CLINICAL-FUNCTIONAL EVALUATION AND THE REHABILITATION OF CEREBRAL PALSY

- THESIS RESUME -

Scientific Supervisor,
Prof. Univ.
DUMITRU BULUCEA, Ph.D.

Ph. D. Candidate,
MIHAELA
ZĂVĂLEANU

CRAIOVA 2009
SUMMARY

I. THE THEORETICAL STUDY
1. DEFINITION AND CLASSIFICATION OF INFANTILE CEREBRAL PALSY
   1.1. Definition and classification of CP: historical perspective
   1.2. The nowadays classification system of CP
2. RISC FACTORS AND ETHIOLOGY OF CP
3. CP NEUROPATHOLOGY
4. CLINICALLY FUNCTIONAL AND DIAGNOSTICAL CHARACTERISTICS OF CP
   4.1. Clinical form of CP
   4.2. Clinical types of CP
   4.3. The CP diagnostic
5. CEREBRAL PALSY REHABILITATION
   5.1. Current approach in rehabilitation therapy
   5.2. Management of CP case
   5.3. Physical-kinetic therapy
   5.4. Medication for CP
   5.5. Occupational therapy
   5.6. Orthotic therapy
   5.7. Orthopaedic surgical therapy

II. THE SPECIAL PART – PERSONAL CONTRIBUTION
1. MOTIVATIONS AND SPECIFIC OBJECTIVES
2. SPECIFIC PURPOSE AND OBJECTIVES
3. MATERIALS AND METHOD
4. OBTAINED RESULTS
   4.1. Study I – Clinical-epidemiological aspects in infantile cerebral palsy
   4.2. Study II – Complex rehabilitation for the child with spastic cerebral palsy
5. DISCUSSIONS
6. CONCLUSIONS
REFERENCES
ANNEXES

KEY WORD: cerebral palsy, neurodevelopment, etiology, prevalence and distribution, Cerebral Palsy classification systems, Gross Motor Function Classification System, Pediatric Balance Scale, muscular tone, spasticity, dystonia, hypertonia, hypotonia, ataxia, rehabilitation treatment, physical therapy.
INTRODUCTION

Cerebral palsy (CP) describes a group of permanent disorders of the development of movement and posture, causing activity limitation, that are attributed to nonprogressive disturbances that occurred in the developing fetal or infant brain. The motor disorders of cerebral palsy are often accompanied by disturbances of sensation, perception, cognition, communication, and behavior, by epilepsy, and by secondary musculoskeletal problems.

The paper „Clinical-functional evaluation and the rehabilitation of cerebral palsy in children“ has 207 pages: 58 pages were is presented the actual state of knowledge about the cerebral palsy and 149 of personal contribution. The importance of this problem is underline in terms of gravity, epidemiology and functioning factors and rehabilitation therapeutic options.

The first part of the thesis, structured in 5 chapters, focus on the last information concerning the infantile cerebral palsy: definitions, actual classification system, risk factors and etiology, neuropathology, clinical and functional, and diagnostic aspects, the rehabilitation therapy for infantile cerebral palsy.

The second part of this paper – the personal contribution – represent more than two third of the thesis, contain 104 tables and 46 figures. The thesis has six chapters: Objectives, Materials, Methods, Results and Discussion, Conclusions, References and the final appendix.

The mains golds of this work were 1- the study of the epidemiologic, clinical and functional parameters with implications in conceiving and in the evaluation of complex rehabilitation therapy for the child with psiho-neuro-motor disability diagnose with infantile cerebral palsy.

The first Study – The clinical etiological and functional evaluation of a group of children with cerebral palsy in order to identify and analyze the risk factors and epidemiological related factors to realize the clinic-etiologic patterns of the studied child, with importance in establishing the therapeutically needs, elaboration of prophylactic measures for the complications and also to establish the most efficient therapeutic methods. Also the study wants to establish a standard method for the classification and clinical and functional evaluation with implication in establishing the motor abilities and the therapeutically needs, wants to evaluate the impact of etiology on the functional status, wants to correlate the tip (clinical pattern) and the degree of motor impairment with the high
risk factors, and to identify the associated impairments with the cerebral palsy.

