Reviewer's report

Title: Unravelling Developmental Disregard in children with unilateral Cerebral Palsy by measuring Event Related Potentials during a simple and complex task

Version: 2 Date: 27 October 2013

Reviewer: Dido Green

Reviewer's report:

This study is well written and provides novel evidence of differential profiles of children with unilateral Cerebral Palsy (UCP) with and without clinically defined Developmental Disregard DD by measuring ERPs during simple and complex tasks. This study is an important contribution to our understanding of Developmental Disregard in (UCP).

The questions posed by the authors are well defined and clinically relevant, adhering to relevant standards for reporting and data deposition. I offer the following suggestions to improve the manuscript, especially to clarify some points of methodology and limitations of the study:

Major Compulsory Revisions

Introduction

In general this is well structured with the rationale and aims of the study clearly stated. This section would be bolstered by some changes and additional references to support some of the statements and discussion.

Para 1: statement of prevalence requires a reference referring specifically to rates of CP.

Paras 1 & 3: The authors may find the research reported by Sutcliffe and colleagues of relevance for discussions on defining/identifying DD and potential neural substrates (eg. cortical laterality) instead of references #2,3, & 6 used on page 4 para 2; none of these references directly studied neural substrates involved in motor control. (Sutcliffe TL, Logan WJ, Fehlings DL (2009) Pediatric Constraint-Induced Movement Therapy Is Associated With Increased Contralateral Cortical Activity on Functional Magnetic Resonance Imaging, Journal of Child Neurology Volume 24 Number 10 1230-35)

Para 5: The rationale for focussing on N1,P2 and N2,P3 latency components for cognitive load in motor tasks needs to be further elaborated. The authors may wish to include reference to a relatively recent review by Folstein and VanPetten (2008, Influence of cognitive control and mismatch on the N2 component of the ERP: A review Psychophysiology, 45 (2008), 152–170. Further discussion of the potential perceptual disorder accompanying UCP with DD could then be expanded.

Further points to consider in the introduction, which have implications for the methodology, are the longitudinal and nonlinear developmental trajectories (age

Methods

With respect to the above point and in view of variations in brain maturation by age and gender, some exploratory analysis of a potential interaction between gender and age is warranted. Please also include some information about severity of motor impairment either by MACS scores or a more specific breakdown of capacity of the affected hand and include in Table 1. It is notable that there were 3 children >10 years in the group without DD, all of whom were female whereas there was only one child over 10 years in the group with DD who was male. In view of the small numbers in both groups, partial correlations and or running of analyses with age and gender (and severity) as covariates would help control for a potential interactions.

Please provide some description or reference for the clinical measure used for classifying as DD or control and how this is distinguished from severity of motor impairment.

Design

Please provide further information regarding the actual motor response required in this section. It is unclear where the buttons were placed and whether it was possible to use one hand (less affected) to operate those on the right and left and or whether the dual-hand task required sequential, simultaneous or synchronised movements.

Page 10 – please confirm that the reaction time was calculated as an average or total RT for calculation of IES.

Please also confirm what constituted an error response – eg use of wrong hand or incorrect response to target/cue or background stimuli.

Results

Please consider report of age, gender and or severity as a covariate in the GLM model.

Discussion

This relates well to the results and applications to clinical practice clearly outlined. Further elaboration of developmental maturation of executive functions and potential for additional perceptual disorder in children with UCP and DD is warranted.

The limitations to the study should be set out more explicitly and in particular in relation to the small sample size and difficulties controlling for any interaction between gender and maturation with severity of motor impairment.
In summary – this paper provides novel results for considering the nature of developmental disregard of particular importance to researchers and clinicians.

Minor Essential Revisions

Table 1
Presumable V=female but please define.
Figure 3 – lease define what * refers to as has been done in Figure 2.
References – please change Supplement to Issue where relevant to avoid confusion.

**Level of interest:** An article of outstanding merit and interest in its field

**Quality of written English:** Acceptable

**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**
I declare that I have no competing interests.