

## MRI Findings in Preterm Infants Associated with Strabismus\*

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**OBJECTIVES/GOALS:** Prematurity and perinatal brain injury are known risk factors for strabismus. In this study, we sought to understand the link between neonatal neuroimaging measures in very preterm infants and the emergence of strabismus later in life. Study findings may inform if neonatal brain MRI could serve as a prognostic tool for this visual disorder. **METHODS/STUDY POPULATION:** This study draws from a longitudinal cohort of very preterm infants (VPT, < 30 weeks gestation, range 23 – 29 weeks) who underwent an MRI scan at 36 to 43 weeks postmenstrual age (PMA). Anatomic and diffusion MRI data were collected for each child. A subset of thirty-three patients in this cohort had records of an eye exam, which were reviewed for a history of strabismus. Patients with MRI scans demonstrating cystic periventricular leukomalacia or grade III/IV intraventricular hemorrhage were classified as having brain injury. Clinical variables with a known association to strabismus or diffusion metrics were included in a multivariable logistic regression model. Diffusion tractography metrics were screened for association with strabismus on univariable analysis prior to inclusion in the regression model. **RESULTS/ANTICIPATED RESULTS:** A total of 17/33 (51.5%) patients developed strabismus. A logistic regression model including gestational age, PMA at MRI, retinopathy of prematurity (ROP) stage, brain injury, and fractional anisotropy of the right optic radiation was significant at the .001 level according to the chi-square statistic. The model predicted 88% of responses correctly. Each decrease of 0.01 in the fractional anisotropy of the right optic radiation increased the odds of strabismus by a factor of 1.5 (95% CI 1.03 – 2.06;  $p = .03$ ). Patients with brain injury had 15.8 times higher odds of strabismus (95% CI 1.1 – 216.5;  $p = .04$ ). Gestational age (OR 1.7; 95% CI 0.9 – 3.3;  $p = .1$ ) and stage of ROP (OR 0.6; 95% CI 0.2 – 2.0;  $p = .4$ ) were not significant predictors of strabismus in the multivariable model. **DISCUSSION/SIGNIFICANCE:** Our findings suggest that strabismus in VPT patients may be related to specific changes in brain structure in the neonatal period. The identified association between neonatal optic radiation microstructure and strabismus supports the possibility of using brain MRI in very preterm infants to prognosticate visual and ocular morbidity.

416

## Identifying Biomarkers of Social Threat Sensitivity Associated with Social Anxiety and Depressive Symptoms in Adolescents\*

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**OBJECTIVES/GOALS:** Increases in anxiety and depression during adolescence may be related to increased biological reactivity to negative social feedback (i.e., social threat sensitivity). Our goal was to identify biomarkers of social threat sensitivity, which may provide unique etiological insight to inform early detection and intervention efforts. **METHODS/STUDY POPULATION:** Adolescents aged 12–14 ( $N=84$ ; 55% female; 80% White; 69% annual family income <\$70,000) were recruited. Youth viewed a series of happy, neutral, and angry faces while eye-tracking and electroencephalogram (EEG) data were recorded to capture cognitive and neural markers of sensitivity to social threat (i.e., an angry face). Fixation time and time to disengage from angry faces were derived from eye-tracking and event-related potentials were derived from EEG, which index rapid attention capture (P1), attention selection and discrimination (N170), and cognitive control (N2). Adolescents also completed a social stress task and provided salivary cortisol samples to assess endocrine reactivity. Social anxiety and depressive symptoms were self-reported concurrently and one year later. **RESULTS/ANTICIPATED RESULTS:** Latency to disengage from threatening faces was associated with lower N2 amplitudes (indexing poor cognitive control;  $r = -.24$ ,  $p = .03$ ) and higher concurrent social anxiety ( $r = .28$ ,  $p = .01$ ). Higher N170 amplitudes, reflecting attentional selection and discrimination in favor of threatening faces, predicted increases in depressive symptoms one year later ( $b = .88$ ,  $p = .02$ ). No other neurophysiological measures were associated with each other or with concurrent or prospective symptomatology. **DISCUSSION/SIGNIFICANCE:** Eye-tracking and EEG measures indexing difficulty disengaging from social threat and poor cognitive control may be biomarkers of social anxiety, which could be utilized as novel intervention targets. High N170 amplitudes to social threat, derived from EEG, may have clinical utility as a susceptibility/risk biomarker for depressive symptoms.

418

## The antiplatelet effects of EPA, an omega-3 fatty acid, are mediated by its 12-lipoxygenase metabolite, 12-HEPE

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**OBJECTIVES/GOALS:** To determine whether cardioprotective effects observed in individuals taking dietary supplementation with eicosapentaenoic acid (EPA), an  $\omega$ -3 polyunsaturated fatty acid, are realized by altering platelet function, and if these effects are mediated through the 12-lipoxygenase derived metabolite, 12-hydroxyeicosapentaenoic acid (12-HEPE). **METHODS/STUDY**