The second study - Complex rehabilitation for the child with cerebral palsy has the second objectives: (1) to establish the objectives and the methods of functional rehabilitation in function of clinical localization, functional status and associated impairments, (2) global evaluation of the results of the complex rehabilitation program for the group of children (3) management of the spasticity of the inferior limb (4) the study of the results after the rehabilitation of the lower spastic limb of the child with CP (5) clinical, etiological and functional correlations that can describe the progress of the motor abilities in the therapeutically rehabilitation progression of those children.

81 children diagnosed with cerebral palsy, that have follow after the type of disease and associated impairments, various complex therapeutically programs at the Centres of neuromotor rehabilitation for the child with sever handicap from Craiova and at the Training Centre for Health Care, Prophylactic and Rehabilitation Services from Faculty of Physical Education and Sport-Kinetotherapy, University of Craiova. The determinations were made with the parents and caregivers agree, during the general clinical examination. The subjects’ clinical framing was realised using the classification system described by the Reference and Training Manual of the Surveillance of Cerebral Palsy in Europe (SCPE).

RESULTS

The results from the statistic processing of the data gathered from this work have been presented as comments, tables and graphs assembled around each work hypotheses or group of hypotheses. The results of the statistic processing have been put into 96 tables and 42 graphs which suggestively picture both the descriptive aspects of the epidemiological assessments and the correlations between various parameters in the study.

The objectives and the results of the present work are analyzed and reported to the data in the national and international literature from the field.

CONCLUSIONS

The two studies allow the next conclusions:

- establishing the risk factors in the apparition of cerebral palsy for the group of 81 children, can be use like analogy in the identification and diagnose more rapidly of the cerebral palsy with a essential contribution in the preventive/prophylactic activities and in the suspicion for those that are in charge with the child care,

- It was underline the utility of the use of a common terminology, with availability at the world level regarding the definition, classifications and the clinic-function evaluation
activities for the case with CP in order to identify and establish the objectives and therapeutically method, for the quantification of the rehabilitation results. The classification must be realized by the type of motor anomaly and functional motor level, the two parameters are indicators for the disability level, supplementary in formations regarding the etiological conditions and associated pathology can offer important data concerning the prognostic of this disease.

- The CP etiological aspect for the 81 subjects present some particular aspects, characterized by the big number of children, born on term, with multiple pre/neonatal risk factors (presentation to the birth, APGAR score, hypoxic encephalopathy, neonatal seizures, birth in the hospital or at home). The incidence of the premature children is relative reduce in comparison with the studies from special literature, that can by a lack in the assistive birth services and care of the new-born child.

- The age of establishing the CP diagnostic and rehabilitation treatment was relatively high for the research group; a big number of children can’t have access to the complex specialized rehabilitation treatment and diagnostic services.

- The clinical and functional evaluation for the research group demonstrate a net dominancy for the spastic tip of CP with an deficit function, with a sever impaired motor alteration (specially for spastic paraparesis and tetrapareis) at the analytical examinations (spasticity score, ROM, reflexes) and at the global evaluations (balance, gross motor abilities) with an reduce score GMFCS (III, IV and V) for a large group of children.

- We underline for all the spastic CP case an medium disturbance more severe for the right upper or inferior limb. Regarding the associated impairments, a large group of the children presented epilepsy (more frequent the generalised form), moderate and severe alimentary disturbance but with a good nutritional status, has presented modification of the posture and spine (especially the cases with spastic paraparesis) with predominance of kypho-scoliosis. The visual disability was more frequent in the cases with para and tetraparesis, the mental and speech retardation, the impact of multiple associated impairments having an obvious impact in the functional motor level of the research group of subjects.

- The rehabilitation therapy benefit for a long term, 2 years, were less obvious at the analytical parameter (reflexes, spasticity) but were more significant for the range of motion of the joint of spastic limb, the progresses were registered at the global evaluations: BBS score and GMFM score, an big percent of children changing for a superior function GMFCS level.
- The principal parameters for the CP case in order to independent gait were: the risk factors (in order to establish an reserved or a negative prognosis): the topography of the spasticity of the lower limb (paraparesis and tetraparesis), the presence of associated disabilities (epilepsy, mental retardation, visual disabilities), the increase spasticity level for the flexor muscles of lower limb, the progress factors (in order to establish an good prognosis): the decrease media of the spasticity score between the moments of evaluations, the increase medium value of the ROM for the lower limb joints from one evaluation to the other, the greater BBS score.
CURICULUM VITAE

