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PNIRS Virtual Meeting – 2021

Role of vascular function in early detection of posttraumatic stress disorder, and monitoring response to trauma-informed interventions

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Objectives: Posttraumatic stress disorder (PTSD) is a prevalent neuropsychiatric disorder in children and is associated with increased neurovascular inflammation, suicidality, adulthood mental health disorder, and major adverse events. This study will investigate the impact of vascular function in early detection, monitoring response to trauma-informed intervention, and outcome prediction in youth with PTSD. **Methods:** The interaction of PTSD with vascular dysfunction, the role of preserved vascular function with favorable outcome, and vascular function change in response to the trauma-informed intervention will be presented. **Results:** Vascular dysfunction is associated with the severity of reactivity to trauma reminders and core PTSD symptoms and predicts an increased mortality rate in those with PTSD. Preserved vascular function correlated with higher resilience, gratitude, wellbeing, and favorable long-term clinical outcome. Reminder-focused positive psychiatry is associated with improved vascular function and core PTSD symptoms. **Conclusions:** The severity of childhood PTSD is associated with impaired vascular function, which predicts increased adulthood cardiovascular mortality. Furthermore, positive biopsychosocial traits and interventions are associated with improved vascular function, reduced PTSD symptoms, and favorable clinical outcomes.

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The effect of reminder focused positive psychiatry suicide safety (RFPP-S) on COVID-19 related PTSD with PGD

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Objectives: Prolonged grief disorder (PGD) is prevalent and associated with increased psychiatric-comorbidities and suicidality. This study investigates the effect of Brief Reminder-Focused Positive Psychiatry and Suicide-Prevention (RFPP-S) in youth with COVID-19 related PTSD and PGD. **Methods:** 41 consecutive adolescents (ages 14 ± 4 years, 60% female) with COVID-19 related PTSD and PGD with SI received RFPP-S at the psychiatry-emergency-room (PER). RFPP-S consisted of 10-minute behavioral-modules, in 2 consecutive-days, on self-compassion, engagement, resilience, gratitude for traumatic/loss reminders with emotion regulation, distress tolerance, and safety planning skills. **Results:** The prevalence of youth PER visits was 61% higher in 2020. That constitutes 40% with COVID-19

related PTSD, with the presence of grief symptoms in over 90%. There was a significant reduction in Columbia suicide severity rate scale (C-SSRS), persistent complex bereavement disorder (PCBD) checklist, and PTSD reaction index in response to RFPP-S. Furthermore, RFPP-S is associated with an increase in wellbeing, resilience, parent-child interaction, school performance, post-discharge follow-up, and no PER visit/psychiatric-hospitalization 4-week after discharge. **Conclusions:** RFPP-S is associated with reducing PTSD and grief symptoms, acute psychiatric stabilization, parent-child interactions, and favorable outcome in youth with COVID-19 related PTSD and PGD.

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Psychological stress disrupts intestinal epithelial cell function and mucosal integrity through microbe and host-directed processes

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Background: Stress alters the gut microbiota and increases risk for bowel disease. Intestinal epithelial cells (IECs) maintain homeostatic interactions between the gut microbiota and its host. In this study, we hypothesized that inflammatory processes in IECs underly stress-induced disturbances to colonic homeostasis. **Methods:** Conventionally-raised (CONV-R) and germ-free (GF) mice were exposed to a social stressor (Str) to ascertain how stress modifies colonic IECs, the mucosal layer, and the gut microbiota. **Results:** RNA sequencing of IECs isolated from CONV-R mice revealed a robust pro-inflammatory (Saa1), pro-oxidative (Duox2), and antimicrobial (Reg3g) transcriptional profile as a result of Str. This response was concomitant to mucus thinning and endotoxemia. In contrast to CONV-R counterparts, IECs from GF mice exhibited no detectable Str-induced shifts in transcription. Still, IECs from Str-exposed GF mice responded to an ex vivo bacterial challenge with elevated expression of Dual Oxidase-2 (DUOX2), a hydrogen peroxide (H₂O₂) producing enzyme. Stress-induced IEC DUOX2 paralleled bacterial activity of catalase, an enzyme that detoxifies H₂O₂. **Conclusion:** Stress disrupts colonic epithelial cells and mucosal integrity, a response dependent on an intact microbiota and host signal priming. Epithelial cell ROS activity may represent a novel axis through which stress perturbs the gut microbiota and predisposes bowel infection.

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