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POLISH JOURNAL OF PHYSIOTHERAPY

OFICJALNE PISMO POLSKIEGO TOWARZYSTWA FIZJOTERAPII

THE OFFICIAL JOURNAL OF THE POLISH SOCIETY OF PHYSIOTHERAPY

NR 4/2018 (18) KWARTALNIK ISSN 1642-0136

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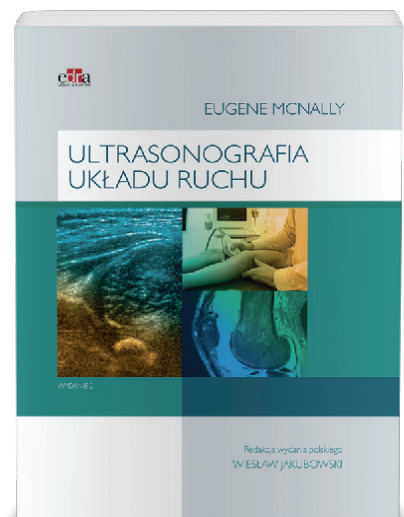
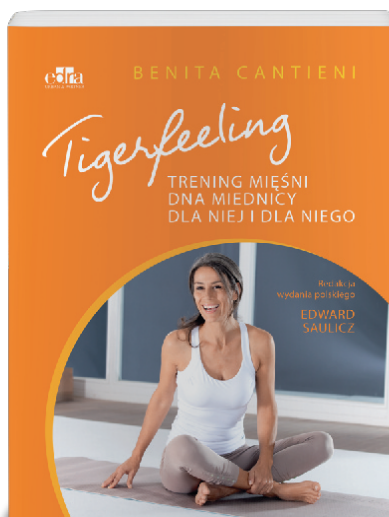
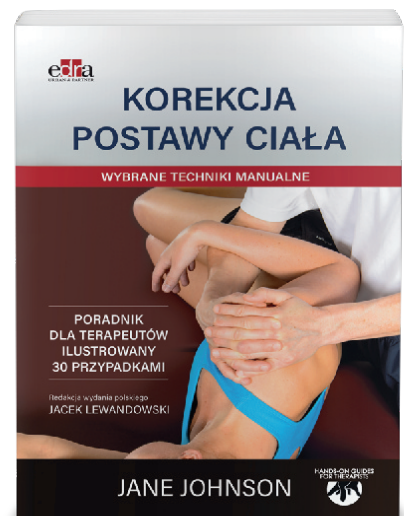
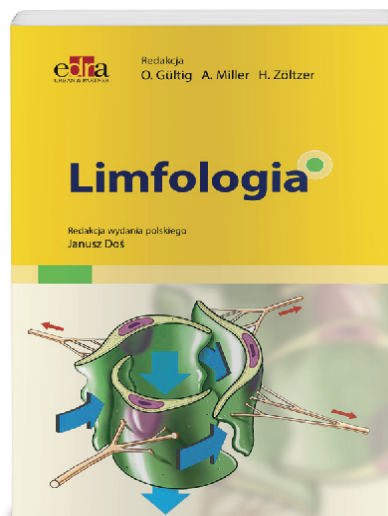
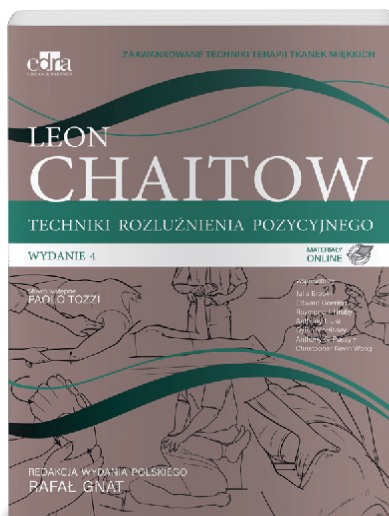
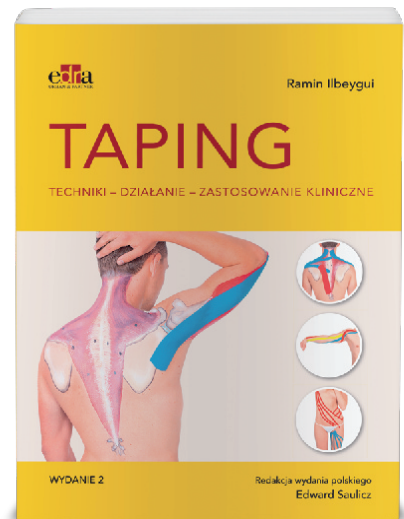
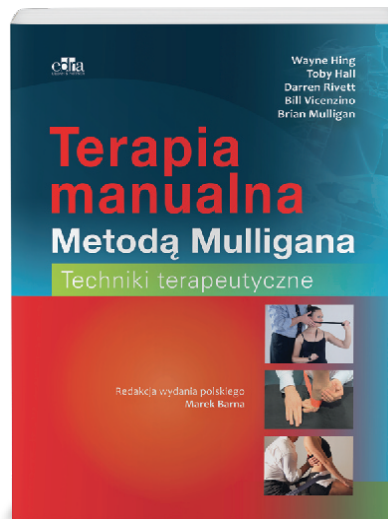


