frontiers in PSYCHIATRY

Neuropsychiatric Imaging and Stimulation

ORIGINAL RESEARCH ARTICLE

Front. Psychiatry, 03 November 2014 | doi: 10.3389/fpsyt.2014.00141

Meta-analyses of developing brain function in high-risk and emerged bipolar disorder

Moon-Soo Lee[1,2], Purnima Anumagalla[1], Prasanth Talluri[1] and Mani N. Pavuluri[1]*

[1] Pediatric Brain Research and Intervention Center, University of Illinois at Chicago, Chicago, IL, USA
[2] College of Medicine, Korea University, Seoul, South Korea

Objectives: Identifying early markers of brain function among those at high risk (HR) for pediatric bipolar disorder (PBD) could serve as a screening measure when children and adolescents present with subsyndromal clinical symptoms prior to the conversion to bipolar disorder. Studies on the offspring of patients with bipolar disorder who are genetically at HR have each been limited in establishing a biomarker, while an analytic review in summarizing the findings offers an improvised opportunity toward that goal.

Methods: An activation likelihood estimation (ALE) meta-analysis of mixed cognitive and emotional activities using the GingerALE software from the BrainMap Project was completed. The meta-analysis of all fMRI studies contained a total of 29 reports and included PBD, HR, and typically developing (TD) groups.

Results: The HR group showed significantly greater activation relative to the TD group in the right DLPFC–insular–parietal–cerebellar regions. Similarly, the HR group exhibited greater activity in the right DLPFC and insula as well as the left cerebellum compared to patients with PBD. Patients with PBD, relative to TD, showed greater activation in regions of the right amygdala, parahippocampal gyrus, medial PFC, left ventral striatum, and cerebellum and lower activation in the right VLPFC and the DLPFC.

Conclusion: The HR population showed increased activity, presumably indicating greater compensatory deployment, in relation to both the TD and the PBD, in the key cognition and emotion-processing regions, such as the DLPFC, insula, and parietal cortex. In contrast, patients with PBD, relative to HR and TD, showed decreased activity, which could indicate a decreased effort in multiple PFC regions in addition to widespread subcortical abnormalities, which are suggestive of a more entrenched disease process.

TABLE OF CONTENTS

Keywords: pediatric bipolar disorder, high risk, meta-analysis, GingerALE, dorsolateral prefrontal cortex, amygdala

Citation: Lee M-S, Anumagalla P, Talluri P and Pavuluri MN (2014) Meta-analyses of developing brain function in high-risk and emerged bipolar disorder. *Front. Psychiatry* **5**:141. doi: 10.3389/fpsyt.2014.00141

Received: 10 June 2014; **Accepted:** 24 September 2014;
Published online: 03 November 2014.

Edited by: Stephanie Ameis, The Hospital for Sick Children and University of Toronto, Canada

Reviewed by: Meng-Chuan Lai, University of Cambridge, UK
Nicholas Neufeld, University of Toronto, Canada
Annette Beatrix Bruehl, University of Cambridge, UK

***Correspondence:** Mani N. Pavuluri, Pediatric Brain Research and Intervention Center, University of Illinois at Chicago, M/C 747, 1747 West Roosevelt Road, Chicago, IL 60608, USA e-mail: mpavuluri@psych.uic.edu

paradox

Guy Madison, Ulrika Aasa, John Wallert and Michael A. Woodley

Targeted NGS: A Cost-Effective Approach to Molecular Diagnosis of PIDs

Jennifer L. Stoddard, Julie E. Niemela, Thomas A. Fleisher and Sergio D. Rosenzweig

Chorusing, synchrony, and the evolutionary functions of rhythm

Andrea Ravignani, Daniel L. Bowling and W. Tecumseh Fitch

Mapping the Mechanisms of Transcranial Alternating Current Stimulation: A Pathway from Network Effects to Cognition

Ruairidh M. Battleday, Timothy Muller, Michael S. Clayton and Roi Cohen Kadosh

Altered dynamics between neural systems sub-serving decisions for unhealthy food

Qinghua He, Lin Xiao, Gui Xue, Savio Wong, Susan L. Ames, Bin Xie and Antoine Bechara

Learned stressor resistance requires extracellular signal-regulated kinase in the prefrontal cortex

John P. Christianson, Johanna G. Flyer-Adams, Robert C. Drugan, Jose Amat, Rachel A. Daut, Allison R. Foilb, Linda R. Watkins and Steven F. Maier

Biomarkers in Autism

Andre A. S. Goldani, Susan R. Downs, Felicia Widjaja, Brittany Lawton and Robert L. Hendren

Brain Structural Signatures of Negative Symptoms in Depression and Schizophrenia

Jie-Yu Chuang, Graham K. Murray, Antonio Metastasio, Nuria Segarra, Roger Tait, Jenny Spencer, Hisham Ziauddeen, Robert B. Dudas, Paul C. Fletcher and John Suckling

Unique Functional Abnormalities in Youth with Combined Marijuana Use and Depression: An fMRI Study

Kristen A. Ford, Michael Wammes, Richard W. Neufeld, Derek Mitchell, Jean Théberge, Peter Williamson and Elizabeth A. Osuch

Update on Molecular Pathology of Cutaneous Melanocytic Lesions: What is New in Diagnosis and Molecular Testing for Treatment?

Adriana C. H. van Engen-van Grunsven, Heidi Kusters-Vandevelde, Patricia J. T. A. Groenen and Willeke A. M. Blokx

Disentangling the Correlates of Drug Use in a Clinic and Community Sample: A Regression Analysis of the Associations between Drug Use, Years-of-School, Impulsivity, IQ, Working Memory, and Psychiatric Symptoms

Gene M. Heyman, Brian J. Dunn and Jason Mignone

Inpatient Cognitive Behavior Therapy for Adolescents with Anorexia Nervosa: Immediate and Longer-Term Effects

Riccardo Dalle Grave, Simona Calugi, Marwan El Ghoch, Maddalena Conti and

Christofer G. Fairburn

Identifying abnormal connectivity in patients using Dynamic Causal Modelling of fMRI responses.

Mohamed L Seghier, Peter Zeidman, Nicholas H Neufeld, Alex P Leff and Cathy Price

Three Decades of Research on O-GlcNAcylation – A Major Nutrient Sensor That Regulates Signaling, Transcription and Cellular Metabolism

Gerald W. Hart

Testis Cancer: Genes, Environment, Hormones

Alberto Ferlin and Carlo Foresta

Podocyte Dedifferentiation: A Specialized Process for a Specialized Cell

Carl James May, Moin Saleem and Gavin Iain Welsh

EPO Mediates Neurotrophic, Neuroprotective, Anti-Oxidant, and Anti-Apoptotic Effects via Downregulation of miR-451 and miR-885-5p in SH-SY5Y Neuron-Like Cells

Begum Alural, Gizem Ayna Duran, Kemal Ugur Tufekci, Jens Allmer, Zeynep Onkal, Dogan Tunali, Kursad Genc and Sermin Genc

Pathogenic Landscape of Transboundary Zoonotic Diseases in the Mexico-US Border Along the Rio Grande

Maria Dolores Esteve-Gassent, Adalberto A. Pérez de León, Dora Romero-Salas, Teresa P. Feria-Arroyo, Ramiro Patino, Ivan Castro-Arellano, Guadalupe Gordillo-Pérez, Allan Auclair, John Goolsby, Roger Ivan Rodriguez-Vivas and Jose Guillermo Estrada-Franco

Liver Diseases and Long Non-Coding RNAs: New Insight and Perspective

Luca Quagliata and Luigi M. Terracciano

Back to top