

Development and Differentiation in Childhood Disability



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European Academy of Childhood Disability
University Medical Center Groningen
and Martini Church
Groningen, The Netherlands



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Objective. The objective was to investigate the effect of a modified form of physical training on the aerobic endurance and the walking ability of 13 children aged between 8 and 13 years with a CP and the ability to walk independently. All children were from the school for the handicapped, affiliated to the Roessingh rehabilitation center. It is an intervention study with a follow-up period of 11 weeks.

Methods. Inclusion criteria: CP; GMFCS level 1 or 2; student at the above mentioned school, cognitive level: normal intelligence or mild retardation.

Exclusion criteria: Orthopaedic interventions or treatment with botulinum toxin injections within 3 months before start of the study; genetic abnormalities, neurological abnormalities in addition to CP; serious behaviour problems, and part taking in physical training within 6 months before start of the study.

Intervention: The intervention consisted of a physical training program of 9 weeks with a mean frequency of 2 times weekly. The training consisted of a circuit with 4 stations and lasted 30 minutes. It addressed aerobic endurance, walking distance, walking velocity and ambulation.

Instruments: Bruce, 6-minute-run test, TUDS and MOVRA

Measurement moments: 2 weeks before start, immediately after and 11 weeks after the end of the intervention.

The MOVRA is only used before the start of and immediately after the intervention.

Results. Soon after the intervention there was a significant improvement of the aerobic endurance (HR6), the walking distance and the ambulation. Immediately after the intervention the maximum endurance time has not changed, but 11 weeks later it has improved significantly.

The ambulation at home, measured with the MOVRA, improved however, the improvement was only limited to the items the training addressed.

Conclusion. This modified form of aerobic physical training for 30 minutes during 9 weeks with a mean frequency of 2 times weekly improves the aerobic endurance capacity and the functional walking ability of children between 8 and 13 years with a CP who can walk independently.

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PRESCRIPTION OF THE FIRST PROSTHESIS AND LATER USE IN CHILDREN WITH CONGENITAL UNILATERAL UPPER LIMB DEFICIENCY. A SYSTEMATIC REVIEW

Objective. To reveal whether scientific evidence is available in the literature to confirm the hypothesis that the first prosthesis of children with an upper limb deficiency should be prescribed before two years of age in order to achieve lower rejection rates and better functional outcomes.

Methods. A computerized search was performed in several databases: Medline, Embase, Cinahl, Amed, Psycinfo, PiCarta and the Cochrane database. A combination of the following keywords and

their synonyms was used: "prostheses, upper limb, upper extremity, arm and congenital". Furthermore, references of conference reports, references of most relevant studies, citations of most relevant studies and related articles were checked for relevancy.

Results. The search yielded 285 publications, of which four studies met the selection criteria. The methodological quality of the studies was low. All studies showed a trend of lower rejection rates in children who were provided with their first prosthesis at less than two years of age. Two studies allowed for the calculation of a pooled odds ratio: the pooling revealed a higher rejection rate in children who were fitted over two years of age (pooled OR=3,6 95%CI 1,6-8,0).

Conclusions. In the literature no clear evidence was found for a relationship between the age the first prosthesis should be prescribed in children with a congenital upper limb deficiency and rejection rates or functional outcomes. As such, clinical practice of introduction of a prosthesis is guided by clinical experience rather than by evidence based medicine. Theoretically, it may be argued that fitting a prosthesis at early age, when the brain shows substantial plasticity, will result in less rejection and better functional outcome than fitting at later age.

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MEASURING BONE MINERAL DENSITY IN CHILDREN WITH SEVERE GENERALIZED CEREBRAL PALSY

Objective. Children with severe generalized cerebral palsy (GCP) have an increased incidence of (low impact) fractures. Risk factors for low bone mineral density (BMD) are often present in this group of severely handicapped children. With increasing life-span by improvement of medical care, the prevalence of low BMD will increase, while the diagnosis and treatment of fractures and low BMD in these children is difficult. Customary diagnostic methods are often poorly applicable. An alternative method for these patients might be Digital X-ray Radiogrammetry (DXR) that measures BMD of the second to fourth metacarpal of the hand, by using an X-ray of the hand. In other groups, DXR correlates well with Dual Energy X-ray Absorptiometry (DEXA).

Methods. In this pilot study we performed DXR on 14 radiographs of the hand, obtained from 14 children with GCP. Mean age of the children was 14.2 yr (6-21 yr, 7 boys, 7 girls).

Results. Seven children were diagnosed with a BMD of more than 2 SD below the mean value for their bone-age. The mean BMD SDS was -2.02 (SD 1.38).

Conclusions. A low BMD, measured with DXR, is often diagnosed in children with GCP. DXR is a feasible method of measuring BMD in children.