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Evaluation of functional status of children with cerebral palsy using selected scales and tests

用选定量表和测试评估脑瘫儿童的功能状态

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Streszczenie

Cel pracy. Celem pracy jest ocena stanu funkcjonalnego dzieci z mózgowym porażeniem dziecięcym (MPD) przy użyciu wybranych skal i testów oraz analiza czynników wpływających na uzyskane wyniki.

Materiał i metody. Badaniem objęto 33 dzieci z rozpoznaniem MPD w wieku od 4 do 18 lat uczęszczających do wybranych ośrodków rehabilitacyjnych na terenie województwa łódzkiego. Jako narzędzie badawcze zastosowano autorską ankietę i do oceny motoryki dużej skalę Gross Motor Function Measure (GMFM) oraz Gross Motor Function Classification System (GMFCS), a do motoryki małej Manual Ability Classification System (MACS).

W analizie statystycznej wpływ zmiennych ilościowych na wyniki skal określony został na podstawie współczynnika korelacji Pearsona i Spearmana w zależności od rozkładu. Do oceny wpływu zmiennych jakościowych na sprawność funkcjonalną dzieci wykorzystano analizę wariancji ANOVA lub nieparametryczny test Kruskala-Wallisa.

Wyniki. Siedmioro dzieci wykazywało zerową lub skrajnie niską sprawność fizyczną. Były to dzieci z porażeniem czterokończynowym – tetraparezą. Na wyniki testów miała wpływ długość trwania ciąży, urodzeniowa masa ciała, wiek i wzrost, oraz kontakt słowno-logiczny. Nie stwierdzono związku pomiędzy zmiennymi jakościowymi, takimi jak: płeć i współistniejąca padaczka. Zaobserwowano silną korelację między motoryką małą i dużą.

Wnioski: W zastosowanych skalach i testach badane dzieci przedstawiały zróżnicowany poziom sprawności funkcjonalnej. Ilość punktów uzyskiwana przez nie była ściśle powiązana z typem MPD. Dzieci w lepszym kontakcie słowno-logicznym osiągnęły lepszą punktację w ocenianych skalach.

Subiektywna ocena sprawności dzieci według rodziców pokrywała się z wynikami testów.

Słowa kluczowe:

mózgowe porażenie dziecięce, MACS, GMFM, GMFCS

Abstract

Objective. The aim of the study was to assess the functional status of children with Cerebral Palsy (CP) using selected scales and tests and to analyze the factors affecting the results.

Material and methods. The study involved 33 children diagnosed with CP, aged 4 to 18 years, attending selected rehabilitation centers in the Lodz region. The research tools included: an original questionnaire, the Gross Motor Function Measure (GMFM) and the Gross Motor Function Classification System (GMFCS) to evaluate the gross motor skills and the Manual Ability Classification System (MACS) for fine motor skills.

In the statistical analysis, the influence of quantitative variables on the scale results was determined on the basis of Pearson and Spearman correlation coefficient depending on the distribution. The one-way ANOVA or the non-parametric Kruskal-Wallis test was used to assess the effect of qualitative variables on the functional efficiency of children.

Results. Seven children showed none or extremely low physical fitness. They were children with paralysis of four limbs – tetraparesis. The results of the tests were influenced by the length of pregnancy, birth weight, age and height and verbal-logical contact. No correlation was found between qualitative variables such as gender and coexisting epilepsy. A strong correlation was observed between fine and gross motor activity.

