalna Chorych) pediatric version scale in the process of rehabilitative treatment as a method of assessing the level of losing, obtaining or re-obtaining functionality in everyday lives of children with cerebral palsy (CP) and moderate or severe intellectual disability (ID).

Material and methods: Thirty-three children with CP and moderate or severe ID were studied. The ID level evaluation was performed with the use of revised version of Wechsler Intelligence Scale for Children. Upon starting the study patients were at the age from 6 to 18 years. The examination with the use of the OFC-FAP pediatric version scale was conducted twice, 12 months apart. Between the studies, children were subjected to rehabilitative enhancement. The patients were studied in six dimensions (in total 195 functional tasks were studied).

Results and discussion: The level of functional capability observed both in the first and the second study was higher in children with moderate ID than in those with severe ID.

Conclusions: The pediatric version of OFC-FAP observational method, based on using the functional status assessment sheet, is an individualized and sensitive form of collecting information on the functional status of children with CP and co-occurring ID at moderate and severe level.

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* *Correspondence to*: Cienista 36, 62-051 Wiry, Poland. Tel.: +48 606 341 499.
E-mail address: beata.depczynska@wp.pl (B. Depczyńska).

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1. Introduction

The satisfactory function is one of the most important health indicators, along with improving the mental attitude and the state of well-being. It is defined as a set of features ensuring the ability of accustoming, that is adapting of particular organs and systems to serving bodily functions in the conditions of a given environment. It is defined by the correct morphological build of particular organs and the proper co-functioning of life-important systems during the processes of physiological reactions in organism.[1] According to the World Health Organization (WHO), it is important to consider the functional status of a person while assessing human health status. In the International Classification of Functioning, Disability and Health (ICF) published in 2001, WHO recognized the influence of illnesses on patient's functioning in the context of losing organ's functions and, therefore, functionality, which also relates to losing personal functionality and limiting the degree of social participation.[2] The influence of health status on a person's functionality can be assessed by measuring the results obtained while performing the tasks or functions connected to daily activities.[3] Accurate establishment of a patient's functional status is the main factor determining the right therapeutic action. On the basis on the functional examination and determining the "functional factors of the highest potential for the function to return,"[4] an interdisciplinary plan of treatment course should be established.[3] The goals of conducting the functional assessment of patients are mostly: assessment of the effects of the used rehabilitative action, determining the results of medical interventions, long-term prognosis, assessment of patient's self-dependence, assessing the need of providing potential care, and reference for jurisprudence.

The third most common reason for long-lasting disability in children across the world is cerebral palsy (CP)[5] perceived as a non-progressing injury to the central nervous system (CNS) leading to the occurrence of age-dependent disorders regarding movement, posture and other anomalies of the early-developed brain.[6] Połatyńska and Kępczyński[5] claim that the main CP diagnosis criteria of symptoms indicating lesions to the CNS include such co-occurring symptoms as intellectual disability (ID).

ID is not a nosological unit but an inhomogeneous set of disorders caused by various causal factors of complex pathogenic mechanism, with inhomogeneous morphological and clinical image and course. ID is considered not a feature but a status that limits the functioning of an entity.[7]

To measure the clinical phenomena occurring in patients, clinimetrics introduced by Feinstein (1983)[8] and by Asplund (1987)[9] is used – it is a domain of science dealing with the construction of research tools meant for the quantitative assessment and analysis of clinical phenomena.

One of the interesting and modern scales, which currently operate is the Functional Assessment of Patients (OFC-FAP; from Polish Ocena Funkcjonalna Chorych) method.[3] It is an individual scale of observation, characterized by high sensitivity measurements.

2. Aim

The goal of the study was to determine the diagnostic value of pediatric version of OFC-FAP method in the process of rehabilitative treatment. The question arises is this method precise enough to determine the level of losing, obtaining or re-obtaining functions related to everyday activities in children with CP and moderate and severe ID.

3. Material and methods

The study material consisted of children with CP and co-occurring ID at moderate and severe level, attending the Complex of Special Schools No. 103 in Poznań. Thirty-three children were qualified to the study (19 girls and 14 boys). At the time of starting the study patients were at the age from 6 to 18 years (average age: 13.08). The patients were divided into two groups depending on the level of their ID. First group consisted of 15 children with moderate ID, second one of 18 children with severe ID. The ID level evaluation was performed with the use of revised edition of Wechsler Intelligence Scale for Children (WISC-R).[10]

Pediatric version of OFC-FAP scale was designed on the basis of already functioning OFC-FAP scale for adults[3] to conduct the observations presented herein. The study with the use of the OFC-FAP pediatric version scale was conducted twice, 12 months apart. Both studies were based on the same basic questionnaire. Between the studies children were subjected to rehabilitative treatment involving individual activity (the corrective gymnastics) for 2 h a week and group activity (the physical education) for 3 h a week.