ZĂVĂLEANU MIHAELA

Place and date of birth: 17 August 1977, Craiova, Dolj, Romania
Mail: mihaela.zavaleanu@yahoo.com
Phone number: 0723 52 13 87, 0749 23 97 31

PROFESSIONAL ACTIVITY
- 2005 until now: Resident, speciality: Physical Medicine Rehabilitation and Balneotherapy, Clinical Departmental Hospital, Craiova
- 1996-2002: Student of University of Medicine and Pharmacy – Faculty of Medicine – Craiova
- 2002- 2008, University of Craiova, Faculty of Physical Education and Sports, Junior lecture
- 2008 University of Craiova, Faculty of Physical Education and Sports, assistant professor

PROFESSIONAL AFFILIATIONS
- Romanian Society of Physical Medicine and Rehabilitation from 2005;
- Research Centre of Human Motricity - FEFS CRAIOVA from 2005;
- Romanian Association for the study of Pain from 2004-2006
- European Society of Physical and Rehabilitation Medicine ESPRM from 2007
- International Society on Early Intervention ISEI form 2007
- International Physical Activity and the Environment Network IPEN from 2007

LANGUGES: English, French

IMPORTANT CONGRESSES, COFERENCES AND SYMPOSIA PARTICIPATION
- 16th European Congress of Physical and Rehabilitation Medicine, 3 - 6 June, 2008, Brugge, Belgium
- International Scientifically Conference „Physic exercise complex and modern modality for promote health”, 6-8 June, 2008, Craiova Romania
- Conference: „Medicals days of Brasov” organized by University Transilvania Brasov, Faculty of Medicine Braşov, 7-8 December 2007, Braşov
- National Symposium of Scientifically Medical Research of Excellency, 25 – 26 October 2007 Sibiu, Romania,
- The 17th Session of the Balkan Medical Days/La 17ème Session des Journées Medicales Balkaniques, 12-14 September 2007
- International Conference, „The science of motric activities”, Piteşti, 23 November 2007,
- The IIrd Balkanic Congress of Kinetotherapy: „Europeans Standards in Balkan Kinetotherapy”, Oradea-Bâlle Felix, 10-14 May 2006,
- The Vth National Congress of Kinetotherapy: Romanian Kinetotherapy and Francophone, 5-7 October 2005 Bucureşti,

IMPORTANT PUBLISHED SCIENTIFIC PAPERS
A. PUBLISHED BOOKS
* Mihaela Zăvăleanu „Practice lessons of medical rehabilitation of patients with respiratory disease”, Ed. Universitaria, Craiova, 2004;
B. MAIN SCIENTIFIC PAPERS PUBLISHED AND COMMUNICATED


7. ROŞULESCU E., AVRAMESCU T., ZAVALEANU M., ENESCU D. – Lower limb management of the spasticity in infantile spastic quadriplegia, National Symposium of Scientifically Medical Research of Excellency, 25 – 26 October 2007 Sibiu, Romania,

8. MIHAELA ZĂVĂLEANU, EUGENIA ROŞULESCU, DUMITRU BULUCEA, SUZANA DĂNOIU – The evaluation of nutritional status in a group of child with cerebral palsy, Conference: „Medicals days of Brasov” organized by University Transilvania Brasov, Faculty of Medicine Braşov, 7-8 December 2007, Braşov


11. ZĂVĂLEANU M., ROŞULESCU E., CĂLINA M., BIERU ENESCU D., - Cerebral palsy and sport for health and social interation, Conferin a Ştiin ifică Interna ională „Exerci iul fizic mijloc complex şi modern de promovarea sănătăţii”, 6-8 Iunie, 2008, Craiova România


22. Eugenia Roșulescu, C. Stanoiu, E. Buteica, B.Stanoiu, M. Zavăleanu, F.Burada, A. Enescu. Pathologic changes in two cases with hereditary spastic paraplegia. in press; accepted for publ. 2009 in Romanian Journal of Morphology and Embryology no.50(2), ISSN 1220-0522, cod CNCSIS 772, indexat ISI Thomson, Medline, PubMed. (accepted for publiction)

23. E. Buteică, Eugenia Roșulescu, A. Enescu, M. Zăvăleanu, F. Burada. Ethical considerations in pediatric genetic testing. in press; accepted for publ. 2009 în Revista Română de Bioetică, ISSN 1583-5170, cod CNCSIS 593, indexat ISI Thomson. (accepted for publication)
