Regional Cerebral Blood Flow in Self-Reported Anxiety in Adults versus Children

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Objective

The aim of this study is to identify regional Cerebral Blood Flow (rCBF) differences between adults and children with high levels of self-reported anxiety

Method

- Subjects were selected from two independent clinical outpatient databases for child and adult SPECT scans.
- Scores were standardized to T scores for each database. The highest 20% of self-reported anxiety was selected from each database.
- The final sample consisted of 3226 Adults [Mage=37.78, majority-white (68.7%) and male (54.7%)] and 545 children [Mage=13.58, majority-white (48.6%) and male (59.3%)]
- Significant differences existed between groups for gender and race.
- An ANCOVA was utilized to test the difference in concentration rCBF between adults and children controlling for these t covariates.

Results

Groups were compared across 17 variables representing different areas of the brain ($p<.05$)

- Children had significantly higher rCBF than adults in the following regions:
  - Limbic [left: $F(1,3767)=15.893$, $p<.001$ and right: $F(1,3767)=48.699$, $p<.001$]
  - Basal ganglia [left: $F(1,3767)=30.138$, $p<.001$ and right: $F(1,3767)=61.191$, $p<.001$]
  - Frontal [left: $F(1,3767)=142.244$, $p<.001$ and right: $F(1,3767)=112.273$, $p<.001$]
  - Motor sensory right $F(1,3767)=679.063$, $p=.008$
  - Vermis $F(1,3767)=50.025$, $p<.001$
- Adults had significantly higher rCBF than children in the following regions:
  - Parietal region [left: $F(1,3767)=42.235$, $p<.001$ and right: $F(1,3767)=82.708$, $p<.001$].

Discussion

There are significant differences in rCBF between children and adults with high self-reported levels of anxiety. This indicates that different neuronal mechanisms in adults and children are involved when experiencing high levels of anxiety. These findings can help clinicians better understand differences in how anxiety is expressed neurologically between children and adults.