The methodology of the study using the OFC-FAP pediatric version method consisted in observing patients by the therapist in different functional settings and filling in the study sheet, which contained six categories of the observed functions ("fitness", "movement", "dexterity", "eating", "dressing up", "washing/hygiene"). The number of all functional tasks amounted to 195.

The assessment was conducted on each self-contained performance of a particular function with no indefinite external aid, which could be of different range and nature every time. The given answer ("yes/no") allowed for obtaining the real image of the parameters of the assessed function.[3] The "yes" answer granted the child 1 point, while the "no" answer granted 0 points.

The obtained results were entered into the OFC-FAP pediatric version system. It automatically conducted data analysis by calculating the current status and the change of the functional image over time (after another study) and presenting it in a graphic and mathematical manner. The graphic and mathematical analysis compared the chosen functional tasks, juxtaposing the scores with the assumed 100% performance rates. The program calculated the percentage value of positive answers in relation to all questions asked in the first and the second study alike. The difference between those values proved the improvement (when the score was positive), deterioration (when it was negative) or no change in the functional status of patients over time.

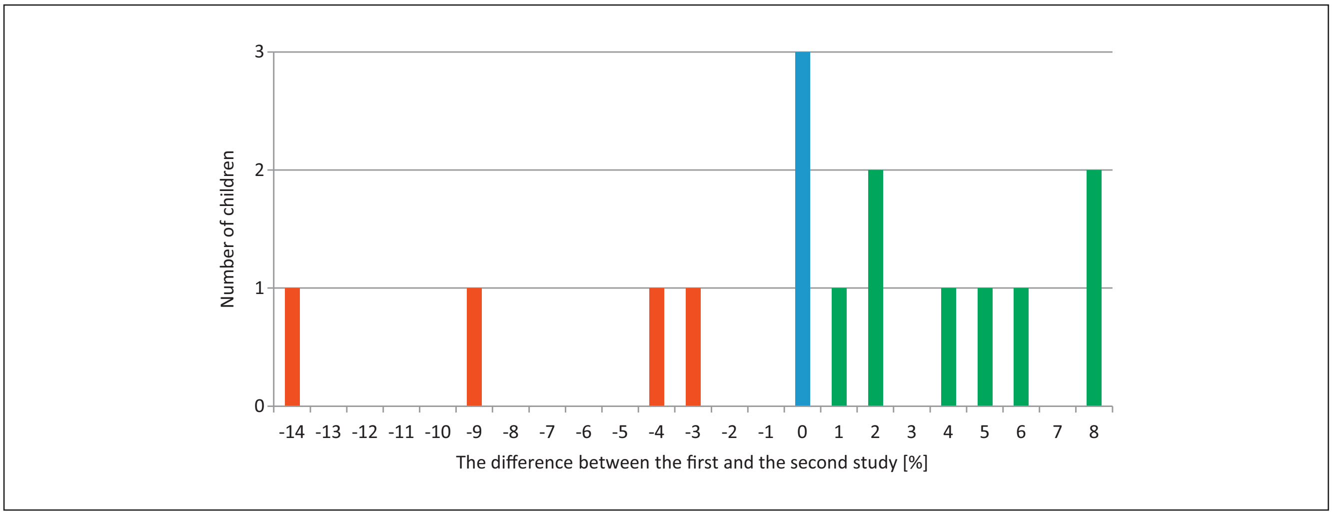

Fig. 1 – The distribution of difference between the first and the second study in the group of children with moderate ID. *Comments*: green – "improvement", blue – "no change", red – "deterioration".

4. Results

In the case of the children with moderate ID it was observed that the general score of the first study was between 25% and 100% positive (71.9% on average), while the second study score was between 31% and 100% positive (72.3% on average).

In the case of the children with severe ID it was observed that the general score of the first study was between 4% and 75% positive (37.9% on average), while the second study score was between 5% and 74% positive (42.2% on average). The above mentioned data indicate that the level of functional capability observed during the first and the second study was higher in children with moderate ID than in those with severe ID. In both groups, the percentage score of the second study was higher than that of the first study.