Conclusions. The examined children presented varying levels of functional fitness in the used scales and tests. The number of scores obtained by them was strictly related to the type of CP. Children in better verbal and logical contact achieved better scores in the assessed scales. Subjective assessment of children's performance according to parents was in compliance with the test results.

Key words:

cerebral palsy, MACS, GMFM, GMFCS

摘要

研究目的。研究目的在使用选定的量表和测试，以评估脑瘫儿童（MPD）的功能状态并分析影响结果的因素。

材料和方法。有33名4至18岁间被诊断出患有MPD的儿童参与研究，他们在特定的罗兹省康复中心就诊，研究工具为原创问卷及用于评估粗大运动机能测量（GMFM）的大肌活动及粗大运动机能分类系统（GMFCS），用于手动能力分类系统的小肌活动。

在统计分析中，变量对等级结果的影响是根据皮尔逊和斯皮尔曼的相关系数确定的，具体取决于分布。定性变量对儿童体适能的影响评估中使用ANOVA方差分析或克-瓦单因子变易数分析。

结果。7名儿童显示出零或非常低的体适能，他们是患有四肢瘫痪的儿童，测试结果受怀孕时间长短、出生体重、年龄及身高和语言逻辑接触的影响。性别及伴随癫痫等定性变量之间没有关系，能动性大小之间则有强相关性。

结论：在所使用的量表和测试中，受试儿童呈现出不同程度的体适能，其获得的分数与MPD类型紧密相关。语言逻辑接触佳的儿童在评估量表中取得更好的分数，父母对儿童体适能的客观评估与测试结果符合。

关键词：

小儿脑瘫、MACS、GMFM、GMFCS

Introduction

Cerebral Palsy (CP) is a general concept describing permanent disorders of the development of posture and motor control that are attributed to non-progressive disturbances that occurred in the developing fetal or infant brain, often accompanied by disturbances of sensation, perception, cognition, communication and behavior, by epilepsy and by secondary musculoskeletal problems [1]. It is one of the most frequent diseases of the nervous system among children occurring in two per thousand live births [2, 3].

The clinical picture of CP comprising the topographical distribution of the disorders, the degree of physical disability, accompanying dysfunctions and causes, is diverse and it is not able to tell us anything about the patient's functional status [4]. It seems advisable to use special scales and tests to assess the child's health status [5, 6].

Frequently used scales in many countries are GMFM and GMFCS to evaluate gross motor skills and Manual Ability Classification System (MACS) to assess fine motor skills [7, 8, 9].

Aim

The aim of the study was to assess the functional status of children with CP using GMFM, GMFCS, MACS and the analysis of factors affecting the results of these scales.

Material and methods

The study involved 33 children (15 girls and 18 boys) diagnosed with CP, aged 4 to 18 years attending rehabilitation centers. The research was carried out in the following centers: "Szansa" at 21 Wysoka St., Piotrków Trybunalski and "Neurostyk" at 20 Wrocławska St., Łódź, in the period from 1.06. until 30.06. 2018. The study was approved by the Bioethics Committee at the Medical University of Łódź.

The inclusion criteria:

- diagnosis of CP
- age 4 to 18 years
- attending the rehabilitation center
- written consent of the child's parents or legal guardians.

The method of treatment or the presence of coexisting diseases were not the criteria disqualifying from the study.

Some patients (16) did not show verbal-logical contact and were characterized by a certain degree of mental retardation which hindered significantly the performance of functional tests. Furthermore, children were not burdened with coexisting diseases that would make the study difficult, except for one girl who is dumb and blind.

An original questionnaire consisting of 21 questions and three scales: GMFM, GMFCS and MACS were used. The questions concerned demographic data, the course of pregnancy, general health status and the type of physiotherapy. In all cases, the questionnaire was completed by parents.

The GMFM consists of 88 items categorized into five dimensions: lying and rolling; sitting; crawling and kneeling; standing and walking, running and jumping [10]. Each category contains specific commands, which are rated on a scale from 0 to 3, where 0 = does not initiate movement,

1 = initiates, 2 = partially completes and 3 = completes. The maximum number of scores is 264.

