

Poster presentation

Open Access

Neuropsychological benefits of computerized cognitive rehabilitation training in Ugandan children surviving cerebral malaria and children with HIV

Michael J Boivin*^{1,2}, Paul Bangirana³, Rachelle Tomac¹, Sujal Parikh², Robert Opika-Opoka⁴, Noeline Nakasujja³, Margaret Nakakeeto⁴, Chandy John⁵ and Bruno Giordani²

Address: ¹International Neurologic and Psychiatric Epidemiology Program (INPEP), Michigan State University, East Lansing, MI, USA, ²Neuropsychology Section, Department of Psychiatry, University of Michigan Medical School, Ann Arbor, MI, USA, ³Department of Psychiatry, Makerere University Medical School, Kampala, Uganda, ⁴Department of Paediatrics and Child Health, Makerere University Medical School, Kampala, Uganda and ⁵Global Pediatrics Program, Department of Pediatrics, University of Minnesota Medical School, Minneapolis, MN, USA

Email: Michael J Boivin* - michael.boivin@ht.msu.edu

* Corresponding author

from Infectious diseases of the nervous system: pathogenesis and worldwide impact
Paris, France. 10–13 September 2008

Published: 23 September 2008

BMC Proceedings 2008, 2(Suppl 1):P7

This abstract is available from: <http://www.biomedcentral.com/1753-6561/2/S1/P7>

© 2008 Boivin et al; licensee BioMed Central Ltd.

Background

The present study seeks to establish the feasibility of a computerized cognitive rehabilitation training (CCRT) program called Captain's Log, in order to improve attention and memory in Ugandan school children surviving cerebral malaria or with HIV. We also seek to establish the feasibility of a computerized neuropsychological assessment (CogState) to document CCRT neuropsychological benefit.

Methods

Sixty-five children (40 boys, 25 girls) surviving CM about 3 years earlier now 6 to 16 yrs of age ($M = 9.9$, $SD = 2.5$) were randomly assigned to CCRT intervention or to a non-intervention control group. CM CCRT consisted of 8 weeks of twice weekly Captain's Log training (<http://www.braintrain.com>) at Mulago Hospital, Uganda's national referral hospital. 60 children (24 boys, 36 girls) 6 to 16 years of age with HIV ($M = 9.8$, $SD = 2.8$) were randomly to CCRT treatment or a non-treatment control group. A third of these children were on ARV treatment. HIV CCRT consisted of 5 weeks of twice weekly Captain's Log training at the offices of Child Health Advocacy Inter-

national (CAI) in Kayunga town, a rural area 80 km east of Kampala. CAI provides home-based health care for these children (<http://www.childadvocacyinternational.co.uk/projects/uganda.htm>). CogState neuropsychological assessment (<http://www.cogstate.com>), a computerized 22 min neuropsychological screening test, was given before the start of training and again at the completion of training. CogState has few practice effects. Achenbach Child Behavior Checklist (CBCL) (<http://www.aseba.org/index.html>) was read to the principal caregiver to assess psychiatric symptoms for each study child. The CBCL was translated and back-translated into Luganda.

Results

a) In both the CM and HIV studies, the CCRT and Control groups had similar age, demographic, and neuropsychological scores before training. b) The children with CM in the CCRT intervention group had significantly greater improvement than the controls for CogState assessments on the Groton Maze Chase Task ($P = 0.001$) and Groton Maze Learning Task correct moves per second ($P = .001$). c) The CM CCRT group had greater improvements on

CBCL Internalizing Symptoms (Depression, Anxiety, Somatic Complaints) ($P = .027$). d) Consistent with the CM groups, the children with HIV in the CCRT intervention group also had significantly greater improvement than the controls on the Groton Maze Chase Task ($P = 0.034$) and Groton Maze Learning Task correct moves per second ($P = .013$). e) The HIV CCRT group did not show significant improvements compared to the controls on CBCL Internalizing or Externalizing symptoms. Only the CBCL post-test was administered.

Conclusion

We have established the feasibility of computer-based training and assessment programs in Ugandan children at risk from CNS infection. Subsequent clinical studies should evaluate CCRT along with internet-based games for learning, and internet games designed only for entertainment. This would help us better understand the key computer program ingredients for neuropsychological and psychosocial benefit.

Publish with **BioMed Central** and every scientist can read your work free of charge

"BioMed Central will be the most significant development for disseminating the results of biomedical research in our lifetime."

Sir Paul Nurse, Cancer Research UK

Your research papers will be:

- available free of charge to the entire biomedical community
- peer reviewed and published immediately upon acceptance
- cited in PubMed and archived on PubMed Central
- yours — you keep the copyright

Submit your manuscript here:
http://www.biomedcentral.com/info/publishing_adv.asp