In statistical analysis the Kruskal–Wallis test was used and two structure indicators. The scores were to be considered statistically significant as long as the *P*-value appeared equal or lower than 0.05 ($P \leq .05$).

Figure 1 presents the distribution of difference between the first and the second study in the group of children with moderate ID. It shows that the largest group (8 children) consisted of patients who were observed with positive change in their functional status in the second study, achieving "improvement" at the rate from 1% to 8% when compared to the first study. Three children were observed with no change in the functional status between the first and the second study ("no change"). In 4 children the functional status worsened when compared to the first study, amounting to between −3% and −14% ("deterioration").

Figure 2 presents the distribution of difference between the first and the second studies in the group of children with

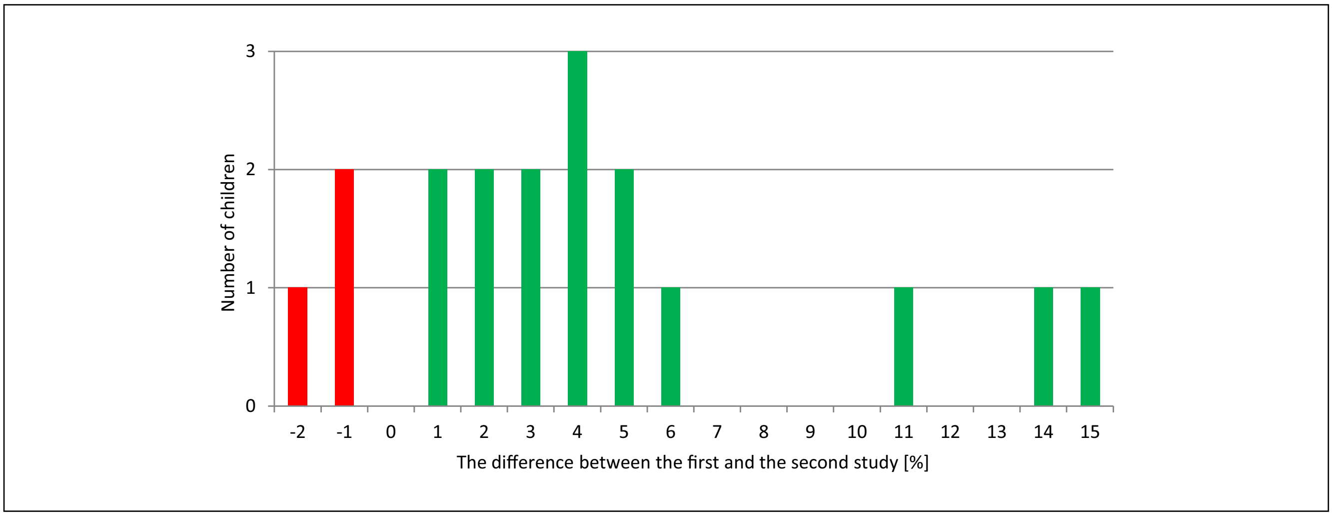

Fig. 2 – The distribution of difference between the first and the second study in the group of children with severe intellectual disability. *Comments*: green – "improvement", red – "deterioration".

Table 1 – Score change between the first and the second study in relation to the level of ID.

Score change OFC-FAP pediatric version	ID		In total
	Moderate	Severe	
Improvement	8 53.3%	15 83.3%	23 69.7%
No change	3 20.0%	0 0.0%	3 9.1%
Deterioration	4 26.7%	3 16.7%	7 21.2%
In total	15 100.0%	18 100.0%	33 100.0%

severe ID. It shows that the largest group (15 children) consisted of patients who were observed with positive changes in their functional status in the second study, achieving "improvement" at the rate from 1% to 15% when compared to the first study. No child was observed with lack of change in the functional status between the first and the second study ("no change"). In 3 children the functional status worsened when compared to the first study, amounting to between −1% and −2% ("deterioration").

The percentage distribution of the number of children in particular groups ("improvement," "no change," "deterioration") is presented in Table 1. It shows that the functional improvement was observed in 53.5% of children with moderate ID and 83.3% of children with severe ID. No change in the functional status was observed in 20% of children with moderate ID, whereas in the case of the children with severe ID changes were not observed regarding the functional status. Functional status deterioration was observed in 26.7% of patients with moderate ID and 16.7% of those with severe level of ID.