The next scale used is GMFCS. It is divided into five levels assessing the functional status and the need to use mobility devices such as crutches, walkers or wheelchairs. Level I means performing activities without limitations and level V means using a wheelchair. GMFCS is based on the observation of spontaneous mobility, depending on the age of the child (5 age groups) [11, 12].

MACS distinguishes five levels of manual skills. Classification to the first level means a great ease and effectiveness in using objects, while belonging to the fifth level indicates lack of ability to use them and serious limitations of the ability to perform simple activities of everyday life. The MACS level is set by asking questions to the person who knows the child very well and knows the child's manual ability to handle objects in daily life [7, 13].

Statistical analysis

The data were verified as regards the normality of distribution and equality of variance. The influence of quantitative variables on the scale results was determined on the basis of Pearson and Spearman correlation coefficient depending on the distribution. The one-way ANOVA or the non-parametric Kruskal-Wallis test was used to assess the effect of qualitative variables on the functional efficiency of children. Data are presented as mean and standard deviation. The value of $p < 0.05$ was considered statistically significant.

Results

The characteristics of the investigated group is presented in Table 1. All tested children were diagnosed with cerebral palsy, 6 of them with coexisting epilepsy. Fifteen were firstborn, four were from the second pregnancy when the first was miscarried and the remaining fourteen were from the second or subsequent pregnancy.

Table 1. Characteristics of the study group

	Age (years)	Weight (kg)	Height (m)	BMI	Week of delivery	Birth weight (g)	APGAR (pts)	Center
Mean $\pm$ SD	9.8 $\pm$ 5.02	27.1 $\pm$ 13.9	1.30 $\pm$ 0.21	17.00 $\pm$ 5.16	35.55 $\pm$ 4.68	2684.7 $\pm$ 1011.55	6.79 $\pm$ 2.36	Szansa – 19
minimum-maximum	4-18	12-65	0.98-1.89	9.88-33.84	32-40	500-4550	1-10	Neurostyk – 14

SD - standard deviation

Eighteen deliveries were categorized as spontaneous and 15 as caesarean. Most of them were eutrophic newborns delivered at 35 weeks of gestational age with the health status assessed as moderate. Seventeen were preterm infants born between 37 and

40 weeks of gestation and two born after 40 weeks of gestation. Children with normal birth weight predominated, however, the birth weight of thirteen of them was too low and was not within the normal range. The low Apgar score (0-3 points) was obtained by 4 children, moderate (4-7) by 17 and good (8-10) by 12. The efficiency of the child was assessed very low by 17 parents, low by 3 and moderate and good by 13 of them.

All children undergo regular physiotherapy, at least by one special method: by NDT Bobath – 28 patients, by Vojta's method – 15, PNF – 6, SI – 12. Twenty one children participate in occupational therapy, 17 use the swimming pool. In most cases, physiotherapists use two or more methods to get the best results. Moreover, 28 parents work independently with the child. The most frequently combined methods are the Vojta and NDT Bobath methods. Sixteen children started rehabilitation immediately after birth, twelve in the first year of life, and the remaining five later than that. Seventeen remain in verbal-logical contact.

The characteristics of the results of functional tests is presented in Table 2. The distribution of scores in each category of GMFM shows a decreasing trend in the number of the obtained scores, which is correlated with the increasing level of difficulty of subsequent tasks. A large discrepancy in the obtained results is also visible. The number of scores is closely related to the type of CP and the level of the child's functional efficiency. Seven children showed none or extremely low physical fitness. These are children with paralysis of four limbs – tetraparesis.

Table 2. Characteristics of functional test results in the investigated group

	GMFM total	GMFM lying and rolling	GMFM sitting	GMFM crawling and kneeling	GMFM standing	GMFM walking, running and jumping	GMFCS	MACS
Mean $\pm$ SD	112.24 $\pm$ 92.34	33 $\pm$ 20.1	31.36 $\pm$ 23.24	17.27 $\pm$ 16.94	12.3 $\pm$ 15.38	18.3 $\pm$ 25.4	3.15 $\pm$ 1.64	3.18 $\pm$ 1.47
minimum-maximum	0-261	0-51	0-60	0-42	0-39	0-69	1-5	1-5

SD - standard deviation

In GMFCS 19 children achieved level 4 or 5, reflecting a low degree of functional efficiency, whereas 14 – level I and II, which proves relatively high efficiency. In the MACS scale 17 children reached level 4 and 5, which indicates low manual skills and 7 children obtained level 1. The effect of quantitative variables on the functional efficiency of children is presented in Table 3. The scale results were influenced by age and height of children, duration of pregnancy and birth weight. Older and taller children from longer gestation and higher birth weight achieved lower scores in GMFM and higher in GMFCS and MACS.

