ELECTROPHYSIOLOGICAL EVIDENCE OF ALTERED VISUAL PROCESSING IN ADULTS WITH BLOCKED PATTERN VISION DURING INFANCY

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**BACKGROUND**
- Wiesel and Hubel discovered that binocular deprivation has dramatic results on the organization of the visual cortex in cats.\(^3\) In humans the effects of visual deprivation as a result of early cataracts and early surgical correction have been investigated using behavioural data\(^4\), but the EEG data from these patients has never been studied. While early visual development involves improvements in acuity, some visual capabilities, like face perception, continue to mature well beyond the first year after birth.\(^5\,\(^6\)
- In humans the system does not adapt to abnormal experience as a result of congenital cataracts and patients’ N170 and P100 components to faces were exaggerated showing late processing differences.\(^5\)

**CURRENT STUDY:** We investigated whether patients treated for corrected congenital cataracts differ from controls in the way they process visual information. By manipulating the complexity of the stimuli it was possible to inspect specific processing levels to determine where these differences lie.

**GOALS:** To discover where disruptions in visual processing arise from early visual deprivation.

**METHODS**
- **PATIENTS:**
  - 13 people born with dense bilateral cataracts that were removed within the first year after birth
  - Mean deprivation = 125 days; Ages 18-28 years at time of data collection
  - Controls:
    - Varied among 4 tasks - Ages (18-37)

- **EEG ACQUISITION & ANALYSIS:**
  - Continuous EEG collected using 128 or 256 Geodesic System
  - Offline 2-30 Hz bandpass filtered, re-referenced to 10-20 system
  - EEGlab was used to preprocess the data with automated artifact rejection; ICA used to reject biological artifacts
  - ERP components of interest were scored in ERPscore

- **RESULTS:**
  - **GLASS TASK**
    - Patients do not differentiate among stimuli; controls do
  - **TEXTURE TASK**
    - Patients do not differentiate among stimuli; controls do
  - **MOTION TASK**
    - Patients larger than controls; patients do not differentiate among stimuli; controls do

**REFERENCES**


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