A statistically significant difference was observed between children with moderate ID and those with severe ID in the "no change" category ($P = 0.047$). Measurements were conducted by testing two structure indicators. The remaining values presented in the table presented no statistically significant difference.

The value analysis of the difference between the first and the second study in particular categories in relation to the ID indicated that only the "fitness" category has statistical significance and amounted to $P = 0.0398$ (Table 2).

Table 2 – The value of the difference between the first and the second study for all patients in the "fitness" category in relation to the level of ID.

Statistical parameters	ID	
	Moderate	Severe
Number of patients (No.)	15	18
Average (%)	0.13	6.39
Median (%)	0.00	5.00
Minimum (%)	−18	−3
Maximum (%)	9	24
Standard deviation (%)	7.05	7.55

Comment: P = .0398.

5. Discussion

The assessment of the functional status of a person is highly important and draws the attention of many researchers. The consequence of such major and universal interest in the functional status assessment of patients is the necessity of using appropriate diagnostics allowing for the determination of the treatment objectives and the proper evaluation of the conducted therapy results. For instance, using the Barthel and Rankin scales aids the functional status assessment of patients who have suffered from stroke and facilitates the assessment of the rehabilitation progress.[11]

The observed close relations between the functional status of patients and the choice of the optimal treatment methods contribute to the development of the functional examination. The choice of appropriate rehabilitative procedures, physiotherapy, surgery techniques and pharmacological treatment methods depends on the results obtained by using the right methods of the functional status assessment. The results of the functional status assessment influence the entirety of the complex approach to patients – both adults and children. It is explicitly underlined by the ICF principles introduced by WHO.[2,12–14] The diagnostics compliant with the ICF principles is based, inter alia, on the functional status assessment of patients. Such approach inevitably leads to considering the functional assessment of patients as an important element of diagnostic and treatment procedures.

The results of the conducted studies were based on the functional observations of children with moderate and severe ID prior to and after conducting rehabilitative treatment.

Kowalski and Donay-Pukińska[15] claim that the issue of rehabilitating children with significant ID and choosing the optimal care model, on the basis of evaluating the effectiveness of forms and methods of work, has not been given enough attention and interest from researchers yet.

In the conducted studies it was observed that the general results of the first and the second study decrease along with increasing the level of ID. Similar conclusions were drawn by Borkowska,[16] who noticed that the developmental capabilities shrink proportionally to the level of ID. Also, Wołosewicz et al.[17] observed similar links by studying children with CP – they found major correlation between fitness and ID level. Moreover, they claimed that positive prognosis depends not only on the level of a child's intellectual development level but also on the appropriate choice of treatment methods initially selected after analyzing the child's functional status.[18] The analysis of the treatment results also requires the use of an objective scale such as the patient's functional status protocol.[19]

Observing the functioning of patients with CP and co-occurring moderate and severe ID indicates that the most appropriate tool to be used in studies among that group of children is a scale that allows for: conducting observations as a means to collect information on patients, adopting individual approach to every patient and having considerable sensitivity.

The observational OFC-FAP pediatric version scale was developed in order for the examination to be individualized. In keeping with the OFC-FAP pediatric version principle, there is no importance in comparing the obtained results to those of other patients, but rather in comparing and analyzing the given patient's result changes over time.

During the study it was possible to observe the change in the functional status in children thanks to comparing the results obtained in the first and the second study. The OFC-FAP pediatric version scale is sensitive enough and its structure allows for unlimited analysis of changes in a given function over time. Both the number and the kind of the examined functions can be selected by the examiner, as a result of which the evaluation sensitivity can be as accurate as the examiners desire.

The results obtained by using the OFC-FAP pediatric version scale indicate that there is relevant diagnostic value in the presented research tool. They also prove that, as a method of determining the level of losing, obtaining or re-obtaining functionality concerning the everyday lives of children with CP and moderate and severe ID, it achieves its objectives and meets the needs of such specific groups of patients as their families and therapists.

6. Conclusions

1. OFC-FAP pediatric version method, conducted on the basis of the functional status assessment sheet, is an individualized and sensitive form of collecting information on the functional status of children with CP and co-occurring moderate and severe ID.
2. OFC-FAP pediatric version scale has diagnostic purposefulness during the process of evaluating the results of rehabilitative treatment in the everyday lives of children with moderate and severe ID and co-occurring CP.

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