Table 3. Factors affecting the results of children functional skill scales

	GMFM	GMFCS	MACS
Age	Rho = -0.45 P = 0.01	Rho = 0.50 P = 0.005	Rho = 0.41 P = 0.02
Weight	Rho = -0.31 P = 0.08	Rho = 0.35 P = 0.047	NS
Height	Rho = -0.45 P = 0.01	Rho = 0.48 P = 0.006	Rho = 0.36 P = 0.04
Week of delivery	Rho = -0.34 P = 0.05	Rho = 0.43 P = 0.01	Rho = 0.38 P = 0.03
Birth weight	Rho = -0.36 P = 0.04	Rho = 0.44 P = 0.01	Rho = 0.42 P = 0.02
GMFM	Rho = 1 P < 0.001	Rho = -0.87 P < 0.001	Rho = -0.82 P < 0.001
GMFCS	Rho = -0.87 P < 0.001	Rho = 1 P < 0.001	Rho = 0.88 P < 0.001
MACS	Rho = -0.82 P < 0.001	Rho = 0.88 P < 0.001	Rho = 1 P < 0.001

The influence of qualitative variables on children's performance is presented in Table 4. Children born by caesarean obtained higher scores in the GMFM and were qualified for lower levels in GMFCS and MACS. Gender and coexisting epilepsy did not affect the results of the tests.

Scale results overlap with the subjective assessment of fitness according to parents in each test. Children with better verbal and logical contact achieved better results in the assessed scales.

Tab. 4. Wpływ zmiennych jakościowych na sprawność funkcjonalną dzieci

Table 4. Effect of qualitative variables on functional efficiency in children

	GMFM	GMFCS	MACS
Gender	F(15) = 93.9 ± 94.3 M(18) = 127.6 ± 90.5 NS	F = 3.33 ± 1.88 M = 3.0 ± 1.46 NS	F = 3.4 ± 1.55 M = 3.0 ± 1.41 NS
Epilepsy	Yes(6) = 78.8 ± 67.9 No(27) = 119.7 ± 96.4 NS	Yes = 3.17 ± 1.72 No = 3.15 ± 1.7 NS	Yes = 3.19 ± 1.55 No = 3.17 ± 1.17 NS
Efficiency acc. to the parent	v.low(17) = 54.9 ± 59.0 low(3) = 83.0 ± 8.72 moderate(6) = 173.5 ± 87.3 good(7) = 211.4 ± 69.6 p = 0.001	v.low = 3.94 ± 1.34 low = 4.0 ± 0.0 moderate = 2.33 ± 1.37 good = 1.57 ± 1.51 p = 0.007	v.low = 3.88 ± 1.05 low = 3.67 ± 0.58 moderate = 2.83 ± 1.72 good = 1.57 ± 1.13 p = 0.01
Logical contact	No(16) = 56.9 ± 60.6 Partial(1) = 71 Yes(16) = 169.8 ± 87.3 p = 0.004	No = 4.13 ± 1.15 Partial = 4.0 Yes = 2.13 ± 1.5 p = 0.002	No = 4.13 ± 0.89 Partial = 3.0 Yes = 2.25 ± 1.39 p = 0.002

F-female; M-male; NS = not significant; p < 0.05

Discussion

CP affects many spheres of child's functioning, causing various limitations in their performance. In this syndrome, there occur not only the symptoms of postural and motor disorders but also the accompanying mental impairment, epilepsy and deficits in the sense organs (vision, hearing) [14]. Determining the level of functional efficiency and factors affecting it is important for the assessment of the clinical status, the current level of development, working out the appropriate therapy and for estimating the treatment results [5, 6].

Many researchers and clinicians working with children with CP use scales and tests developed specifically for this clinical syndrome. These include, among others, neurodevelopmental GMFM, analyzing motor skills and acquired locomotion functions and GMFCS created in response to the demand for a standardized system that classifies children with cerebral palsy by their age-specific gross motor activity [10, 11]. MACS [13] is used for the subjective assessment of the use of both hands to handle objects in daily activities.

