HOW TO CLASSIFY CHILDREN WITH CEREBRAL PALSY HOLISTICALLY?

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BACKGROUND

- Children with cerebral palsy (CP) present with heterogeneous features
- The prevailing classification systems classify children with CP primarily based on any one particular feature i.e distribution of involvement,1 motor disorder,2,3 gross motor function,4,5 manual function,6,7 or communication function8
- Identifying subtypes to classify children with CP on multiple variables is an important step in establishing a meaningful, holistic classification system

FRAMEWORK FOR MULTIVARIATE CLASSIFICATION

- Comprehensive Severity Index9
- Body Function Index in Cerebral Palsy

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<th>Disease specific informed by ICD</th>
<th>Condition Specific informed by ICF</th>
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Measures severity - negative focus - based on physiological signs and symptoms and laboratory measures
Measures function - positive focus - based on neuro-musculoskeletal and associated co-morbid health conditions using clinical measures

ICD - International Classification of Diseases; ICF – International Classification of Functioning, Disability and Health

PRELIMINARY STUDY

- Selected childhood neurodisabilities [i.e CP, Developmental Co-ordination Disorder (DCD), Autism Spectrum Disorders (ASD)]

Summary of the results of preliminary study:
- Primarily used cluster analysis for classifying children with DCD and ASD
- None of the classifications addressed all of the key features of the disorder
- Classifications presented with variable psychometric properties
- Classification systems in CP and ASD served dual purposes of examination and prognosis
- Variability in addressing developmental aspects
- Only classification systems of CP are feasible to classify children with DCD and ASD

MEASURES

The following measures were used in developing two versions of the BFI-CP

- Modified Ashworth Scale (MAS)10
- Distribution of involvement11
- Early Clinical Assessment of Balance (ECAB)12
- Functional Strength Assessment (FSA)
- Spinal Alignment and Range of Motion Measure (SAROMM)13
- Early Activity Scale for Endurance (EASE)14
- Health Conditions Questionnaire

Outcome for Study 2
- Gross Motor Function Measure (GMFM 66 – B & C)15

GMFCS

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<tr>
<th>Probability17</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
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<td></td>
<td>± 10.5</td>
<td>± 10.5</td>
<td>± 8.4</td>
<td>± 8</td>
<td>± 8.9</td>
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Description of the measures used:
www.canchild.ca/eb/ourresearch/moveplay.asp

STUDY DESIGN & SAMPLE

- Retrospective studies
- Data collected from the Move & PLAY study10,11

Children between ages 18 months and 5 years who were included in the Move & PLAY study were included

Stud 1: N = 405
Stud 2: N = 365

OBJECTIVES

Study 1:
1. To develop the Body Function Index in Cerebral Palsy version I (BFI-CP I), using measures of primary and secondary impairments and associated health conditions using a simple summing technique
2. To develop the Body Function Index in Cerebral Palsy version II (BFI-CP II), by conducting a sophisticated cluster analysis on the measures of the primary and secondary impairments and health conditions
3. To explore the relationship between the BFI-CP versions I and II and the Gross Motor Function Classification System (GMFCS)

Study 2:
1. To investigate the association between the BFI-CP I and the outcome of change in motor function over a one-year period based on fifty percent probability that the children are developing ‘more poorly than expected’, ‘as expected’, or ‘better than expected’
2. To investigate the association between the BFI-CP II and the outcome of change in motor function over a one-year period based on fifty percent probability that the children are developing ‘more poorly than expected’, ‘as expected’, or ‘better than expected’
3. To investigate the association between the GMFCS and the outcome of change in motor function over a one-year period based on fifty percent probability that the children are developing ‘more poorly than expected’, ‘as expected’, or ‘better than expected’

STUDY 1

- Outcome for Study 2
- Classification of the GMFCS will be based on the method suggested by Hanna and colleagues

REFERENCES