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Editorial

Rehabilitation of Children with Cerebral Palsy

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Cerebral Palsy

Cerebral palsy (CP) is a well-recognized neurodevelopment condition beginning in early childhood and persisting through the lifespan. It was originally reported by J. Little in 1861 (but not then called 'cerebral palsy'), CP has been the subject of books and papers by some of the most eminent medical minds of the past hundred years. Beginning at the end of the 19th century Sigmund Freud and Sir William Osler both contributed important perspectives on the condition. From the mid-1940s the founding fathers of the American Academy for Cerebral Palsy and Developmental Medicine (Carlson, Crothers, Deaver, Fay, Perlstein, and Phelps) in the United States, and Mac Keith, Polani, Bax and Ingram of the Little Club in the United Kingdom, were among the leaders who moved the concepts and descriptions of CP forward.

It has always been a challenge to define 'cerebral palsy'

One of definition used at present is the definition of CP from the Washington Workshop 2004: "Cerebral palsy describes a group of developmental disorders of movement and posture, causing activity restriction or disability, which is attributed to disturbances occurring in the foetal or infant brain. The motor impairment may be accompanied by a seizure disorder and by impairment of sensation, cognition, communication and/or behaviour." (Washington, 2004).

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But also definition published in 1992 is still in use and probably it is the best concise: "Cerebral palsy is an umbrella term covering a group of non-progressive, but often changing motor impairment syndromes secondary to lesions or anomalies of the brain arising in the early stages of its development" (Mutch LW, Alberman E, Hagberg B, Kodama K, Velickovic MV. Cerebral palsy epidemiology: where are we now and where are we going? Developmental Medicine and Child Neurology. 1992. 34: 547-555.).

CP is the most frequent motor impairment in childhood but it should be seen that it is more than merely a motor disorder. There can be problems of development, perceptual-cognitive impairment, social and functional problems of daily living, emotional and behavioural problems, and many other difficulties. In addition to this, early brain damage is not a synonym of CP.

There are an estimated 18 million people with CP around the world and more than half of them are mentally retarded and one third of them have epilepsy.

How to treat a person with cerebral palsy?

"There is little or no evidence to support the effectiveness of any particular approach, nor is there evidence to demonstrate superiority of one approach over another" (M. Mayston, MDCN 2005:47:795).

The only one »best« treatment for all problems of people with CP does not exist, but there is no doubt that if we start to treat a problem early on; we will achieve better results….

We should start early to intervene (if possible before three month of age) because the brain is most plastic while brain development is most rapid.

An adequate intervention means also an early detection; consequently, early diagnosis is crucial.

Screening test is not a neurological examination and good surveillance does not necessarily ensure the making of the right decisions, but it reduces

the chances of wrong ones. Long term follow up of the baby should be regarded as an integral and essential part of well-designed trials of interventions in the perinatal field.

Having in mind a broad spectrum of differences in age of people at which firm diagnosis is made, inclusions and exclusions criteria, denominator for clinical features (topographical or other classification), and especially what was a cause and timing of insult, size and location of lesion, maturational state of system injured, integrity of areas surrounding and contralateral to lesion, genetic and environmental background, gene-gene and gene-environment interactions, and intervening conditions (timing of start, quality, duration and intensity), and that we do not know what are the potentials of the developing brain of the individual child to adapt to and to compensate for the damage, it is obvious that there are currently no evidence-based strategies for preventing CP and to say which method of treatment is superior. In addition to this fact we should find a balance between physiotherapy (among them nowadays the most used Neurodevelopment treatment – Bobath, Vojta, Conductive education and Constrain induced movement therapy), speech therapy and occupational therapy and many other approaches used nowadays in the world.

Oral Pharmacotherapy (Benzodiazepine, Dantrolene, Baclofen, and many others), Neurosurgical approaches, Local anaesthetics and Local neurolytics (Alcohol, Phenol, Botulinum toxin, Baclofen pump, Selective dorsal rhizotomy, Peripheral neurectomy, ...), Electrical stimulation (Peripheral as is Functional Electrical Stimulation (FES) and Central as are Deep brain stimulation and Dorsal column electrical stimulation), Orthoses (Splints, callipers, braces, supports, trusses, casts), Stretching regime to maintain joint range, Surgery for muscle length and bone misalignments, just to mention some of them. Beside this there are not many proven therapies (Biofeedback, Functional Motor Learning, Acupuncture, the “Adeli” suit, hyperbaric oxygenation, Homeopathy, Bio-energy, and others).

We should always take in account also Complementary and Alternative Treatment (Definition of it is: A group of diverse medical and health care systems, practices, and products that are not presently considered to be part of conventional medicine. The list of what is considered to be CAM changes continually, as those therapies that are proven to be safe and effective become adopted into conventional health care and as new approaches to health care emerge) and a Placebo effect.

A new hope for the brain disorders in the 21st century? Stem cells - to repopulate brain, Transplantation? Is it realistic? Can we use source of donor cells for transplantation, directed at replacement of a specific cell type lost in neurodegenerative diseases, vectors for gene therapy, not only for genetic disorders, but also for replacing specific therapeutic gene products that might help repair brain tissue, and endogenous source for cell replacement? In addition, once transplanted, stem cells have been shown to survive, migrate, and differentiate. Indeed, there is now ample evidence that stem cells exist in the central nervous system throughout life, and the progeny of these stem cells may have the ability to assume the functional role of neural cells that have been lost.

We should follow principles of up-to-date therapeutic approaches in the field of 'Evidence based medicine' but we should respect also the traditional and every day approaches used when advanced services provided in developing countries are not available. Dogma is a dictatorship of ideology; especially in treatment approaches. It should be omitted. But wrong ideas are worse than ignorance, too!

Treatment of CP must be individualized to each child’s needs and must involve parents to teach them effective approaches to apply at home. It should be a holistic approach and we should look on quality of movement patterns and especially on quality of life of a person we are treating. International Classification of Functioning, Disability and Health should be used for assessing the present status of person in a process of treatment and having in mind a goal of the treatment.

For the most part, there are key questions that are yet to be answered through well-designed scientific studies.

In Conclusion

Advances in medical and surgical management are accelerating at a rapid pace. The only one "best" treatment for all problems of people with CP does not exist, but there is no doubt that if we start to treat a problem early on, we will achieve better results. The Early treatment of an infant with abnormal neurological signs is not the same as a treatment of different signs and symptoms of CP!

Ideally we should start with therapeutic intervention before abnormal movement patterns become dominant and habitual.

Progress in the treatment of children and adults with CP is a task of exceptional human value and we should do our best to minimize their problems. Brain function is shaped by the interaction of Nature and Nurture and Human Brain is especially designed to be influenced by signals from the Environment.