In our study using GMFCS, the obtained results are highly differentiated, which indicates the diversity of types of CP among children; 42% of children (good motor skills) were qualified to level I and II, whereas the efficiency of the remaining (level IV and V) proved broadly defined limitations in mobility. Similar results were obtained by Michalska et al. In their study 64% of the study group were level IV or V. These children were not able to move independently and they used different types of wheelchairs specially adapted to their individual needs [8]. The results of the research of some authors differ from those obtained in this study. In their reports a higher percentage of children (from 55% to 63%) are level I and II [7, 9, 12]. Differences between our findings and those of other researchers may result from different sample size and type of healthcare facilities (stationary, outpatient) in which the research was carried out.

In this study, the children obtained an average of 42% of possible grades in the GMFM. This is a significantly lower result than that achieved by Waghavkar et al. [15]. Significant disproportions are most likely caused by the difference in the age as well as the gestational age at birth. They can also result from the difference in the group size. Moreover, in our study, the results are significantly



**Zgorzelec,
28-30 marca 2019 r.**

Rejestracja na

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underestimated by children who obtained results equal to or close to zero, which was caused by the occurrence of tetraparesis.

MACS assessment of manual performance in this study indicates that most children had difficulty in handling the objects or the total lack of this ability. This complies with the studies of Michalska et al., where 4-5 scores were obtained by 60% of the group, which indicates a high degree of limitation of the ability to use hands [8]. The results obtained by Morris et al. indicate the dominance of manually efficient children or with slight limitations in this respect - they classified 44 children level I and II which corresponds to 50% of the group [7]. Akpınar et al., investigating 118 Turkish children with various types of CP, found that the MACS level was affected by intellectual delay and epilepsy [16]. In our study, the level of MACS was not affected by coexisting epilepsy, which may result from a small number of children with this comorbidity (18%), whereas children with better verbal-logical contact achieved better results in this scale.

Many researchers observed correlations between GMFCS and MACS which is consistent with the results of our research [16, 17, 18]. This may indicate that the development of visual-motor coordination dependent on the proper development of the hand function, significantly affects the efficiency of other psychomotor skills [6].

There are reports in the literature indicating the effect of spasticity in the lower limbs on the functional skills of children with CP and on their quality of life. This clinical symptom has a direct effect on the obtained GMFCS and GMFM results [19, 20].

There are numerous factors reported that may affect the functional status of children with CP. They include the location of the paralysis and its type, the time of achieving milestones, coexisting diseases, intellectual development and orthopedic complications [21, 22]. According to Jakimowicz, about 30-40% of patients present symptoms that coexist in the form of different degrees of mental retardation, which is in compliance with the results of our research [14]. Among the study group patients - 7 (21%) with diagnosed tetraplegia had mental retardation. This is also in agreement with the results obtained by Michalska et al. They observed a more frequent occurrence of profound mental retardation in children with tetraplegia in comparison to other forms [8].

Choi et al. studied the functional communication profiles in children with CP in relation to intellectual performance and functional scales. They noticed a strong correlation between communication skills and intellectual performance. The communication function was more associated with manual skills than with gross motor function [23].

Conclusions

1. Children with CP present with a diverse range of functional abilities related to gross and fine motor function (from impossibility of movement to high efficiency).

2. High correlation was observed between fine and gross motor function.
3. The results of functional tests were influenced by the duration of pregnancy, birth weight, age and height.
4. Gender and coexisting epilepsy did not affect the test results.
5. Children with better verbal-logical contact achieve better results in the assessed scales.