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STANDARDIZATION IN PEDIATRIC REHABILITATION. MULTILINGUALITY AND INFORMATION SHARING ISSUES

Background. Rehabilitation is a long-lasting process conducted in different institutions often even in different countries. To achieve desired outcome healthcare providers must no longer work in isolation, but need to collaborate as a team, if necessary beyond the national and linguistic borders. Therefore development of examination standards using unified terminology for information sharing is an urgent issue. Information and communication technologies can facilitate this cooperation.

Objective. Development of examination standards for cerebral palsy patients using unified terminology and its implementation in the electronic medical record in the International Clinic of Rehabilitation.

Methods. Our medical experts have worked out diagnostics algorithm for examination of patients with cerebral palsy. Sequence of questions and answers have been organized in the hierarchical tree including over 2.5 thousand nodes. Each term or phrase in Ukrainian has a corresponding term in other languages – Russian, English and German. According to the diagnostics algorithm, electronic medical record has been modified.

Results. Introduction of standard examinations in electronic medical records ensure reduction of medical errors and speed up data input. Unified multilingual terminology helps us to develop a software tool for automatic preparation of medical discharge reports in different languages. Storing medical information in a structured way opens wide possibilities for data processing and monitoring patients condition during the rehabilitation.

Conclusions. Development of international standards for evaluation of patients using unified terminology helps to improve health care and its continuity. This task needs joint work of medical professionals of different institutions and different countries.

Theme 6: Different and CP-Related Disabilities

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IMMEDIATE MEMORY, PROCESSES OF LEARNING AND THEIRS EFFICACY IN CHILDREN AND ADOLESCENTS WITH SLEEPDISORDERS AND EPILEPSY. PRELIMINARY REPORT

The prevalence of the sleep disorders estimates as 30% of children and adolescents of general population. Symptoms of SD may be conditioned multifactor. We are still not able to precise the physiological role of sleep in human life. But it has been observed that even subtle, small qualitative and quantitative changes in sleep can have significant impact on the patient's health state. The basal and most comprehensive classification is the International Classification of Sleep Disorders (ICSD) created in 1990 with revision from 2005. The aim of the study was to evaluate the abilities the efficacy of learning and short term memory – visual and auditory in children and adolescents with sleep disorders and epilepsy. The questionnaire of own construction and neuropsychological tests of short-

term memory and abilities of learning were used in the study.

45 pts aged 8-18 yrs of age with epilepsy participated in the study. 16 of them have sleep disorders. The V Kramer Test, Phi Parameter, correlation, Mann-Whitney Test were used in the statistical analysis. The level of statistical significance was 0,05 for nonparametric tests. The results show significant decrease in the levels of cognitive functioning of pts with epilepsy and SD in comparison to the control group. This is the main reason of participation of pts in neuropsychological therapy as well.

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CEREBROVASCULAR DISEASE IN CHILDREN: A STUDY OF AUDITORY PROCESSING

Cerebrovascular disease (CVD) is rarely found in childhood. With a varied etiology, its evolution has evidenced behavioral, cognitive, speech and learning changes. Little has been investigated about auditory function, responsible for abilities conferring competence to the interpretation of acoustic events.

Objective. Describe auditory processing in CVD children.

Methods. It included 23 subjects, from 7 to 16 years old, with unilateral CVD, paired with right-handed children of the same sex, age and socio-economic level. They presented auditory sensitivity, speech, attention levels and cognitive function compatible with tasks. Auditory evaluation tests performed: sound localization (SL), verbal and non-verbal sequential memory; speech in noise (SN), filtered speech (FS); non-verbal dichotic (NVD), consonant-vowel (CV), dichotic digits (DD), staggered spondaic word (SSW); pitch pattern sequence (PPS), duration pattern sequence (DPS).

Results. Adequate results for SL, SN, FS. Reduction in capacity to retain verbal and non-verbal items in memory was found. DNV presented asymmetrical responses for ears in free recall task and difficulty to focus in directed attention stage. For CV, varying direction of perceptual asymmetry in free recall stage, and difficulty to focus in directed attention stage. Ipsilateral, contralateral or bilateral changes in respect to the affected hemisphere in DD and SSW. Subjects showed difficulty to organize acoustic events in PPS and DPS. **Conclusions.** Children with CVD presented impairments in memory, selective attention and time processing abilities.

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GOAL-SETTING IN FUNCTIONAL, GOAL-DIRECTED TRAINING IN PRESCHOOL CHILDREN WITH CEREBRAL PALSY (CP)

Objective. To study the parent's choice of goal-areas, goal-attainment and how the goals relate to the PEDI domains and the GMFCS-66.

Methods. 2 children (11 girls, 11 boys) with CP, aged 1-6 years, GMFCS I-IV participated in a 12-week intervention of functional, goal-direct-