

Complex neurorehabilitation algorithms for functional recovery and amelioration of autonomy in everyday life of patients with neurological disabilities

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Author discusses the problem of functional recovery of neurological sensitive, motor and functional disturbances. The goal was to evaluate the efficacy of application of different neurorehabilitation modalities and methods on everyday autonomy and quality of life of patients with disabilities due to socially important invalidating neurological diseases. We effectuate a composition, clinical application and approbation series of complex neurorehabilitation algorithms for functional recovery and amelioration of independence in daily living of a total of 1249 neurological patients, divided into a lot of groups and subgroups. In each one, we applied a different neurorehabilitation (NeuroReh) complex, composed by a synergic combination of natural and pre-formed physical modalities (electrotherapy, cryo and thermotherapy, physiotherapy and occupational therapy). Patients were controlled before, during, at the end of the NeuroReh course and one month later - using a battery of traditional and contemporaneous objective methods such as tests and scales for motor weakness, balance and coordination; tests of functional grip; tests of gait and independent motion; functional scales for independence in daily living and capacity for activities (self-service, family life, professional, social); scales for depression and anxiety; visual analogue scale of pain; vibroesthesiometry; thermosensibility; laser Doppler flowmetry. Based on detailed qualitative and quantitative evaluation, we proved the efficacy of different neurorehabilitation complexes – on different types and levels of sensory, motor and functional deficiency in patients with post-stroke hemiparesis (including hemiparetic shoulder), multiple sclerosis, parkinsonism, discogenic radiculopathy L5 with peroneal paresis, diabetic polyneuropathy with peroneal paresis and neuropathic diabetic podopathy. Parkinsonism (Prk) is a neurodegenerative disorder, considered as a socially important disease with serious decline in autonomy and quality of life of patients.

Introduction-

Parkinsonism (Prk) is a Neurodegenerative disorder, first described by Dr James Parkinson in 1817 as Shaking Palsy or Paralysis Agitans [1] and nowadays considered as a socially important disorder with inevitable progression and serious impact on autonomy and quality of life of patients [2].

Primary clinical patterns of Parkinsonic disease (PD) include: Static tremor, Muscle rigidity (Muscular and articular stiffness), Bradykinesia and Hypokinesia (including Hypomimia or Amimia), typical Prk-posture and Prk-gait, postural instability with pulsion phenomena (Antepulsion, Retropulsion, Lateropulsion) and frequent falls; Dysarthria and Dystonia [3,4]. There is a lot of non-motor autonomic and psychic signs and symptoms, especially Anxiety, depression, Apathy, Day-

time somnolence and Insomnia; Pain, Fatigue, and (in some cases) dementia [3,5]. In advanced Prk-cases many movement problems are observed, e.g. freezing and on-off phenomena; peek-of-dose-dyskinesias; etc.

Routinely, the management of Prk includes predominantly drugs, functional neurosurgery and physiotherapy [4, 6-10]. The progressive degeneration with the subsequent early death of Dopaminergic neurons in the region of substantia nigra and the accumulation of the protein alpha-synuclein with the subsequent formation of Lewy bodies are the targets of many pharmaceuticals (applied as Monotherapy or in combination): Levodopa, Dopamine agonists, MAO-B inhibitors, COMT-inhibitors, cerebro-protectors, ultimately-Vitamin B12, homocysteine, etc. Other authors propose transplantation of Dopaminergic tissue, use of Stem-cells, Gene-therapy or growth factor delivery in specific brain regions; stereotaxic thalamotomy, Deep brain stimulation, etc.

For satisfaction of typical patients' and families' concern, some patients' organizations and associations suggest supportive therapies (as physiotherapy, occupational therapy, speech therapy, specific diet) and complementary therapies without sufficient scientific evidence (art-therapy, music therapy, Shiatsu, Reiki, massage, aroma-therapy, homeopathy, Bowen technique, etc.) [11].

In this field, the holistic approach of Physical and rehabilitation medicine (PRM) and of Neurorehabilitation (NR) may be convenient. Traditionally, the rehabilitation in PD includes physiotherapy and, in some cases, training in everyday activities [12].

During last years, our interest was oriented to the potential of Neurorehabilitation (NR) [13]. We elaborated a NR-program, adapted to dysfunctions and everyday problems of Prk-patients. The program includes Physiotherapy, Ergotherapy & patients' education: exercises for paravertebral muscles and for extremities; soft tissue techniques for rigid muscles; balance, transfer and coordination training; grasp and gait training; speech and mimic exercises; training in activities of daily living [14].

Our objective was to combine different natural and preformed physical modalities and to estimate the efficacy of application of different neurorehabilitation methods on independence in activities of daily living (ADL) and on quality of life (QoL) of these patients. We must underline that the NR in PD is a team work of many medical specialists (medical doctors-specialists in Neurology, PRM, Gerontology) and health professionals (nurse, physical therapist, occupational therapist, speech therapist, neuropsychologist).

The GOAL of current study was to evaluate qualitatively and quantitatively the impact of some preformed physical

modalities [as Electrical Stimulations (ES) and Deep Oscillation (DO)] in the complex neurorehabilitation (NR) program in Prk-patients.

Materials & Methods:

We observed 170 Prk-patients, covering the criteria of the Unified Parkinson's Disease Rating Scale (UPDRS); randomized into five therapeutic groups (gr). In gr-1 we applied traditional physiotherapy (control group); In gr-2 a complex NR-programme, including physiotherapy, Ergotherapy & patients' education. In patients of next groups, we added preformed physical modalities: In gr-3-electrical stimulations (ES) for feet extensors and flexors; in gr-4-Deep Oscillation (DO) paravertebrally; in gr-5-ES and DO.

For database management we used parametrical analysis (t-test-analysis of variances ANOVA) and non-parametric distribution analysis (Wilcoxon signed rank test); performed using SPSS package. The treatment difference was considered statistically significant if the P value was <0.05.

Results: Results demonstrate statistically significant amelioration (in alleexperimental groups) concerning: brady-hypo-kinesia; gaitstability, pulsionphenomena (especiallyretropulsio); Hoehn and Yahr scale; Depression and Anxiety. Paravertebral pain, Rigidity (muscular and articularstiffness) and Prk-posture were most significantly influenced in gr-4 and gr-5. In gr-3 and gr-5 weperceivedmostimportantimprovement of autonomy in differentactivities, Timed Up and Go test, etc.

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Keywords-Parkinsonism; Neurorehabilitation; Functional electrostimulation; Deep oscillation; Autonomy in activities of daily living, Quality of life

Conclusion: We recommend our own NR programme, including Physiotherapy, Occupational therapy, ES and DO; useful for the autonomy in activities of daily living of Parkinonic patients.

References-

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