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ABSTRACTS

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P160

CEREBRAL PALSY: MEDICO-ECONOMIC POSSIBILITIES FOR EARLY DIAGNOSIS AND COMPLEX NEUROHABILITATION – THE BULGARIAN MODEL

Chavdarov I.

Spec. Hospital for Children with Cerebral Palsy 'St. Sofia', Administration, Sofia, Bulgaria

Cerebral palsy (CP) is a well-known disease consisting of many specific problems in different fields of brain activities and the whole body. Solving all these problems is a delicate matter that depends on the acquired medical knowledge and experience, the available technical aid and devices and social-economic environment in every single country, which is hinting the answer there is no widespread or universal model. The goal of this paper is to introduce the Bulgarian Model. The Specialized Hospital for Children with Cerebral Palsy was established in 1989. In 2003 a Medical Centre for Children Neuro-Habilitation was founded. A consensus paper for diagnosis, therapy, rehabilitation and service of children with CP was published in 2006. The first step of CP-prevention in post-natal time, is organized by observation of the high-risk groups of newborns (pre-matured, very low-birth weight, birth asphyxia, brain haemorrhage, twins) with screenings by early Neuro-Kinesiological Diagnosis according V. Vojta (defining the group of 'CP-risk infants') and if necessary an early intervention is started within first trimenon using the methods of Physical Medicine and Rehabilitation, including physiotherapy, magnetic field, hyperbaric oxygenation, feeding-therapy and others. The second step is the time-border zone for confirmation of CP as a 'fixed' diagnosis by one year and six months of age. A team of professionals developed the strategy of complex medico-pedagogical rehabilitation according to the form, clinical picture and severity of CP and the personal needs of the child. The National Health Insurance Fund (NHIF) renders a payment to the hospital for treatment of CP for 10 consecutive days (3 therapeutic procedures daily) on a monthly basis for 'CP-risk infants' aged 0 to 1.5 years and for 'fixed' CP aged 1.5 to 18 years. As far as children over 18 years old are concerned, NHIF pays 4 courses per year with a 10-days duration consisting of 3 procedures daily. Speaking of CP-children under 18 years old from the Sofia city, it is the Sofia Municipality that pays to the hospital for the rest of the days of the month, during which these children have been treated in the hospital. The model of CP-service (facilities, staff and payment) in Sofia is used for the establishment of similar models in Bulgaria.

P161

EFFECTS OF MUSCLE STRENGTHENING AND ELECTRICAL STIMULATION ON LOWER LIMB KINEMATICS IN CHILDREN WITH PARAPLEGIC CEREBRAL PALSY

Rosulescu E.¹, Zavaleanu M.¹, Avramescu T.¹, Danoiu S.², Gruionu L.³, Dragomir M.¹

¹Dept. of Physical Therapy, ²Computational Biomechanics Group, University of Craiova; ³Physiopathology Dept., University of Medicine Craiova, Romania

Introduction: In children with cerebral palsy muscle imbalance have been suggested to be a major component of gait disorder. **Aim:** The purpose of this prospective study was to determine if strengthening and electrical stimulation (ES) of the gluteus maximus, rectus femoris and plantar dorsiflexors would improve lower limb kinematics measured by motion analysis in children with paraplegic cerebral palsy. **Patients and Methods:** 12 children (aged 7 to 14 years) with spastic paraplegia received ES therapy applied to the gluteus maximus, rectus femoris and tibialis anterior muscle, 20 min sessions bilateral for each muscle, bipolar

technique, intensity sufficient to produce the desired movement, and a strengthening exercise program, daily, for six weeks, followed by a two month control period. The children were video recorded before (pre-test) and after rehabilitation (post-test), one and two months later. Data were collected and analysed with SIMI Motion and we looked for biomechanical parameters which are relevant for the improvement of the walking movement. **Results:** After the treatment the kinematic analysis showed an increase in bilateral hip and knee extension, ankle dorsiflexion but no improvement of hip internal rotation throughout the gait cycle. Popliteal angle, knee flexion at initial contact was decreased and statistically significant improvement ($p < 0.05$) occurred in ankle dorsiflexion at initial contact, midstance and midswing between the first and the subsequent tests. There was no significant correlation between plantar extension or flexion and hip internal rotation and pelvis kinematics before and after the rehabilitation program. **Conclusion:** This study demonstrates that muscle strengthening exercise program combined with ES is useful in improving gait in children with paraplegic cerebral palsy and may allow them to walk more efficiently. Also suggests that children with spastic paraplegia with significant internal rotation gait should have a more comprehensive analysis and other therapeutic options (orthotic and surgical) besides a muscle rehabilitation training program.

P162

APPLICATION OF MANUAL MASSAGE IN PAIN THERAPY IN CHILDREN

Savic K.¹, Lačkova J.², Krasnik R.¹, Vujić R.¹

¹Institute for Child and Youth Health Care of Vojvodina, Clinic of Child Habilitation and Rehabilitation, Novi Sad; ²Health Center, Bač, Republic of Serbia

Introduction: Manual massage therapy is one of the oldest and most appropriate methods of applying mechanical energy onto the human body. From a therapeutic point of view, it is aimed at pain relief, improvement of circulation and metabolic processes, as well as recovery of impaired functions. Massage dose is individually adjusted; however, numerous factors are to be taken into consideration, above all the age of the patient. Young patients and elderly, exhausted individuals are more sensitive to massage effects, thus the time required for achieving positive effects is shorter. **Aim:** The aim of this study was to confirm the positive effects of manual massage in the pain therapy in children. **Patients and Methods:** Twenty patients, aged 12 to 18 years, with pain in a lumbosacral region, were monitored at the Clinic. The patients were distributed into two groups. Group 1 (10 patients) was subjected to electrotherapeutic procedures (interference current) because of heavy pain. Group 2 (10 patients) received IF electricity along with the daily massage applying Fastum gel (Ketoprofen). Patients from both groups were treated during ten days, receiving one procedure daily (interference current or combination of electrotherapy and massage). The procedure was applied in the painful paravertebral musculature of the lumbosacral region. The pain intensity was monitored using McGill Pain-Questionnaire and Scott-Huskisson Visual Analog Scale. **Results:** After ten-day therapy considerable analgesic effect was noticed in 60% of patients from the Group 1. Significant pain relief was observed in patients from Group 2 yet after five days of therapy and after last treatment (on Day 10) complete pain relief was observed in 80% of patients. **Conclusion:** Clinical monitoring of 20 patients at the Clinic of Child Habilitation and Rehabilitation and the obtained results revealed that manual massage, combined with other therapeutic procedures, proved effective method in the pain therapy.

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