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Piśmiennictwo/ References

1. Rosenbaum P, Paneth N, Leviton A et al.; A report: the definition and classification of cerebral palsy. *Dev Med Child Neurol* 2007; 49: 480.
2. Kinsner-Ovaskainen A, Lanzoni M, Delobel M, et al.; Surveillance of Cerebral Palsy in Europe Development of the JRC-SCPE Central Database and Public Health Indicators. European Union, 2017; 22-23.
3. Reddihough DS, Collins KJ.; The epidemiology and causes of cerebral palsy. *Aust J of Phys*, 2003; 49: 7-12.
4. Paulson A, Vargus-Adams J.; Overview of Four Functional Classification Systems Commonly Used in Cerebral Palsy. *Children* (Basel), 2017; 4(4): 30.
5. Oeffinger D.J, Tytkowski C.M, Rayens M.K, et al.; Gross Motor Function Classification System and outcome tools for assessing ambulatory cerebral palsy: a multicenter study. *Dev Med Child Neurol*, 2004; 46:311-319.
6. Gajewska E.; Nowe definicje i skale funkcjonalne stosowane w mózgowym porażeniu dziecięcym. *Neurol Dziec*, 2009; 18(35): 67-72.
7. Morris C, Kurinczuk J, Fitzpatrick R, et al.; Reliability of the Manual Ability Classification System for children with cerebral palsy. *Dev Med Child Neurol*, 2006; 48(12): 950-953.
8. Michalska A, Boksa E, Wendorff J, et al.; Jakość życia dzieci i młodzieży z mózgowym porażeniem dziecięcym i niepełnosprawnością intelektualną. Wybrane uwarunkowania społeczno-demograficzne. *Neurol Dziec*, 2012; 21(42): 35-44.
9. Avery LM, Russel D, Rosenbaum P.; Criterion validity of the GMFM-66 item set and the GMFM-66 basal and ceiling approaches for estimating GMFM-66 scores. *Dev Med Child Neurol*, 2013; 55: 534-538.
10. Wood E, Rosenbaum P.; The Gross Motor Classification System for cerebral palsy: a study of reliability and stability over time. *Dev Med. Child Neurol*, 2000; 42:292-296.
11. Rosenbaum P, Walter S, Hanna S, et al.; Prognosis for gross motor function in cerebral palsy: creation of motor development curves. *JAMA*, 2002; 288(11):1357-1363.
12. Beckung E, Carlsson G, Carlsdotter S, et al.; The natural history of gross motor development in children with cerebral palsy aged 1 to 15 years. *Dev Med Child Neurol*, 2007; 49: 751-756.
13. Eliasson AC, Krumlinde-Sundholm ML, Rosblad B, et al.; The manual Ability Classification System (MACS) for children with cerebral palsy: scale development and evidence of validity and reliability. *Dev Med Child Neurol*, 2006; 48(7): 549-54.
14. Jakimowicz W. *Neurologia kliniczna w zarysie*. PZWL, Warszawa 1987.
15. Waghavkar S, Ganvir S. Evaluation of functional motor abilities in preterm children with Gross Motor Function Measure 66. *Indian J Cereb Palsy* 2015; 1 (2):88-93.
16. Akpinar P, Tezel CG, Eliasson AC, et al.; Reliability and cross-cultural validation of the Turkish version of Manual Ability Classification System (MACS) for children with cerebral palsy. *Disabil Rehabil*, 2010; 32(23): 1910-6.
17. Sun D, Wang Q, Hou M, et al.; Clinical characteristics and functional status of children with different subtypes of dyskinetic cerebral palsy. *Medicine*, 2018; 97(21): 1-8.
18. Hidecker MJ, Ho NT, Dodge N, et al.; Inter-relationships of functional status in cerebral palsy: analyzing gross motor function, manual ability, and communication function classification systems in children. *Dev Med Child Neurol*, 2012; 54(8): 737-42.
19. Manikowska F, Jóźwiak M, Idzior M.; Wpływ nasilenia spastyczności na możliwości funkcjonalne dziecka z mózgowym porażeniem. *Neurol Dziec*, 2009; 18(36): 31-35.
20. Idzior M.; Odpowiedź mięśnia na wybrane metody farmakologicznego i chirurgicznego leczenia spastyczności u chorych z mózgowym porażeniem dziecięcym. *Rozprawa doktorska*, Poznań 2005.
21. Campos da Paz A., Burnett S.M., Braga L.W.; Walking prognosis in cerebral palsy: a 22-year retrospective analysis. *Dev Med Child Neurol* 1994;36:130-134.
22. Trahan J., Marcoux S.; Factors associated with the inability of children with cerebral palsy to walk at six years: a retrospective study. *Dev Med Child Neurol* 1995;37:787-795.
23. Choi JY, Park J, Choi YS, et al.; Functional Communication Profiles in Children with Cerebral Palsy in Relation to Gross Motor Function and Manual and Intellectual Ability. *Yonsei Med J*. 2018 Jul;59(5):677-685. doi: 10.3349/ymj.2018.59.5.677