Abstract *Topic(s)*: Mood Disorders in Children and Adolescents; Novel Treatments

VitalSign6: screening, diagnosis and treatment of depression for adolescents presenting to pediatric primary and specialty care settings

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Abstract Body:

Aims: Revisions to guidelines recommend that pediatric primary care providers take a more active role in screening, diagnosing and treating depression (Cheung et al., 2018). Recent research suggests that 60% of depressed youth receive no treatment (CBHSQ, 2017). With primary care often serving as the only healthcare access point for youth, it is imperative that we implement systems to promote screening and treatment to improve outcomes.

Methods: VitalSign^6 (VS^6) is a web-based application that facilitates depression screening through measurement-based care (MBC) principles. It has been implemented as standard of care in over 24 clinics, including pediatrics, general practitioner/family medicine, and a pediatric psychiatry clinic. VS6 screens for depression, and includes tools for differential diagnosis, assessment of symptoms, and ongoing clinical decision support. Training and consultation with psychiatrists and psychologists is also available to clinics. Data reported reflects patients screened from October 2014 through May 2018. Remission is defined as a PHQ-9 score $\leq$5 at any time during the data collection period.

Results: A total of 3,021 youth were screened for depression, of which 670 (22.2%) screened positive, 375 (12.4%) were diagnosed with a depressive disorder, and 332 (11.0%) were entered into MBC. The remission rate is 24%, and the remission rate with at least one follow-up visit is 36%.

Conclusion: Findings indicate that VS6 is effective in supporting systematic screening, diagnosis and treatment for depressed youth. Clinics using the VS6 program had improved rates compared to the 6% national average for remission of depression in primary care.

Keywords: Depression; Pediatric Care; Measurement Based Care

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Weighted gene co-expression network analysis (WGCNA) of iPSC Generated from Patients with Schizophrenia

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Aims: Human induced pluripotent stem cells (hiPSC) have provided a new way of studying Schizophrenia (SZ), by allowing the establishment of cellular models accounting for the patient genetic background. Here we conducted an exploratory RNA-sequencing profiling study of different cell lines derived from hiPSCs generated from somatic cells of subjects from the population isolate of the Central Valley of Costa Rica (CVCR)

Methods: RNA from these cell were then sequenced using Illumina HiSeqTM2500. Raw count data measured 48162 transcripts across all samples. The 20000 more expressed genes were selected. Normalized values were used as input for weighted gene coexpression network analysis (WGCNA). Differential expression of MEs (module eigengene) comparing healthy controls and patients with schizophrenia across all cell types were performed.

Results and Conclusions: On total 4 cell lines (LCL, hiPSC, NPC and cortical neurons) of 6 healthy controls (HC) and 7 SZ patients from the CVCR were included on the WGCNA analysis. Biweight midcorrelation was used to define the coexpression similarity. Differential expression of MEs were observed on relation to phenotype and cell type. Mental disorders have a major impact on individual health, impairing both personal and professional activities, being therefore an important burden for society. Agreat advantage of using iPS-derived cells is that the effect of outside environmental influences, such as use of medications, is removed and only the effects of genetic composition, which is unchanged by transformation, are left. Our study use WGCNA to establish blocks of gene expression on a hiPSC cellular model of SZ related to phenotype. Several modules were significantly correlated with cell type study. When analyzing only hiPSC-neurons, modules correlated with the disease were identified.

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The future role of fMRI neurofeedback in depression treatment and research

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Aims: To summarise the evidence on fMRI-neurofeedback for major depressive disorder (MDD).

Methods: Systematic search for fMRI-neurofeedback trials in MDD, including our unpublished results.

Results: fMRI-neurofeedback reduced symptoms in MDD when reinforcing brain responses to positive pictures.[1] Reinforcing amygdala responses to positive autobiographical memories[2] was superior versus a control neurofeedback intervention.[3] We have developed neurofeedback of self-blame-selective functional connectivity between right superior anterior temporal (AT) and subgenual frontal regions. In remitted MDD, we demonstrated that self-esteem can be increased using this approach. In a recently completed trial in early treatment-resistant MDD, the majority of patients responded to guilt-related AT-subgenual connectivity neurofeedback. Surprisingly, a self-guided matched psychological intervention tackling self-blame without neurofeedback showed comparable levels of response. Secondary analyses, however, showed that neurofeedback was superior for those without anxious distress features.

Conclusions: This calls for longer-term studies to reproduce previous results and stratified trials to combine psychological and neurofeedback interventions. As a research tool, neurofeedback uncovers causal relationships between functions and anatomical subdivisions.

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